

United States Department of the Interior
Bureau of Land Management

RANGELAND HEALTH ASSESSMENT AND EVALUATION REPORT

JUNIPER RANCH (NORTH) ALLOTMENT #01031

March 15, 2016

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



DRAFT

This page intentionally left blank.

TABLE OF CONTENTS

Allotment Information.....	1
Current Permitted Livestock Grazing Use.....	1
Allotment Profile.....	3
Climate	4
Grazing Management	5
Vegetation.....	9
Noxious and Invasive Weeds	10
Wildfire History.....	13
Monitoring/Study Data Summaries	16
Idaho Rangeland Health Standards Assessment.....	22
Standard 1 (Watersheds).....	26
Rangeland Health Assessment	26
Evaluation of Standard 1	30
Standard 2 (Riparian Areas & Wetlands).....	31
Standard 3 (Stream Channel/Floodplain)	31
Standard 4 (Native Plant Communities).....	31
Rangeland Health Assessment	31
Evaluation of Standard 4.....	34
Standard 5 (Seedings).....	34
Evaluation of Standard 5.....	41
Standard 6 (Exotic Plant Communities, Other than Seedings).....	44
Standard 7 (Water Quality).....	44
Standard 8 (Threatened, Endangered and BLM Sensitive Plants and Animals)	44
Rangeland Health Assessment	44
Evaluation of Standard 8.....	57
Literature Cited	59
Appendix A: Process for Generating Sage-grouse Habitat Assessment Framework Sample Sites...	63
Appendix B: Species List Accumulated During Upland Assessments	64

LIST OF TABLES

Table 1: Juniper Ranch (North) Allotment Acres	1
Table 2: Assessment Participants.....	1
Table 3: Land Ownership by Pasture in the Juniper Ranch Allotment.....	4
Table 4: Actual Use in the Juniper Ranch (North) Allotment 2004 – 2013.....	7
Table 5: Utilization in the Juniper Ranch North Allotment 2004 – 2013	8
Table 6: Vegetation Communities by Pasture (Acres).....	10
Table 7: Fire History In The Juniper Ranch North Allotment	14
Table 8. Summary of 2006 ESI and 2002 Production Data.....	17
Table 9: Frequency data from trend site 10S10E35 for Pasture 4	20
Table 10: Applicable Standards by Pasture	22
Table 11: Summary of 17 Rangeland Health Indicators.....	25
Table 12: Rangeland Health Attribute Rating by Site	26
Table 13: Percent ground cover (top layer) at IIRH/HAF sites	26
Table 14: Percent Ground Cover (Top Layer) at Other HAF Sites	27
Table 15: Percent Ground Cover (Top Layer) at ESI and Production Sites	27
Table 16: Vegetation Cover in Pasture 4 (HAF, HAF, Production Sites; Top Layer).....	32
Table 17: Percent Cover at 2010 and 2013 HAF/IIRH Sites (Top Layer).....	35
Table 18: Percent Cover at ESI, Production Sites, and HAF Sites (Top Layer).....	35
Table 19: Slickspot Peppergrass Potential Habitat (Acres)	46
Table 20: Sage-grouse Attendance at Occupied Leks Within Five Miles of Juniper Ranch North Allotment, 2000-2014.....	47
Table 21: Sage-grouse Habitat Assessment Worksheet for Nesting/Early Brood Rearing Habitat (Arid Site).....	50
Table 22: Ferruginous Hawk Nest Data.....	54
Table 23: Overall Habitat Suitability for BLM Sensitive Wildlife Species by Pasture.....	57

LIST OF FIGURES

Figure 1: Monthly Precipitation (2009 – 2013) at the Horse Butte RAWS Station.....	5
Figure 2: Average Spring Temperatures (2009 – 2013) at the Horse Butte RAWS Station.....	5

LIST OF MAPS

Map 1: Allotment Vicinity 2

Map 2: Range Infrastructure and Key Utilization Sites 3

Map 3: Vegetation Communities, 2006 Ecological Site Inventory (ESI) and 2002 Production Plots..... 11

Map 4: Noxious Weed Management 12

Map 5: Fire Frequency 15

Map 6: Upland Trend Monitoring Sites 21

Map 7: Idaho Indicators of Rangeland Health (IIRH) Sites 24

Map 8: Slickspot Peppergrass Potential Habitat and Area Surveyed 45

Map 9: Shrubland Habitat and Sage-grouse Leks 48

Map 10: Sage-grouse Habitat Assessment Framework (HAF) Sites 49

DRAFT

DRAFT

This page intentionally left blank.

ALLOTMENT INFORMATION

Field Office: Jarbidge Field Office (JFO)

Name of Permittees: Rafter J Grazing Association

Date of Field Assessment: May 30, 2013 & June 4, 2013

Stream Miles on Public Land: 0

Table 1: Juniper Ranch (North) Allotment Acres

Total Acres	BLM Acres	State Acres	Private Acres	Other Acres
16,224	15,561	663	0	0

Table 2: Assessment Participants

Name	Position
Jim Klott	JFO Wildlife Biologist
Michael Haney	JFO Wildlife Biologist
Dan Strickler	JFO Rangeland Management Specialist
Julie Hilty	Fuels Specialist
Elena Shaw	District Resource Coordinator

CURRENT PERMITTED LIVESTOCK GRAZING USE

Total Active Use: 1,207 Animal Unit Months (AUMs) (1,187 Cattle and 20 Horse AUMs)

Livestock Type: Cattle, Horses

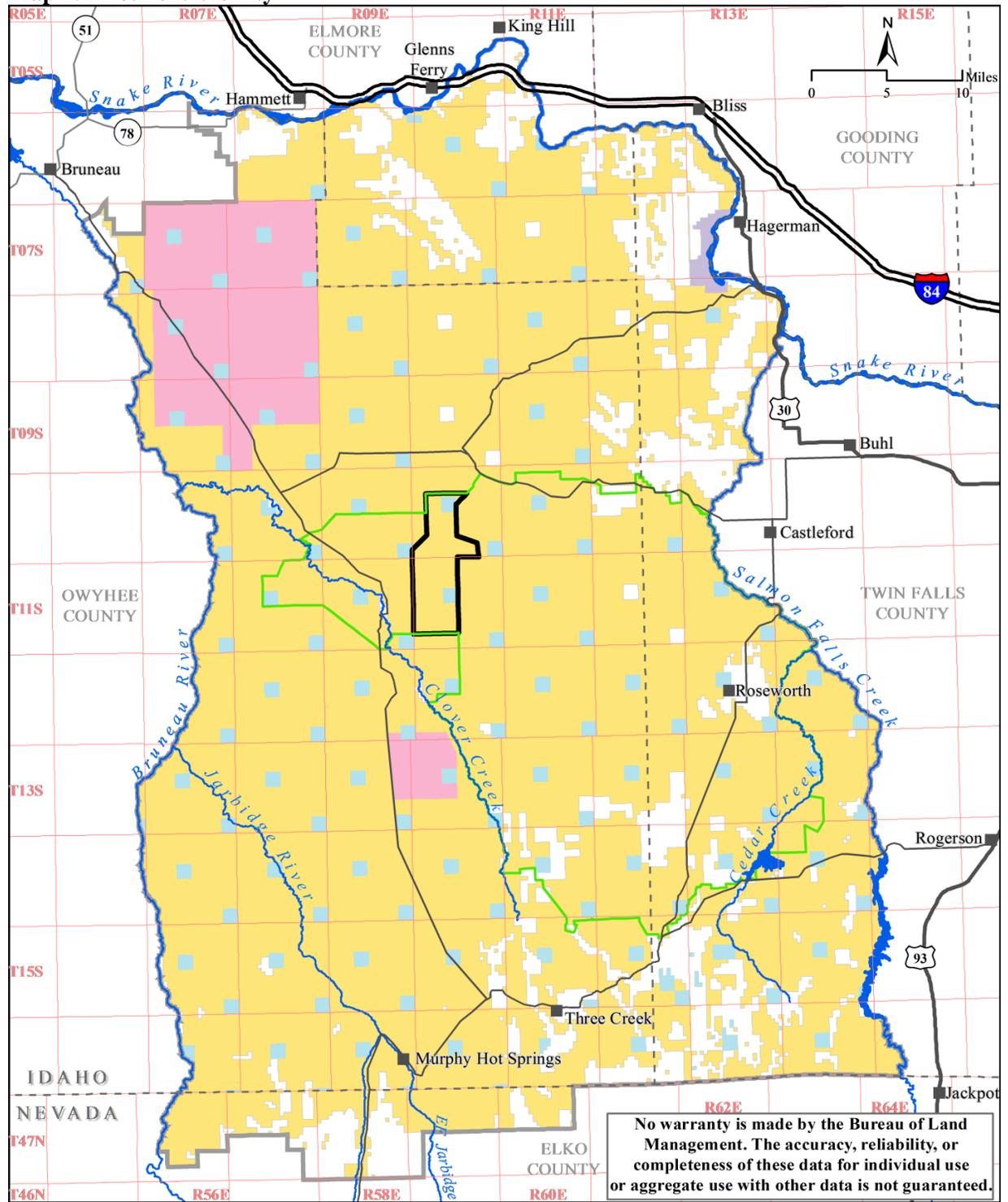
Livestock Numbers: 148 Cattle, 5 Horses

Season of Use: 04/01 to 11/30

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

Current BLM Stocking Level: 12.9 Acres/AUM

Map 1: Allotment Vicinity

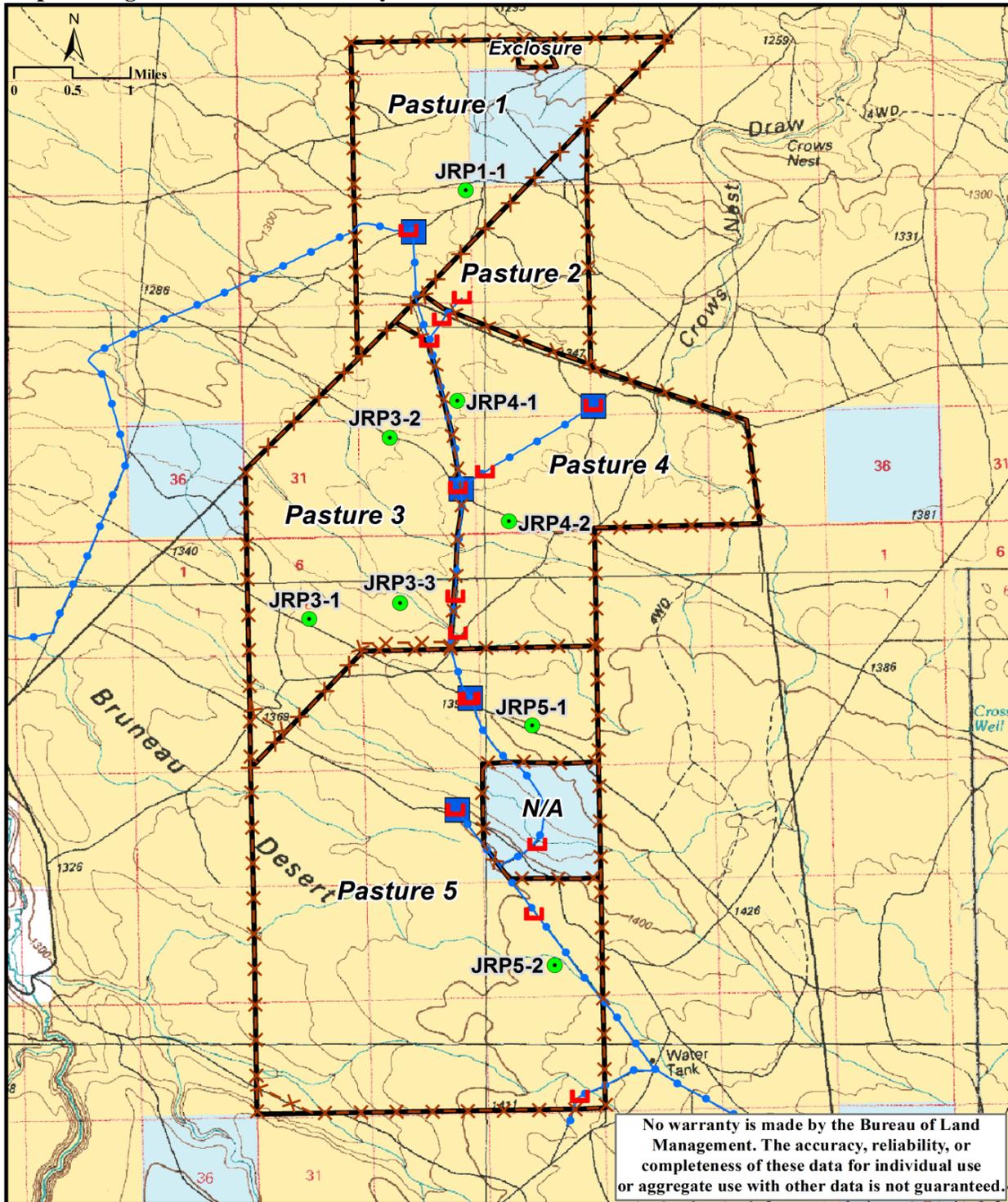


No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

	Juniper Ranch North Allotment		Bureau of Land Management		Private; other
	Devil Creek Sub-region		Military, Department of Defense		State
			National Park Service		

Map projection:
UTM zone 11
NAD 1983

Map 2: Range Infrastructure and Key Utilization Sites



ALLOTMENT PROFILE

The Juniper Ranch Allotment consists of 16 pastures with mixed ownership (BLM, State of Idaho, and private lands). In 2010, the previous permittee’s estate was settled with the permitted AUMs split and transferred to two heirs. As a result the Juniper Ranch Allotment was split into two use areas: North (Pastures 1, 2, 3, 4, 5) and South (Pastures 6, 7, 8, 9, 10, 11, 11B, 12, 13, Riparian, and Lower Riparian. This Rangeland Health Assessment is for the North use area, hereinafter referred to as the Juniper Ranch North Allotment.

The Juniper Ranch North Allotment is located approximately 22 miles west of Castleford, Idaho (Map 1). The allotment has flat to rolling topography. The elevation ranges from approximately 4,360 to 5,460 feet.

Twenty-nine miles of fence form the exterior boundaries of the Juniper Ranch North Allotment. About 11 miles of four-strand barbed wire fence splits the allotment into five pastures (Map 2). Cattle have been authorized to graze the allotment throughout the year. About nine miles of pipeline provides livestock water to the Juniper Ranch North Allotment. There are 13 troughs along the pipeline as well as five storage tanks (Map 2). A playa in the northeast part of Pasture 5 also intermittently provides water for livestock. Land ownership by pasture is shown in Table 1. There is no private land within the Juniper Ranch North Allotment.

Table 3: Land Ownership by Pasture in the Juniper Ranch Allotment

Allotment Name	Pasture	Land Ownership (Acres)*		
		Public	State	Total
Juniper Ranch North	1^	1,851	561	2,412
	2	908	80	988
	3	2,959	0	2,959
	4	3,167	0	3,167
	5	6,676	22	6,698
Allotment Total^		15,561	663	16,224

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

^A 43 acre enclosure in Pasture 1 is included in the acreage.

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 Juniper Ranch North 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 2009 to 2013 in the Juniper Ranch North Allotment. The RAWS station is located in an 8 to 12 inch precipitation zone approximately three miles southeast of the Juniper Ranch North Allotment. The 30-year annual average precipitation at the Horse Butte RAWS station is 8 inches.

Average monthly precipitation at the station was below the thirty-year average during 2012 and 2013 (Figure 1). Total rainfall in 2012 was 4.89” and in 2013 it was 4.52”. Rainfall was near or above the thirty-year average in 2009, 2010 and 2011. Figure 2 shows the 30-year monthly average air temperature.

Figure 1: Monthly Precipitation (2009 – 2013) at the Horse Butte RAWs Station

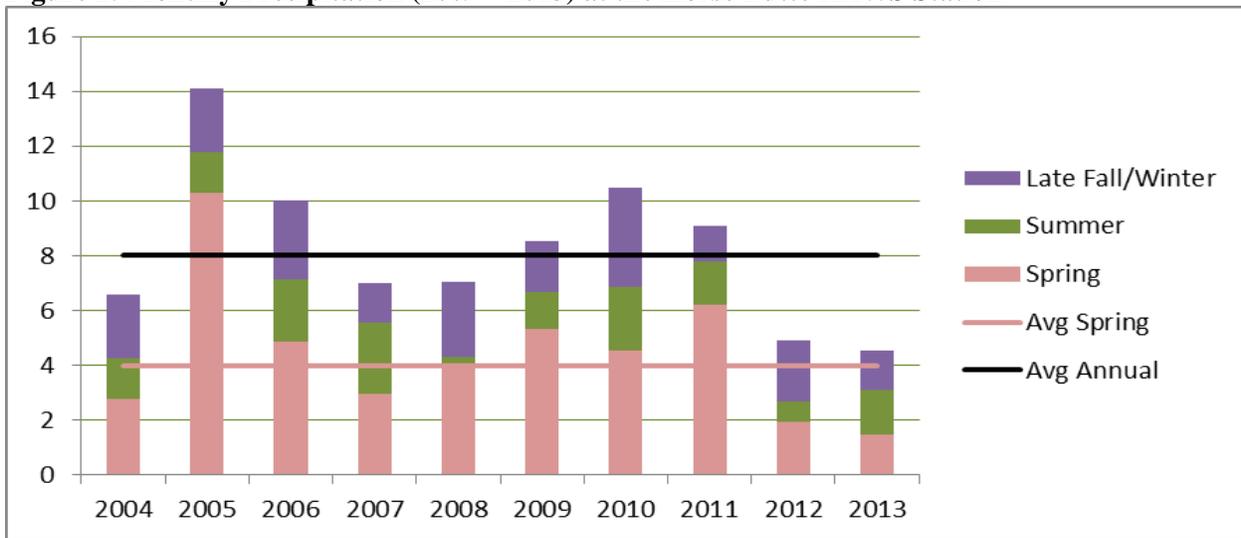
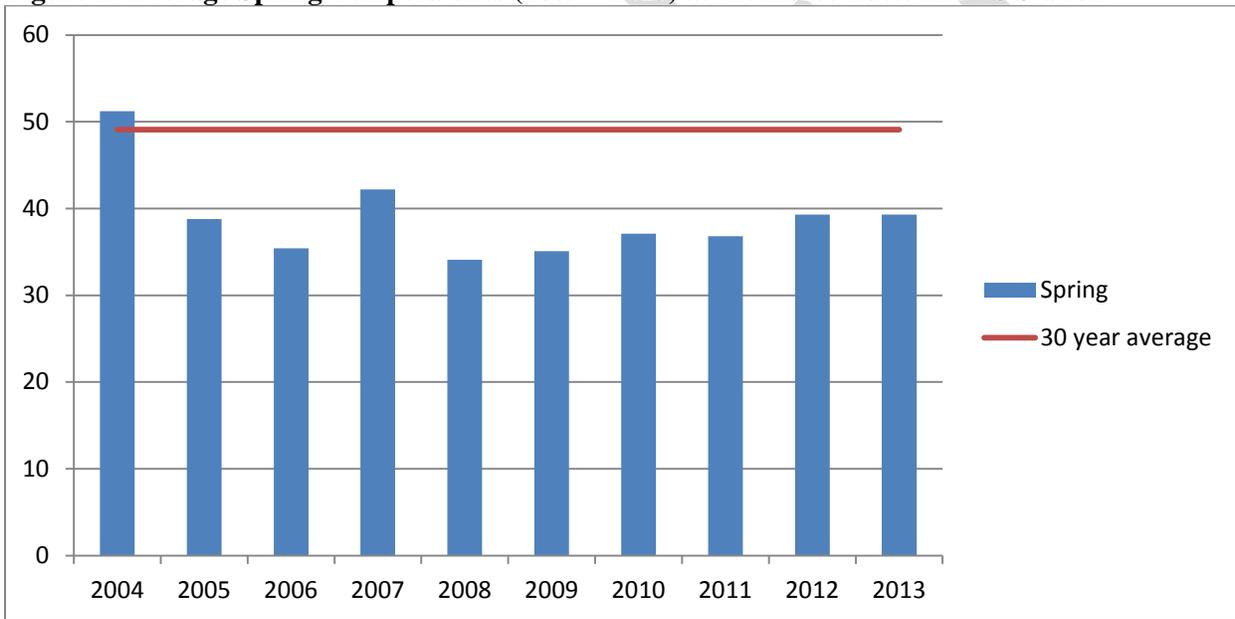


Figure 2: Average Spring Temperatures (2009 – 2013) at the Horse Butte RAWs Station



Grazing Management

The grazing permit for the Juniper Ranch North Allotment transferred to different livestock operations three times within the last ten years. Livestock management has also changed during this time. Prior to 2011, a minimum of three herds of cattle grazed the allotment. The herds were kept separate during the time they were in the allotment. There was also no formal grazing system rotating cattle through the allotment. After the allotment was split into two use areas, two herds grazed in the allotment during 2011 and one herd used the Juniper Ranch North Allotment in 2012 and 2013.

Rafter J Grazing Association currently holds the active grazing permit in the Juniper Ranch North Allotment. Livestock grazing is permitted in the allotment from April 1 to November 30. Active permitted use in the northern use area is 1,207 Animal Unit Months (AUMs).

Currently, the Juniper Ranch North Allotment is subject to Chief U. S. District Judge B. Lynn Winmill's Decision and Order of February 26, 2009. The court order directs the Bureau of Land Management (BLM) to adjust livestock grazing to maintain and enhance sage-grouse, pygmy rabbit, and slickspot peppergrass habitats. To comply with Judge Winmill's order livestock grazing in each pasture identified as providing sage-grouse habitat would be deferred in the spring (March 1 through June 1). Three pastures were originally identified for sage-grouse management: Pastures 3, 4, and 5. However, habitat in Pastures 3 and 5 burned in wildfires eliminating most of the sagebrush in these two pastures. The livestock permittee also agreed to implement a rest-rotation grazing system in 2009 and an Annual Grazing Agreement describing livestock management within the Juniper Ranch Allotment is developed each year. The agreement identifies how the allotment will be managed so to comply with the court order, including changing the season livestock are authorized to graze the allotment as well as how cattle are rotated through pastures.

In addition to the permitted active use, BLM can authorize the Wells Juniper Ranch Grazing Association to trail livestock through the Juniper Ranch North Allotment. In 2011, the Wells Juniper Ranch Grazing Association filed an application with the JFO to trail 400 cattle through the Juniper Ranch North Allotment. Cattle may be trailed through Pastures 1 and 3 following the main road from Clover Creek to Crow's Nest Junction. Trailing livestock through the allotment is dependent on transportation costs, or if fall weather inhibits trucking of livestock from the Juniper Ranch South Allotment. The Wells Juniper Ranch Grazing Association has not trailed cattle through this allotment since submitting their application. Additional details about trailing are found in the Livestock Trailing Environmental Assessment DOI-BLM-ID-T010-2012-0004-EA.

BLM authorized TNR annually until 2004, when a Federal District Court order disallowed Temporary Non-Renewable (TNR) authorizations in the Jarbidge Field Office. Since 2005, Congressional Appropriations language has allowed the Jarbidge Field Office to annually authorize TNR when additional forage is available up to the allotment's highest TNR authorization between 1997 and 2003. The Appropriations Act allows the Jarbidge Field Office to authorize up to 1,657 AUMs in the entire Juniper Ranch Allotment. When the allotment was divided into two use areas, TNR AUMs were divided allowing up to 795 TNR AUMs in the Juniper Ranch (North) Allotment. Actual use values that exceed the active permitted use are TNR AUMs.

Livestock Actual Use and Utilization

Permitted active AUMs in the Juniper Ranch North Allotment are 1,207. Twenty AUMs are designated for horses, and the remaining 1,187 are cattle AUMs. The horse AUMs were not used over the ten year study period. The grazing permit was transferred in 2003, 2007, and again in 2010. Actual use data is available for most years; however, data for 2004, 2005, 2006, and 2007 did not identify use by pasture. Actual use data is shown in Table 4.

From 2004 to 2006 three herds were grazed simultaneously on the entire Juniper Ranch Allotment. TNR was authorized in 2005 (73 AUMs) and 2006 (388 AUMs); however, it is not evident which pastures TNR AUMs was allowed since actual use was not documented by pasture. Livestock grazing occurred from April 1 to mid-November in 2004 and 2006, and from May 1 to December 5 in 2005.

The Juniper Ranch Allotment was not yet split into two use areas during 2007 to 2010, but actual use was reported by pasture except for in 2008. Actual use averaged 1702 in 2007, 2009, and 2010 in Pastures 1 through 5. Two herds of cattle used the northern portion of the allotment from April to mid-November; one herd used Pasture 5 while the other herd used at least 3 of the other 4 pastures during the grazing year. TNR AUMs were issued in all four years; however, it is not evident where TNR was allowed in 2007 and 2008 by pasture. TNR AUMs were authorized in Pastures 1, 3, and 5 in 2009 and Pastures 2 and 4 in 2010.

Table 4: Actual Use in the Juniper Ranch (North) Allotment 2004 – 2013

Year	Pastures	Season of Use	AUMs
2004	1, 2, 3, 5 and north portion of 4	Data is not identified by Pasture and is shown as total AUMs for the entire Juniper Ranch Allotment.	
2005 & 2006	Data is not identified by Pasture in these years and is shown as total AUMs for the entire Juniper Ranch Allotment. TNR AUMs were authorized but not known in which pastures.		
2007	2 and 4	04/11 – 10/28	952
	3	04/15 – 07/03	407
	5	07/04 – 11/01	617
2008	Data is not identified by Pasture and is shown as total AUMs for the entire Juniper Ranch Allotment. TNR AUMs were authorized but not known in which pastures.		
2009	5	04/10 – 7/10	390
		10/17 – 11/10	141 [^]
	1	04/10 – 06/01	218*
		10/29 – 11/13	74 [^]
	4	06/02 – 07/15	202
	3	07/16 – 10/01	359
10/02 - 10/28		124 [^]	
2010	4	4/10 – 06/03	237
	4	10/17 – 11/18	168 [^]
	1	06/03 – 08/05	303*
	3	08/06 – 10/16	367
	2	10/07 – 11/29	228 [^]
	5	04/01 – 07/09	553
2011	2	03/24 – 04/02	364
	3	04/23 – 05/26	443
	5	05/27 – 06/30	456
	1 and 4	01/01 – 02/28	740 [^]
2012	3	03/01 – 04/27	337
	1	04/28 – 06/18	225
	5	03/01 – 05/25	466
		12/11 – 12/27	157
		12/28 – 02/28	648 [^]
	2	04/28 – 06/18	25
2013	1	03/15 – 06/07	443
	3	03/15 – 05/27	350
	4	06/01 – 06/15	9
	5	12/02 – 12/28	262
		12/29 – 02/28	669 [^]

*128 Exchange of Use AUMs included in actual use.

[^]TNR AUMs

Beginning in 2011, the Juniper Ranch Allotment was split into two separate use areas. Cattle use in the allotment changed after 2011. Cattle grazed in the allotment early spring to early summer (March through June) and winter use (December through February). Most of the use during the winter was authorized as TNR AUMs. In 2011 and 2012 two cattle herds grazed the northern use area during the spring. TNR AUMs averaged 686 AUMs and were authorized in Pastures 1 and 4 in 2011 and in Pasture 5 during 2012 and 2013.

The Jarbidge Field Office staff used the Height-Weight Method (Cooperative Extension Service et al., 1999) to collect utilization data on crested wheatgrass (*Agropyron cristatum*), ‘Secar’ Snake River wheatgrass (*Elymus wawawaiensis*), and Thurber’s needlegrass (*Achnatherum thurberianum*). Utilization data collected in 2004 and 2005 was collected at random sites 2005. In 2006 permanent utilization sites were established in each pasture. Utilization data are shown in Table 5 and locations of key utilization sites are shown on Map 2.

Table 5: Utilization in the Juniper Ranch North Allotment 2004 – 2013

Pasture	Year	Site	Percent Utilization		
			Crested Wheatgrass	Thurber’s Needlegrass	‘Secar’ Snake River Wheatgrass
1	2005	*	24	-	-
	2006	JRP1_1	-	35	-
	2009	JRP1_1	31	-	-
	2010	JRP1_1	27	-	-
	2011	JRP1_1	6	-	-
	2012	JRP1_1	18	-	-
	2013	JRP1_1	29	-	-
2	2004	*	37	-	-
3	2004	*	30	-	-
		*	49	-	-
	2006	JRP3_1	31	43	-
		JRP3_2	54	-	-
	2007	JRP3_1	24	-	-
		JRP3_2	27	-	-
		JRP3_3	33	-	-
	2009	JRP3_1	31	-	-
		JRP3_2	17	-	-
		JRP3_3	35	-	-
	2010	JRP3_1	28	-	-
	2011	JRP3_1	-	4	-
		JRP3_3	5	-	-
2012	JRP3_1	-	6	-	
4	2004	*	-	20	-
		*	-	16	-
	2006	JRP4_1	-	36	-
		JRP4_2	-	21	-
	2007	JRP4_1^	-	31	-
		JRP4_2	-	22	-
	2008	JRP4_1	-	34	-
		JRP4_2	-	32	-
	2009	JRP4_1	-	13	-
		JRP4_2	-	10	-
2010	JRP4_2	-	5	-	
2011	JRP4_2	-	5	-	
2013	JRP4_1	-	3	-	
5	2004	*	-	29	-
		*	21	-	-
		*	-	17	-
	2006	JRP5_1	-	44	-

Pasture	Year	Site	Percent Utilization		
			Crested Wheatgrass	Thurber's Needlegrass	'Secar' Snake River Wheatgrass
	2007	JRP5_1	-	52	-
		JRP5_2	-	6	11
	2008	JRP5_1	-	56	-
	2009	JRP5_1	-	48	-
	2009	JRP5_2	-	-	31
	2010	JRP1_1	-	-	14
	2011	JRP5_2	-	-	7
	2013	JRP5_2	-	-	16

*Data not collected at a designated site, sites established in 2006.

- A dash denotes utilization data was not collected

^ Plot JRP4_1 was relocated in 2007 because a fence was built through the middle of it.

Utilization was mostly measured on crested wheatgrass in Pastures 1 and 3. Utilization in Pasture 1 was typically slight (0 to 20 percent) to light (21 to 40 percent), ranging from 6 percent to 31 percent. Use in Pasture 3 was mostly light with moderate use (41 to 60 percent) occurring in two years. Utilization ranged from 5 percent to 54 percent over the ten-year study period. Data was only collected once in Pasture 2 and measured light use on crested wheatgrass.

Utilization was measured on Thurber's needlegrass in Pasture 4 and on Thurber's needlegrass and 'Secar' Snake River wheatgrass in Pasture 5. Use ranged from slight to light (3 to 36 percent) on Thurber's needlegrass in Pasture 4 and on 'Secar' Snake River wheatgrass in Pasture 5, and slight to moderate use on Thurber's needlegrass in Pasture 5. Moderate use on Thurber's needlegrass occurred in 4 consecutive years (2006 to 2009) of the ten-year study period. Pasture 5 burned in 2007, and was subsequently seeded to 'Secar' Snake River wheatgrass. After 2009, utilization data was only collected on 'Secar' Snake River wheatgrass in Pasture 5. Utilization data was also sporadically collected on a few other grass species (squirreltail, Sandberg bluegrass) throughout the allotment and was less than 20 percent.

Vegetation

Plant communities within the planning area were mapped in 2006 using field observations, field cover data, and National Agriculture Imagery Program (NAIP). Updates to the map occurred in 2013 using more recent field observations and NAIP imagery. The Field Office classified and mapped vegetation communities based on dominant plant cover using a minimum mapping unit of 20-acres. This scale is appropriate for landscape-level planning but is not intended to show the complexity of vegetation communities at a finer-scale. Fifty-three vegetation communities were mapped based on dominant plant cover. These vegetation communities were organized into five classes and six sub-classes according to national standards (Grossman et al., 1998), with the exception of shrublands dominated by sagebrush. Sagebrush (*Artemisia spp.*) dominated shrublands are defined as having 10 percent or more shrub cover. The criteria of 10 percent or more shrub cover provide consistency with defined habitat needs for greater sage-grouse (Wisdom et al., 2000).

Currently, crested wheatgrass and 'Secar' Snake River wheatgrass seedings are the dominant plant communities in the Juniper Ranch North Allotment (Table 6, Map 3). These plant communities are a result of wildfire and subsequent rehabilitation efforts. Rehabilitation efforts have included drill and aerial seedings, as well as chemical treatments since 1957 (Clover Road Fire). Portions of the allotment were drill seeded following the 1957 Clover Road Fire, 1982 Crows Nest Fire, 1985 Crows Nest Fire, 1995 Clover Complex Fire (Tuanna), 1999 Doe Fire, 2000 Crimson and Clover Fire, and 2006 Sailor Cap Fire. Aerial seedings occurred within the allotment following the 1995 Clover Complex Fire, 1999 Doe Fire, 2000 Crimson and Clover Fire, 2002 Big Crow Fire, 2006 Sailor Cap Fire, and 2010 Long Butte Fire. The

allotment is currently vegetated by both native and non-native perennial grass species, with the majority of the allotment lacking sagebrush cover.

Table 6: Vegetation Communities by Pasture (Acres)

Vegetation Community*	Pasture 1	Pasture 2	Pasture 3	Pasture 4	Pasture 5
Crested Wheatgrass	1,464	0	1,938	1,329	2,354
Sandberg Bluegrass (<i>Poa Secunda</i>)	204	0	345	1,117	0
Wyoming Big Sagebrush (<i>Artemisia tridentata wyomingensis</i>)/ Sandberg bluegrass	0	0	396	636	643
Wyoming Big Sagebrush/ Thurber's Needlegrass	0	0	0	25	474
'Secar' Snake River Wheatgrass	0	0	0	0	2,687
Annual	121	0	280	5	522
Barren	15	0	0	0	0
Recent Burn^	4	908	0	55	0

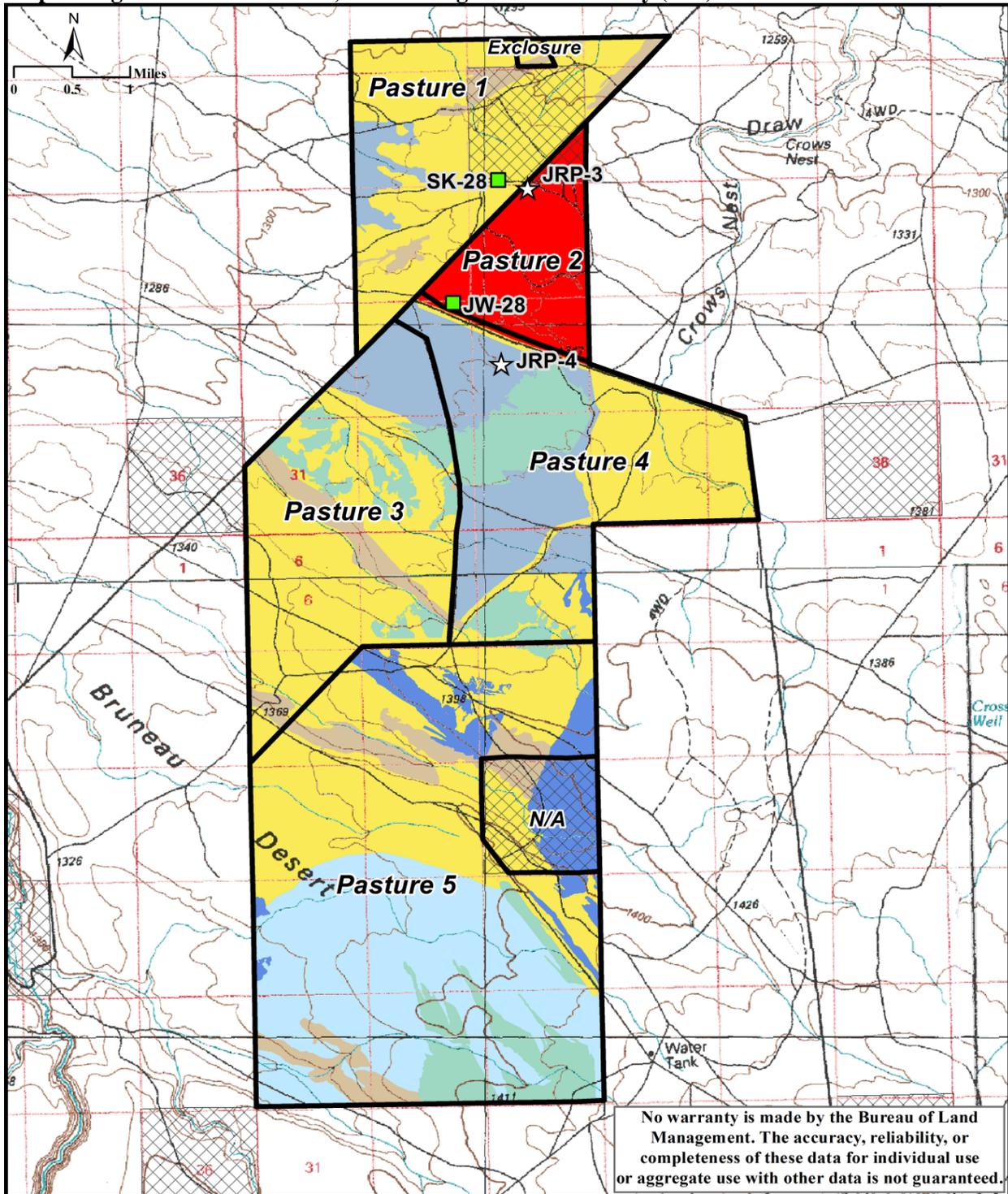
* Vegetation community is listed by dominate cover species. Numerous other plant species, both native and non-native, are present in the communities.

^Areas classified as Recent Burn are areas that have burned in the last 2 years and have not been reevaluated for vegetation community classification.

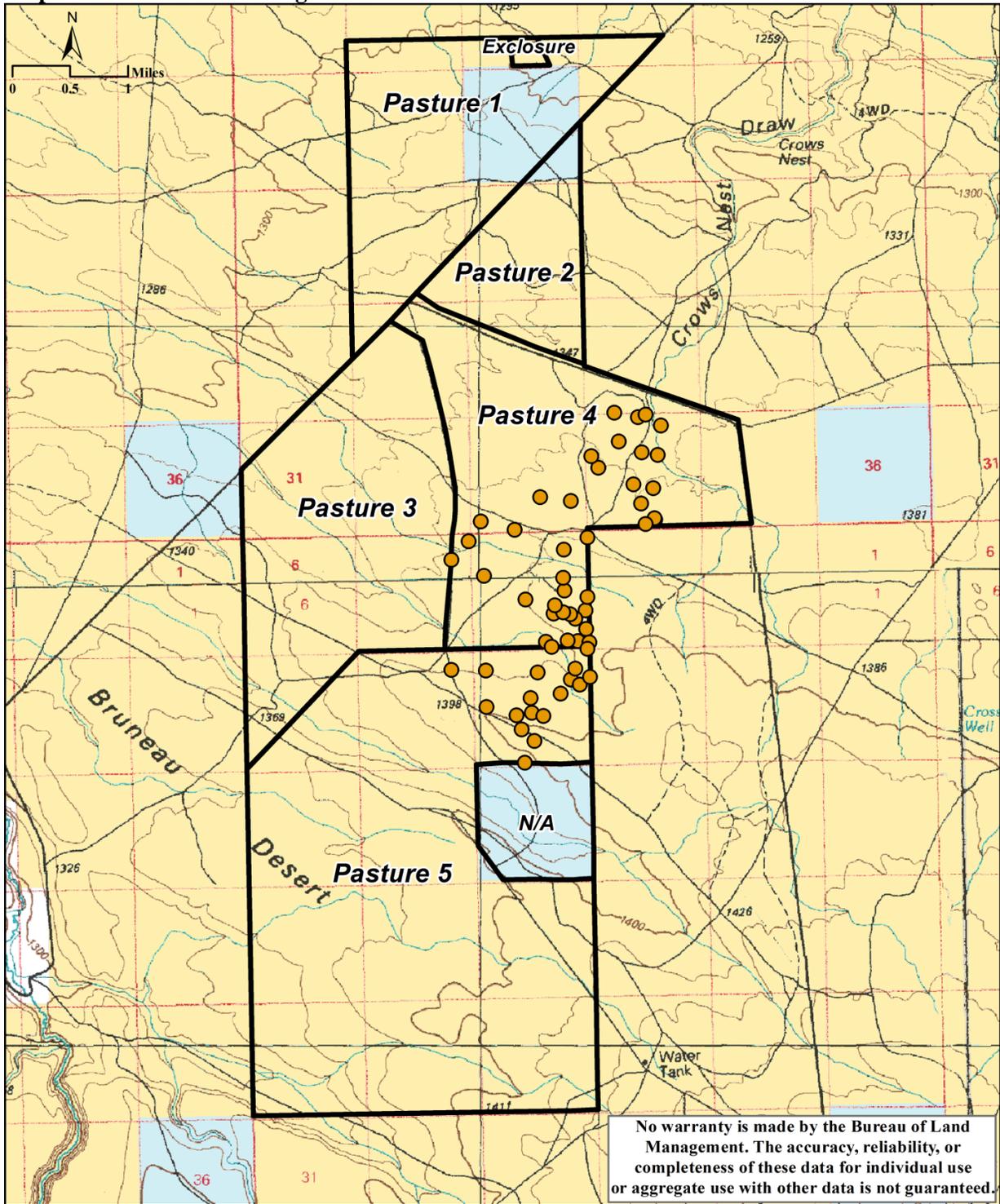
Noxious and Invasive Weeds

The State of Idaho has listed 66 plant species as noxious weeds. Rush skeleton weed (*Chondrilla juncea*) is the only noxious weed to occur in the Juniper Ranch North Allotment. There are 57 known rush skeletons occurrences in the allotment, with 41 in Pasture 4 and 16 in Pasture 5 (Map 4). All of these occurrences were chemically treated in the past. Treatment goals are to reduce noxious weeds so they do not significantly impact the economy or environment or to eradicate them completely. The BLM also works to prevent the establishment of new species and occurrences in areas where they presently do not occur.

Map 3: Vegetation Communities, 2006 Ecological Site Inventory (ESI) and 2002 Production Plots



Map 4: Noxious Weed Management



Wildfire History

The Juniper Ranch North Allotment historically contained sagebrush-steppe vegetation dominated by Wyoming big sagebrush plant communities. Vegetation has changed in the allotment over the past several years. Perennial grasses dominate some areas in the allotment due to wildfire and subsequent post-fire seeding. Fifteen wildfires burned in the allotment since 1957, with about half occurring in the last 20 years (Table 7). Approximately 80 percent of the Juniper Ranch North Allotment has burned at least once in the last 20 years, and portions of some pastures have burned two to four times in the last twenty years (Map 5).

Wildfires had the primary effect of removing sagebrush cover. Drill seedings to re-establish herbaceous vegetation and compete with cheatgrass often occurred post-fire. Aerial seedings to reestablish sagebrush and forbs also occurred, primarily in the last 20 years. Some chemical treatments occurred to control noxious weeds and invasive annual plants. A detailed discussion of post-fire ESR treatments is presented below. Unless otherwise stated, no post-fire ESR information is available for fires listed in Table 7.

Areas burned before the 1995 Tuanna Fire were drill seeded with cultivars of crested wheatgrass. This included the 1979, 1982, and 1985 Crows Nest fires, and the 1985 Crossroads Fire. Fourwing saltbrush (*Atriplex canescens*) was added to the 1979 Crows Nest Fire seed mix; alfalfa (*Medicago sativa*) was added to the drill mix or aerial seeded in 1982 and 1985. Starting in 1995 with the Tuanna Fire, seed mixes were diversified with native grass cultivars, forbs, and sagebrush. Burned areas in the Tuanna Fire were drill seeded with crested wheatgrass and 'Secar' Snake River wheatgrass was added to the seed mix in Pasture 5. All burned areas in this fire were aerially seeded with Wyoming big sagebrush, yellow sweetclover (*Melilotus officinalis*), and 'Ladak' alfalfa.

Burned areas in the 1999 Doe Fire were drill seeded with 'Secar' Snake River wheatgrass, 'Critana' thickspike wheatgrass (*Elymus lanceolatus*), 'Arriba' western wheatgrass (*Pascopyrum smithii*), 'Trailhead' basin wildrye (*Leymus cinereus*), and 'Eski' sainfoin (*Onobrychis viciifolia*). The burned areas were also aerial seeded with Wyoming sagebrush, 'Appar' Lewis flax (*Linum lewisi*), and 'Delar' small burnett (*Sanguisorba minor*).

Following the 2000 Crimson and Clover Fire, the burned portions of Pasture 3 were treated with the chemical Oust to control cheatgrass. The northern portion of the burned area in Pasture 1 was drill seeded with 'Secar' Snake River wheatgrass, 'Critana' thickspike wheatgrass, and fourwing saltbrush. Portions of the burned areas in Pastures 1, 2 and 4 were aerially seeded with Sandberg bluegrass, 'Ladak' alfalfa, western yarrow (*Achillea millefolium*), and Wyoming big sagebrush.

No drill seeding occurred after the 2002 Big Crow Fire. The burned area was aerial seeded with 'Ladak' alfalfa, western yarrow, and Wyoming big sagebrush.

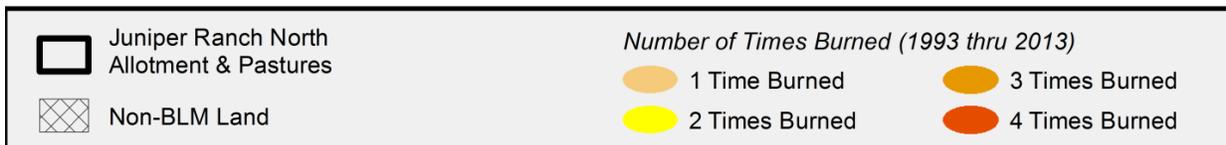
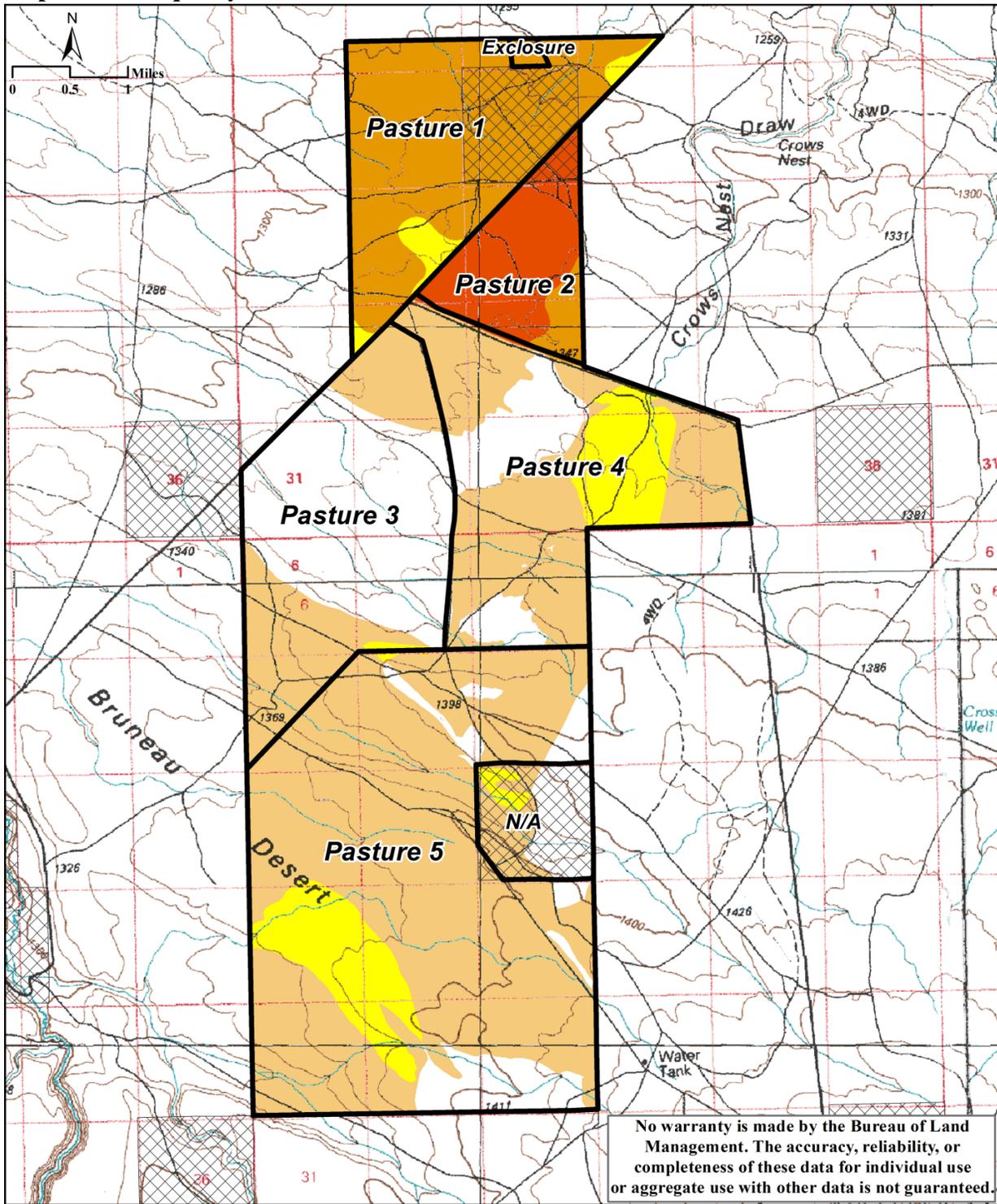
Portions of areas burned in Pastures 2 and 4 by the 2006 Sailor Cap Fire were drill seeded with Sandberg bluegrass, 'Anatone' bluebunch wheatgrass, bottlebrush squirreltail, 'Trailhead' basin wildrye, 'Appar' Lewis flax, 'Eski' sainfoin, and Munroe globemallow (*Sphaeralcea munroana*). All areas burned in the Sailor Cap Fire were aerially seeded with Wyoming big sagebrush.

No drill seeding occurred after the 2007 Elk Mountain, 2010 Long Butte, or 2012 Kinyon Road fires due to these areas being seeded before the fires. The area burned by the 2010 Long Butte Fire was aerial seeded in strips at 50 percent coverage with Wyoming big sagebrush. No sagebrush seeding occurred in this allotment in 2007 or 2012. In 2012, after the Kinyon Road Fire, areas that burned were not reseeded to sagebrush since seed was not available due to high regional seed demands.

Table 7: Fire History in the Juniper Ranch North Allotment

Fire Year	Fire Name	Pasture	Acres Burned	Percent of Pasture
1957	Clover Road	3	1,730	58
		4	165	5
1973	Crows Nest	1	120	6
1979	Crows Nest	1	1,040	43
		2	865	88
1981	Clover	3	565	19
1982	Crows Nest	1	205	8
		3	80	3
1985	Crossroads	3	290	10
		4	76	2
1985	Crows Nest	1	2,350	97
		3	2,595	88
		4	530	17
1995	Tuanna (Clover Complex)	3	740	25
		5	4,406	66
1999	Doe	5	1,585	24
2000	Crimson and Clover	1	2,330	97
		2	840	85
		3	355	12
		4	465	15
2002	Big Crow	4	1,625	51
		5	755	11
2006	Sailor Cap	1	2,365	98
		2	990	100
		4	1,100	35
2007	Elk Mountain (Murphy Complex)	1	23	1
		2	985	99
		4	50	2
2010	Long Butte	1	2,235	93
2012	Kinyon Road	1	55	3
		2	985	2
		4	75	2

Map 5: Fire Frequency



Monitoring/Study Data Summaries

ESI Data

Plant production data collected in 2002 and 2006 (ESI inventory) was measured in pounds/acre (dry weight). BLM crews collected data in Pastures 1 and 2 in 2006 and Pastures 2 and 4 in 2002. Production data is shown in Table 8. Map 3 displays ESI and production site locations.

Both the ESI sites (SK28 and JW28) and Production Site JRP-3 burned in 2006. ESI Site SK-28 (Pasture 1) burned again in 2010. Production Site JRP-3 (Pasture 2) and ESI Site JW-28 (Pasture 2) also burned in 2007 and 2012. Recent data from these sites/plots has not been collected.

All the sites are on a Loamy 8-12" Wyoming big sagebrush/bluebunch wheatgrass (*Pseudoroegneria spicata*) – Thurber's needlegrass ecological site. Expected total production for this ecological site ranges from 400 pounds per acre in an unfavorable (below average precipitation) year to 900 pounds per acre in a favorable (above average) year. In 2002 production ranged from 1365 to 1877 pounds/acre (Table 8). Crested wheatgrass provided most of the production at 1812 pounds/acre. Production ranged from 302 to 756 pounds per acre in 2006 (Table 8). Spring precipitation was above the thirty year average in 2006 so it likely did not influence the low production at Site SK-28. The site is located in between a water trough and pasture fence. It is fairly centered between the two features, about 0.1 miles from each. Although utilization data is not available, livestock likely congregate within this area when coming in for a drink of water and may have influenced overall production at this site.

The data indicates perennial grass production is either within the range of production of reference condition (USDA and NRCS, 2013a) or exceeds the range, with crested wheatgrass replacing bluebunch wheatgrass as the dominant bunchgrass at all sites except for Site JRP-4. Thurber's needlegrass remains the dominate grass at this site. Sandberg bluegrass exceeded its upper production at all sites except for Site JRP-3. Based on production data crested wheatgrass heavily dominates this site. Cheatgrass was present at all sites except for JRP-3 (Pasture 2) and was particularly high at Site SK-28 (Pasture 1). Bluebunch wheatgrass was not recorded at any of the sites.

Perennial forb production was below the reference plant community's range of production at most of the sites. Forb production exceeded its upper production at Site JRP-4. Long-leaf phlox provided the bulk of the production at 229 pounds/acre. It also was recorded at two of the other plots. Also recorded at Site JRP-4, but at lesser amounts were tapertip hawksbeard (*Crepis acuminata*) and Western yarrow. Annual forb production included prickly lettuce (*Lactuca serriola*), tall annual willowherb (*Epilobium brachycarpum*), tumbled mustard (*Sisymbrium altissimum*), and yellow salsify (*Tragopogon dubius*). Most of the annual forbs are weedy species with most occurring in minimal amounts. Tumbled mustard (Site JRP-4) amounts were high in 2002, which was likely influenced by the 2000 Crimson and Clover Fire.

Both annual and spring precipitation was above the 30-year average in 2006 (Figure 1). Spring precipitation was below the average in 2002, with most rain coming in June. Data collection occurred in mid to late June. Although precipitation was low in 2002, considering the timing of data collections and above average precipitation amounts in 2006, overall native forb production is below its potential for this ecological site.

Wyoming big sagebrush was found at three sites. Total shrub production was minimal at all three sites. Past and recent wildfires has reduced or eliminated shrubs at all four sites.

Production data shows vegetation has changed in the allotment. The plant community is not as diverse as the reference plant community. Total plant production is similar or exceeds the upper range; however,

grass species, primarily crested wheatgrass, provides most of the total plant production. Wildfire and past vegetation treatments have influenced this change in vegetation.

Table 8: Summary of 2006 ESI and 2002 Production Data

Vegetation Class	Plant Species	Loamy 8-12" (Wyoming big sagebrush/bluebunch wheatgrass-Thurber's needlegrass) / ESD Reference Sheet #R011XY001ID*				
		Reference Plant Community	2006 ESI		2002 Production	
			SK-28 Pasture 1	JW-28 Pasture 2	JRP-3 Pasture 2	JRP-4 Pasture 4
Perennial Grasses	Sandberg Bluegrass	20 – 45	64	87	13	134
	Crested Wheatgrass	0	380	176	1,812	0
	Squirreltail (<i>Elymus elymoides</i>)	20 – 45	0	0	2	95
	Bluebunch Wheatgrass	100 – 250	0	0	0	0
	Thurber's Needlegrass	8 – 180	0	0	0	648
	Other Native Grasses (5 species)^	0 – 110	0	0	0	0
	Total Perennial Grasses	220 – 450	444	263	1825	877
Annual Grasses	Cheatgrass (<i>Bromus tectorum</i>)	0	240	0	20	59
	Sixweeks Fescue (<i>Vulpia octoflora</i>)	0	2	0	0	0
	Total Annual Grasses°	-	242	0	20	59
Perennial Forbs	Arrowleaf balsamroot (<i>Balsamorhiza sagittata</i>)	10 – 25	0	0	0	0
	Tapertip hawksbeard	1 – 25	0	0	0	5
	Spiny phlox (<i>Phlox hoodii</i>)	0 – 5	0	0	0	0
	Longleaf phlox (<i>Phlox longifolia</i>)	0 – 5	0	8	14	229
	Fleabane (<i>Erigeron</i>)	0 – 5	0	2	0	0
	Western yarrow	0 – 5	0	0	0	25
	Other Native Perennial Forbs (17 species) ^	0 – 100	0	0	0	0
	Total Perennial Forbs	60 – 175	0	10	14	259
Annual Forbs	Prickly lettuce	0	0	0	0	2
	Tall annual willowherb	0	0	8	0	0
	Tumblemustard	0	70	2	10	195
	Yellow salsify	0	0	0	7	0
	Total Annual Forbs°	-	70	10	17	197
Shrubs	Wyoming big sagebrush	100 – 225	0	19	0	3
Shrubs	Other Native Shrubs (10 species) ^	0 – 105	0	0	1*	0
	Total Shrubs	120 – 275	0	19	1	3
TOTAL		400 – 900	756	302	1877	1365

^ Other grasses, forbs and shrub are those species that individually occur in small amounts but collectively contribute to the site's overall production. (Refer to Reference Sheet #R011BY001ID for a full list of plants occurring in the reference plant community.)

°ESD does not include annual grass or forb production.

*Total Dry Weight expressed as pounds per acre

Upland Trend Monitoring

Four upland trend monitoring sites were established in 1988; however, three of these sites had to be abandoned, and reestablished in a new location (Map 6). The newly established sites only have one year of data and cannot be used to determine trend. Consequently only data from one site (10S10E35, Pasture 4) can be analyzed for trend. Both nested plot frequency and 3x3 photo plots were read. Nested plot frequency records the frequency of plant species while plant cover is recorded in the 3x3 photo plots. All changes in plant frequency described below are statistically significant unless otherwise noted.

Factors limiting the comparison of trend data over time include: 1) data was not always collected at the same time of the year; 2) not all forbs were recorded by genus and species; 3) Annual forbs were not always noted; 4) microbiotic crusts were not always noted when the plots were established; 5) inconsistencies between persons reading the 3x3 photo plots over the years. Trend data information can be reviewed at the Jarbidge Field Office.

Several disturbances have significantly altered Site 10S10E35 over the past several years. In 1992, a greenstrip was established through a portion of the site and in 2006, the site burned in the Sailor Cap Fire and was subsequently drill seeded with a mix of Sandberg bluegrass, "Anatone" bluebunch wheatgrass, squirreltail, Trailhead basin wildrye, Appar Lewis flax, Eski sainfoin, and Munroe globemallow. The burned area was also aerial seeded with Wyoming big sagebrush. These disturbances obscure any other potential effects to the site between 1992 and 2006. Consequently, significant changes at the site prior to 2008 are assumed to be a result of these disturbances.

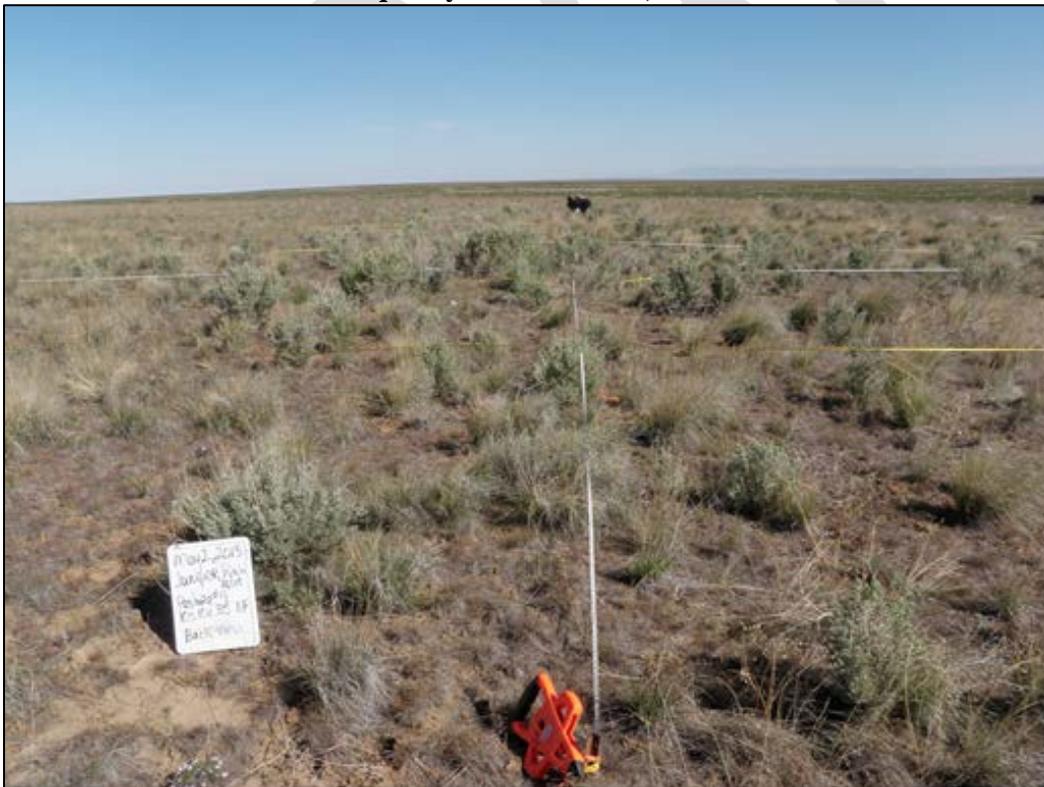
Trend site 10S10E35 is on a loamy 8-10" Wyoming big sagebrush/bluebunch wheatgrass-Thurber's needlegrass ecological site. The trend site was established in 1988. Both nested plot frequency and a 3x3 photo plot are at the site. The area is currently mapped as a crested wheatgrass seeding. However, crested wheatgrass was seeded in a greenstrip not throughout the area. Further the area was seeded after the 2006 Sailor Cap Fire. The seed mixture did not contain crested wheatgrass but rather Anatone bluebunch wheatgrass. Thurber's needlegrass, Sandberg bluegrass, and Wyoming big sagebrush also occur at the site.

Nested plot frequency was initially read at Site 10S10E35 in 1988, with the 3x3 photo plot read for the first time in 1994. Data was collected in 1988, 1994, 2008, and 2013 (Table 9). The key species is Thurber's needlegrass. The frequency of Thurber's needlegrass declined significantly (47 percent to 12 percent) from 1988 to 2013. Squirreltail frequency also declined from 46 percent to 2 percent during this same time period. Crested wheatgrass increased from 26 percent to 55 percent between 2008 and 2013. It was first recorded in 2008 after being seeded in 1992 for a greenstrip. Cheatgrass also increased from 30 percent to 59 percent from 2008 to 2013. 'Anatone' bluebunch wheatgrass was first recorded in 2013. Total forb frequency is static. Changes in vegetation from 1989 to 2013 are displayed Photos 1 and 2.

Photo 1: 1988 Nested Plot Frequency Site 10S10E35, Pasture 4



Photo 2: 2013 Nested Plot Frequency Site 10S10E35, Pasture 4



The decline in Thurber’s needlegrass and squirreltail from 1988 to 1994 likely resulted from a greenstrip that was planted through a portion of the site, which was disked and then seeded to crested wheatgrass. Crested wheatgrass was first recorded in 1994, after the greenstrip was planted and correlates with the decline in Thurber’s needlegrass. Thurber’s needlegrass declines from 1994 to 2008 are likely a result of the 2006 Sailor Cap Wildfire. A study done in southern Idaho resulted in either a high mortality rate for Thurber’s needlegrass or extensive damage to the plants from summer wildfires (Wright and Klemmedson, 1965). Post-fire recovery of Thurber’s is slow (Volland and Dell, 1981) and plant vigor may be reduced for several years after being burned (Bunting, 1985). The reason for the decline in squirreltail is not obvious as squirreltail is typically tolerant of fire.

Photos and data from 2008 show the changes in vegetation following a wildfire. More weedy plant species are present and sagebrush is drastically reduced. Weedy plant species included tumbled mustard, clasping pepperweed (*Lepidium perfoliatum*), prickly lettuce, and cheatgrass. Prior to this time no weedy species were recorded. Except for cheatgrass, none of these plants were recorded in 2013; however, curvseed butterwort (*Ceratocephala testiculata*) was recorded at trace levels.

Table 9: Frequency data from trend site 10S10E35 for Pasture 4

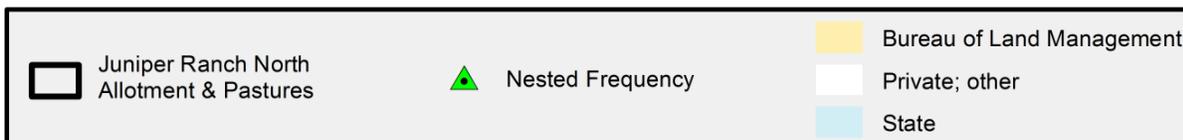
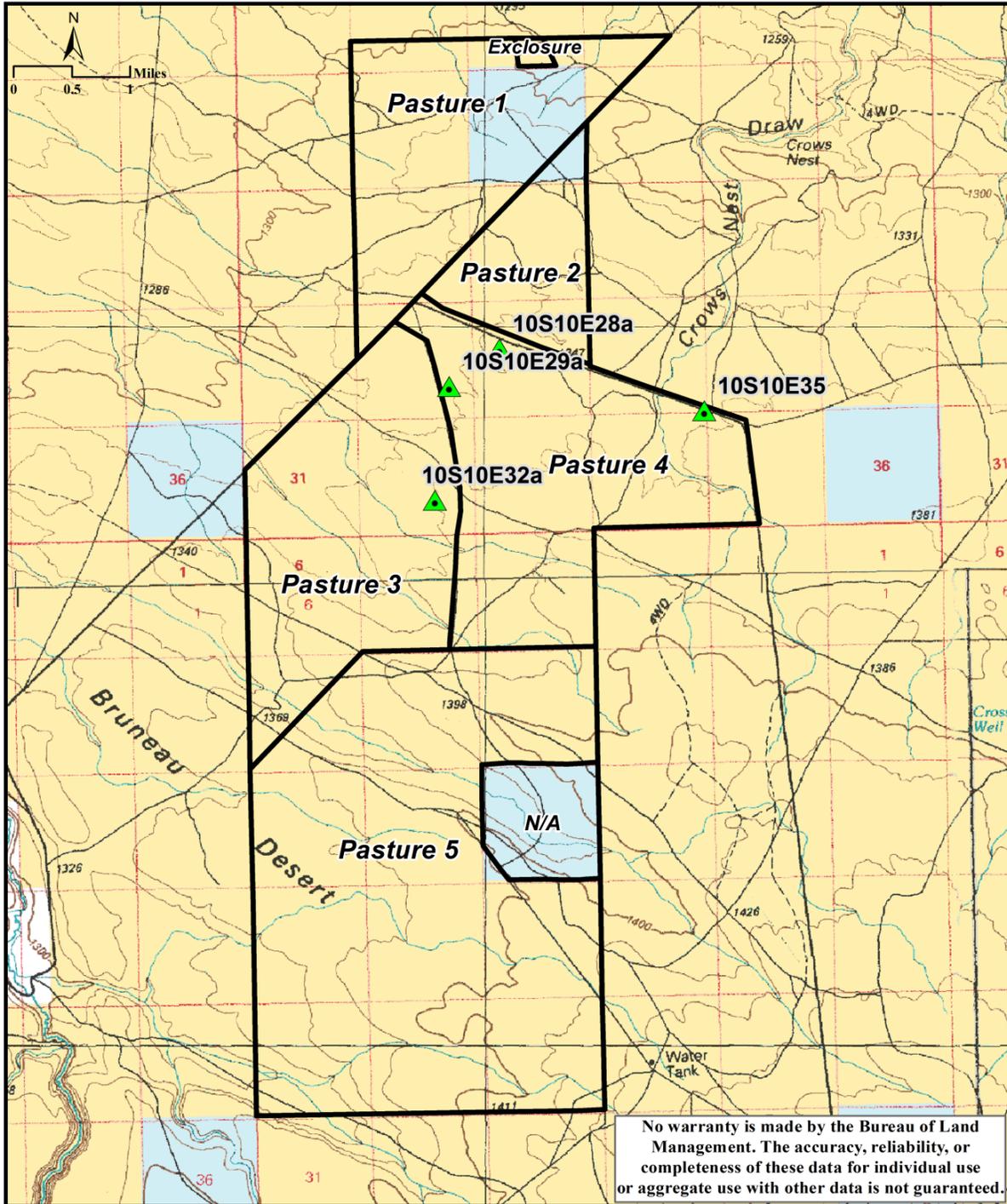
Species *	Plot	Percent Frequency			
		1988	1994 [^]	2008	2013
Thurber’s needlegrass	3	47	34	4	12
Squirreltail	3	46	28	4	2
Crested wheatgrass	4	0	26	37	55
‘Anatone’ bluebunch wheatgrass (seeded in 2006)	4	0	0	0	12
Sandberg bluegrass	1	29	22	21	64
Cheatgrass	2	0	0	30	59
Wyoming big sagebrush	4	39	29	7	5

*Frequency for individual forb species not shown due to variability in plant identification among crews and timing of data collection.

[^]In 1992 a greenstrip seeding was planted through the plot. Crested wheatgrass was in the greenstrip seed mix.

One mature Thurber’s needlegrass plant was recorded in the 3x3 photo plot in 1994. In 2008 eight plants were recorded and seven were recorded in 2013. Sandberg bluegrass plants have also increased over time (33 plants to 50 plants). Litter declined in 2008 and increased in 2013 as would be expected several years post fire. Curvseed butterwort was not recorded in the 3x3 plot and cheatgrass cover was recorded at 1 percent. Live vegetation cover increased while bare ground decreased.

Map 6: Upland Trend Monitoring Sites



IDAHO RANGELAND HEALTH STANDARDS ASSESSMENT

There are eight standards for rangeland health that apply to BLM lands in the state of Idaho. Not all of the Standards apply to the Juniper Ranch North Allotment due to variances in the land type and geographical area. Of the eight Idaho Standards for Rangeland Health, the following standards are applicable to the Juniper Ranch North Allotment (Table 10):

- **Standard 1** – Watersheds provide for the proper infiltration, retention, and release of water appropriate to soil type, vegetation, climate, and landform to provide for proper nutrient cycling, hydrologic cycling, and energy flow.
- **Standard 4** - Healthy, productive, and diverse native animal habitat and populations of native plants are maintained or promoted as appropriate to soil type, climate, and landform to provide for proper nutrient cycling, hydrologic cycling, and energy flow.
- **Standard 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 2, 3, 6, and 7 do not apply to the Juniper Ranch North Allotment.*

Table 10: Applicable Standards by Pasture

Standard	Pastures
1	All Pastures
4	Pasture 4
5	Pastures 1, 2, 3, 5
8	All Pastures

An interdisciplinary (ID) team conducted IIRH field evaluations at four sites in the Juniper Ranch North Allotment in May and June 2014. One site each was located in Pastures 1, 3, 4, and 5. A site was not done in Pasture 2 since the site in Pasture 1 also represented Pasture 2. Three sites are in seedings (Pastures 1, 3, 5) and one site is in a native plant community (Pasture 4). All of the IIRH evaluation sites are in the same spots as the HAF sites (Map 7). HAF sites were randomly selected through GIS using criteria specific to sage-grouse habitat requirements (Appendix A).

Using IIRH, the ID team evaluated three attributes: Soil and Site Stability, Hydrologic Function, and Biotic Integrity (Pellant et al., 2005). The ID team completed an IIRH sheet, took photographs, recorded plant species, and took field notes at each site. Field notes provide more details helping to better describe the indicators and any resulting departures from the ecological site reference condition.

Vegetation cover data collected during the HAF assessments is also used for the IIRH evaluation. The line point intercept method was used to collect vegetation cover data at the HAF sites (BLM, 2010). Daubenmire frames were used in addition to the line point intercept method to count the number of forbs within frames. Forb species were recorded in a 7.9 inches by 19.7 inches (0.1 m²) Daubenmire frames were placed at each point along the line intercept. This resulted in more comprehensive data on forb species diversity than could be obtained by the line point intercept alone.

Natural Resource Conservation Service ecological site description (ESD) reference sheets were used to compare reference conditions to current plant and soil characteristics of the IIRH site and decide whether ecological processes are adequately functioning. The ESD describes the characteristics of the ecological site in its reference state as well as the transitional reference states that can occur on the site.

All of the IIRH sites are on a Loamy 8 to 12", Wyoming big sagebrush/bluebunch wheatgrass – Thurber's needlegrass ecological site #R011XY001ID (NRCS, 2013a). The reference plant community has Wyoming big sagebrush in the overstory with bluebunch wheatgrass and Thurber's needle grass dominating the understory. Sandberg bluegrass, squirreltail, arrowleaf balsamroot, and tapertip hawksbeard are sub-dominant species. The plant community includes other grasses, forbs, and shrubs that individually make up a minor part of the species composition. The ESD also states cheatgrass will occupy the site when disturbed. Natural fire frequency is 50-70 years.

Each pasture in the Juniper Ranch North Allotment has burned by wildfire and has been subsequently altered to varying degrees by drill and aerial seedings. In the last twenty years approximately 80 percent of the allotment has burned with some areas of the allotment burning as much as four times. The numerous wildfires and subsequent rehabilitation efforts have resulted in the plant communities being modified from their native state. The modifications have included seeding non-native and native perennial grasses and forbs as well as aerial seedings of sagebrush, grasses, and forbs. There are small inclusions of native vegetation in some areas of the allotment (< 7 percent of the allotment). Therefore, most of the pastures will be evaluated under Standard 5 – Seedings. Pasture 4 has been identified as having important nesting habitat for sage-grouse. Although the area providing the habitat is small it is important enough that the IIRH site was done in it; therefore, Pasture 4 will be evaluated under Standard 4 – Native Plant Communities.

Map 7: Idaho Indicators of Rangeland Health (IIRH) Sites

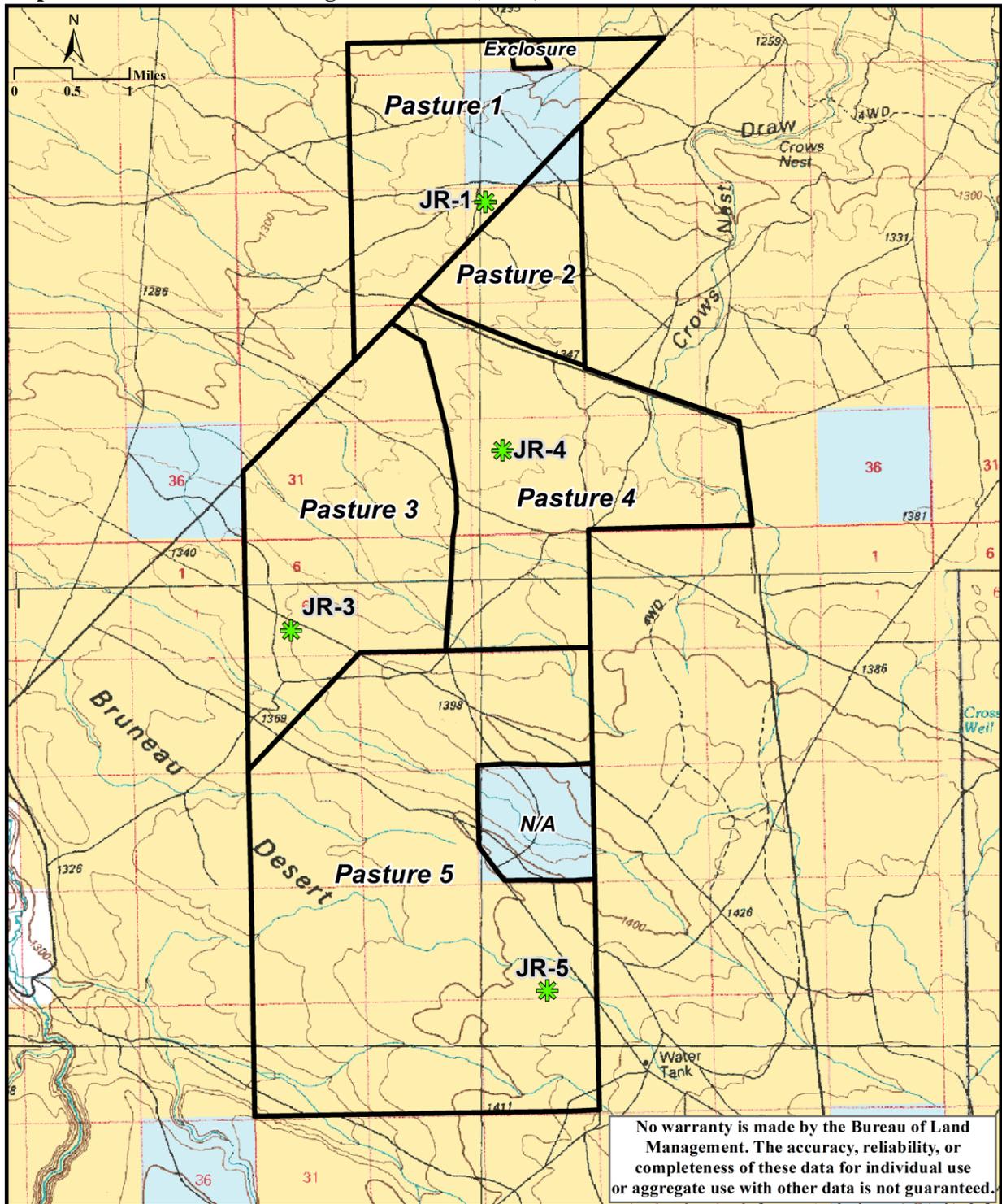


Table 11 shows the indicator ratings for each IIRH site in the Roseworth Point Allotment.

Table 11: Summary of 17 Rangeland Health Indicators

Indicators	Attributes	Degree of Departure from Ecological Site Description and/or Ecological Reference Area(s)				
	S = Soil & Site Stability H=Hydrologic Function B = Biotic Integrity	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
1. Rills	S, H					JR1, JR3, JR4, JR5
2. Water-flow Patterns	S, H					JR1, JR3, JR4, JR5
3. Pedestals and/or terracettes	S, H					JR1, JR3, JR4, JR5
4. Bare ground	S, H					JR1, JR3, JR4, JR5
5. Gullies	S, H					JR1, JR3, JR4, JR5
6. Wind-scoured, blowouts, and/or deposition areas	S					JR1, JR3, JR4, JR5
7. Litter movement	S					JR1, JR3, JR4, JR5
8. Soil surface resistance to erosion	S, H, B					JR1, JR3, JR4, JR5
9. Soil surface loss or degradation	S, H, B					JR1, JR3, JR4, JR5
10. Plant community composition and distribution relative to infiltration	H				JR1, JR3, JR5	JR4
11. Compaction layer	S, H, B					JR1, JR3, JR4, JR5
12. Functional/structural groups	B			JR1	JR3, JR5	JR4
13. Plant mortality/decadence	B					JR1, JR3, JR4, JR5
14. Litter amount	H, B			JR3	JR1, JR4, JR5	
15. Annual production	B					JR1, JR3, JR4, JR5
16. Invasive plants	B		JR3	JR1, JR4	JR5	
17. Reproductive capability of perennial plants	B					JR1, JR3, JR4, JR5

JR1= IIRH Site in Pasture 1, JR3= IIRH Site in Pasture 3, JR4= IIRH Site in Pasture 4, JR5= IIRH Site in Pasture 5

Attribute departure ratings were determined by considering the collective evidence of departure for the group of indicators related to each attribute (Pellant et al., 2005). Indicators showing departure from the ESD reference sheet can be more important or less important than those not departing based upon the effect of the departure on the ecological function of the site being evaluated. The ratings showing the degree of departure for the three attributes of rangeland health are in Table 12.

Table 12: 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					JR1, JR3, JR4, JR5
Hydrologic Function					JR1, JR3, JR4, JR5
Biotic Integrity			JR3	JR1, JR4, JR5	

JR1= IIRH Site in Pasture 1, JR3 = IIRH Site in Pasture 3, JR4= IIRH Site in Pasture 4, JR5= IIRH Site in Pasture 5

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

Multiple soil series exist within the Juniper Ranch North Allotment. The ESD describes most soils within the Juniper Ranch Allotment as silt loams. The Soil Survey Geographic (SSURGO) Database (NRCS 2012) shows 6 percent of the allotment has a severe wind erosion hazard, 56 percent has a moderate wind erosion hazard, and 38 percent has a slight wind erosion hazard. In addition, the soil survey shows 13 percent of the allotment has a high water erosion hazard and 87 percent has a medium water erosion hazard. Most of the allotment is relatively flat.

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

The ID team evaluated Standard 1 at seven IIRH sites using the ESD reference sheet #R011XY001ID (loamy 8-12”). The range of values (described in the ESD) used to rate indicators #4, #8, and #14 are 30-40 percent bare ground, 4 to 6 soil stability test values (scale of 1 to 6; Pellant et al., 2005), and 5 to 10 percent litter cover. Ground cover (Tables 13, 14, and 15) collected during HAF, ESI, and Production monitoring was used (uppermost canopy cover data) to assess watershed attributes.

Table 13: Percent ground cover (top layer) at IIRH/HAF sites

Cover Types	Percent Ground Cover			
	2013 IIRH Site JR1/2010 2010 HAF Site P1 (Pastures 1 and 2)	2013 IIRH Site JR3/2013 HAF Site P3-2 (Pasture 3)	2013 IIRH Site JR4/2010 HAF Site P4-1 (Pasture 4)	2013 IIRH Site JR5/2013 HAF Site P5-4 (Pasture 5)
Perennial Grasses	48	36	35	50
Annual Grasses	20	16	2	-
Perennial Forbs	-	1	1	-
Annual Forbs	4	-	2	-
Shrubs	-	1	23	-
Biotic Crust	6	8	23	22
Bare Ground	14	23	7	18
Litter	8	15	7	10
Rock	-	-	-	-

Table 14: Percent Ground Cover (Top Layer) at Other HAF Sites

Cover Types	Percent Ground Cover								
	Past. 3 2010 HAF Site P3-1	Past. 3 2010 HAF Site P3-3	Past. 4 2013 HAF Site P4-2	Past. 4 2010 HAF Site P4-3	Past. 4 2013 HAF Site P4-4	Past. 4 2013 HAF Site P4-5	Past. 5 2013 HAF Site P5-1	Past. 5 2013 HAF Site P5-3	Past. 5 2013 HAF Site P5-5
Perennial Grasses	50	19	42	50	54	26	48	38	52
Annual Grasses	8	19	18	12	-	23	8	17	7
Perennial Forbs	2	1	7	2	12	5	-	-	1
Annual Forbs	4	-	1	2	-	1	1	7	-
Shrubs	6	17	2	-	-	5	-	-	8
Biotic Crust	10	5	-	4	1	1	6	-	2
Bare Ground	12	24	6	24	14	11	13	5	10
Litter	6	15	24	6	19	28	24	33	20
Rock	2	-	-	-	-	-	-	-	-

Table 15: Percent Ground Cover (Top Layer) at ESI and Production Sites

Cover Types	Percent Ground Cover			
	Pasture 1 2006 ESI Site SK-28	Pasture 2 2006 ESI Site JW-28	Pasture 2 2002 Production Site JRC-3	Pasture 4 2002 Production Site JRC-4
Perennial Grasses	29	33	71	48
Annual Grasses	10	3	2	0
Perennial Forbs	0	1	7	0
Annual Forbs	3	4	1	0
Shrubs	0	4	1	0
Biotic Crust	0	1	4	22
Bare Ground	5	4	12	20
Litter	53	50	2	10
Rock	0	0	0	0

While the ESD indicates litter cover should range from 5 to 10 percent, ESI, production, and HAF data collected show litter values actually range from 12 to 74 percent cover (all layers) in the allotment. Even though the litter indicator may be rated as a departure from the reference condition, this departure may not be reflected in the overall attribute rating. Litter is providing ground cover for site protection and is replenishing nutrients. Moreover, the higher amounts of litter at the sites do not seem to be hindering ecological processes.

Average percent bare ground recorded in the 2006 ESI data, as well as the 2010, 2011, and 2013 HAF data ranges from 4 to 24 percent cover (top layer). In addition, soil stability tests (Pellant et al., 2005) were completed in Pastures 1, 4, and 5 and resulted in average soil stability values of 4.2, 4.8, and 5.0. These values are within the expected range of 4 to 6 indicating adequate soil surface resistance to erosion.

Pastures 1 and 2

Since 2000, most of Pastures 1 and 2 have burned in wildfires. These pastures are predominantly crested wheatgrass seedings and have burned multiple times in the past. IIRH Site JR1 (HAF Site P1) is representative of both Pastures 1 and 2. Cover data collected at ESI and Production sites are also used to evaluate Standard 1.

Cover data was collected at IIRH Site JR1 in late May of 2010. In late August of 2010 the site burned in the Long Butte Fire. When the ID team revisited the site in 2013 they determined the vegetation still appeared similar to that recorded in 2010; therefore, no new cover data was collected.

Perennial grasses at IIRH Site JR1 provided 48 percent of the ground cover. Biological crusts (6 percent) and litter amounts (8 percent) were low and have yet to recover from the 2010 wildfire. Only three sagebrush seedlings were at the site due to the short time (~3 years) since the wildfire. Yellow rabbitbrush (*Chrysothamnus viscidiflorus*) and rubber rabbitbrush (*Ericameria nauseosa*), which resprout after a wildfire, are present at trace levels. Cheatgrass (20 percent) and annual forbs (4 percent) also provide cover at the site.

Cover at the two ESI sites (SK-28, JW-28) and production site (JRC-3) are similar to the IIRH site in that perennial grasses provide most of the cover. Cheatgrass cover was much lower at these three sites than at the IIRH site. However, litter was much higher (53 and 50 percent cover) at the ESI sites than at the other sites.

The amounts of bare ground at all three sites were below the ESD range (30 to 40 percent). The average soil stability value for IIRH Site JR3 was 4.2 which is within the expected 4-6 range suggesting adequate soil surface resistance to erosion. There also was not evidence of soil loss at the IIRH site.

Two indicators of soil and hydrologic function deviated from the ESD reference condition: plant community composition and distribution relative to infiltration (“slight to moderate”) and litter amounts (“slight to moderate”). Litter slightly exceeded the range described in the ESD; however, it is providing ground cover and nutrients to the site. The plant community composition and distribution indicator rating is due to the lack of shrubs at the site. All the other indicators rated as a “none to slight” deviation from the ESD reference condition.

Pasture 3

Portions of Pasture 3 burned in 1995 in the Tuanna Fire and in 2000 during the Doe Fire. The middle part of the pasture has also burned in the past but the fire did not burn all the vegetation leaving patches of sagebrush. IIRH Site JR3/HAF P3-2 is in the southwest portion of Pasture 3. This site burned in 1995 and was seeded to crested wheatgrass post-fire. HAF data from the two other sites (P3-1 and P3-3) were also used to evaluate Standard 1. P3-1 is in the southeast portion of the allotment and P3-3 is in the northwest portion.

Perennial grass cover at IIRH Site JR3 is 36 percent and is composed of Sandberg bluegrass and crested wheatgrass. Thurber’s needlegrass is also present but was not recorded along the cover transect. Cheatgrass cover is 16 percent. Biological soil crusts provided 8 percent cover. Sagebrush was not observed at the site. Rubber rabbitbrush was recorded at 1 percent cover and occurs in small scattered patches.

Perennial grass cover at HAF Site P3-1 is abundant at 50 percent. Five perennial grass species occur; however, Sandberg bluegrass and crested wheatgrass dominate the site. Cheatgrass provided 8 percent cover. Perennial forbs were present providing 4 percent cover and biological soil crust cover is 10 percent. Both perennial grass and annual grass cover is 19 percent at HAF Site P3-3. Perennial grass cover is largely provided by Sandberg bluegrass with minimal amounts of Thurber’s needlegrass and squirreltail. Annual grass cover is predominantly cheatgrass. Shrubs were present (17 percent cover) with sagebrush providing almost all the shrub cover at the site.

The amounts of bare ground at all three sites were below the ESD range (30 to 40 percent). There also was no evidence of soil loss at the IIRH site. Similar to IIRH Site JR1, two indicators of soil and

hydrologic function at JR3 deviated from the ESD reference condition: plant community composition and distribution relative to infiltration (“slight to light”) and litter amounts (“moderate”). Although litter exceeded the range described in the ESD, it is providing ground cover and nutrients to the site. The plant community composition and distribution indicator rating is due to the lack of shrubs at the IIRH site. All the other indicators related to soil and site stability and hydrologic function rated as a “none to slight” deviation from the ESD reference condition.

Pasture 4

Portions of Pasture 4 burned in 1999, 2000, 2002, and 2006. IIRH Site JR4/HAF P4-1 is in the middle of Pasture 4. The IIRH site has not burned in recent years and is inhabited with native vegetation. HAF data from 4 other sites (P4-2, P4-3, P4-4, and P4-5) is also used to evaluate Standard 1. HAF Sites P4-2, P4-3, and P4-4 are in the southern portion of the allotment and P4-5 is in the northern part. All of these sites are also in native range.

Perennial grasses provide most of the cover (35 percent) at IIRH Site JR4, followed by sagebrush cover (23 percent). Sandberg bluegrass dominates the perennial grass cover. Thurber’s needlegrass and squirreltail are also present. Annual grass and forbs provides minimal cover. Biological soil crust cover is 23 percent.

Most of the cover at the other HAF sites is perennial grasses. Thurber’s needlegrass provided most of the cover at HAF Site P4-4 while Sandberg bluegrass had the greatest amount of cover at the other three HAF sites. Cheatgrass cover ranged from 12 to 18 percent at three sites and was not recorded at HAF Site P4-4. Annual forbs and biotic crusts were present at most sites but cover was minimal. Sagebrush cover was recorded at HAF Site P4-2 but in low amounts (2 percent). Shrubs were not recorded at the other sites.

The amount of bare ground at all five sites was below the ESD range (30 to 40 percent). The average soil stability value for IIRH Site JR4 was 4.8 which is within the expected 4-6 range suggesting adequate soil surface resistance to erosion. There also was not evidence of soil loss at the IIRH site.

Litter was the only indicator of soil and hydrologic health deviating from the ESD reference condition. Although litter exceeded the range described in the ESD, it is providing ground cover and nutrients to the site. All the other indicators rated as a “none to slight” deviation from the ESD reference condition.

Pasture 5

Portions of Pasture 5 burned in 1995, 1999, and 2002. The pasture is mostly composed of grasslands. IIRH Site JR5 is located in the southeastern portion of the pasture in a ‘Secar’ Snake River wheatgrass seeding. HAF Site P5-4 is also located in the same spot. The ID team determined the site was similar enough to represent a crested wheatgrass seeding in the northern portion of the pasture. Cover data from HAF Site P5-2 as well as four other HAF sites (P5-1, P5-2, P5-3, and P5-5) is used to evaluate Standard 1. HAF sites P5-1, P5-3, and P5-4 are located in the southern two-thirds of the pasture and P5-5 is in the northeastern corner.

Perennial grasses were the only vegetation recorded along the cover transect at IIRH Site JR5. Ground cover provided by perennial grasses was 50 percent at the site. Biological soil crusts also provided cover (22 percent). ‘Secar’ Snake River wheatgrass cover dominated the site. Sandberg bluegrass was also present. Sagebrush was not observed at the site.

Ground cover at the other HAF sites was also dominated by perennial grasses, specifically ‘Secar’ Snake River wheatgrass at Sites P5-1 and P5-3 and crested wheatgrass at P5-2. Cheatgrass was recorded at P5-1 and P5-2 but not at P5-2. Forbs did not provide much ground cover. Biological soil crust cover was also low. Sagebrush was the only shrub recorded and occurs at Site P5-5.

The amounts of bare ground at all five sites were below the ESD range (30 to 40 percent). The average soil stability value for IIRH Site JR5 was 5.1 which is within the expected 4-6 range suggesting adequate soil surface resistance to erosion. There also was no evidence of soil loss at the IIRH site.

Evaluation of Standard 1

The 2013 field assessment rated most of the indicators related to Standard 1 as a “none to slight” departure from ESD reference condition. The plant community composition and distribution relative to the infiltration and runoff indicator rated “slight to moderate” at three IIRH sites due to lack of shrubs. Pasture 1 (IIRH Site JR1) has burned several times in recent history which has not allowed sagebrush to reestablish. Pastures 3 and 5 were seeded following wildfires resulting in a monoculture of perennial grasses including a stronghold of seeded species. These pastures last burned 18 to 28 years ago. These fires removed most of the sagebrush. Deep-rooted perennial bunchgrasses are well represented at most of the IIRH, HAF, and ESI sites. Shrubs and tall bunchgrasses are important to range sites as they trap snow in the winter, slow overland flows, reduce wind speeds at ground level, and provide paths for water infiltration thus increasing the total amount of water available on a site (Ryel et al. 2002; Eldridge and Rosentreter 2004). While sagebrush cover is reduced because of wildfire, deep-rooted perennial bunchgrasses are well represented. Although total shrub cover is reduced, perennial grass species appeared vigorous and are producing seedheads. This suggests reduced shrub cover is not affecting either water infiltration or nutrient cycling negatively, at least not to the point of reducing perennial grass vigor or its reproductive capability. IIRH Site JR4 in Pasture 4 has not burned in recent history and has appropriate perennial shrub and grass cover. Therefore, the plant community composition and distribution relative to the infiltration and runoff indicator did not deviate from the ESD reference condition.

Litter cover was higher than in the ESD reference condition resulting in ratings from “slight to moderate” to “moderate”. While the litter amount indicator ratings deviated from reference condition, increased litter amounts are not negatively affecting the area based on plant vigor at the site. Cheatgrass may be influencing litter amounts in some areas of the allotment, especially in Pasture 3.

Trend data in (Site 10S10E35) Pasture 4 shows an upward trend in vegetation cover. Deep-rooted perennial grasses, litter, and biological soil crusts are increasing and bare ground is decreasing. This trend further protects the site from erosion and aids in the capture, infiltration, and release of water at that site.

The low amounts of bare ground and the lack of erosional features recorded for the site suggests water is infiltrating and being retained on site. Biological soil crusts are found at almost all the HAF, ESI, and production sites at varying amounts. Crusts are important because they help bind soil particles together which reduces the potential for erosion, and they fix both carbon and nitrogen (Belnap, 2003). Signs of accelerated erosion in the form of pedestals, terracettes, or rills were not recorded at any of the sites. Completed soil stability tests at IIRH Sites JR1, JR4, and JR5 had an average stability value of 4.2, 4.8, and 5.1 respectfully, indicating adequate soil surface resistance to erosion. All of the other indicators for the Soil and Site Stability and Hydrologic Function attributes were in line with the ESD reference condition; therefore, the attributes rated as a “none to slight” deviation in all pastures.

Standard 1 Evaluation Finding – Juniper Ranch North Allotment is

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

Rationale for Evaluation Finding

Abundant perennial vegetation and biological soil crusts are present within the Juniper Ranch North Allotment to provide protection for site stability. Within some of the more recently burned areas, biological soil crusts are generally present in low amounts; however, adequate vegetation and litter are

present to protect the soil surface from erosion. Litter amounts deviated from the ESD reference condition at all the sites. However, litter is providing cover for site protection, replenishing nutrients, and does not appear to be negatively affecting ecological processes.

Due to wildfires and vegetation treatments, shrubs are scarce in portions of the allotment. Wildfire has essentially eliminated shrubs in these areas. Shrubs trap snow and have a tap-root that penetrates deep into the soil profile; therefore, the lack of shrubs has the potential to affect infiltration and retention of soil moisture. However, there are enough deep-rooted perennial bunchgrasses in most areas to carry soil moisture deep into the soil profile. In addition, perennial grasses appeared vigorous and were producing seedheads at all sites, suggesting reduced shrub cover is not negatively affecting infiltration to the point of reducing plant vigor or reproductive capability.

Evidence of accelerated erosion, such as active rills, gullies, flow patterns, etc., was not present. Bare ground amounts are lower than expected and topography is relatively flat, reducing the risk for accelerated soil erosion. Infiltration, retention, and release of water processes relative to soil, vegetation, climate and landform are providing for proper nutrient and hydrologic cycling and energy flow throughout the Juniper Ranch North Allotment.

Standard 2 (Riparian Areas & Wetlands)

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

X Standard Doesn't Apply

Riparian vegetation, springs, and wetlands are not present in the Juniper Ranch North Allotment. Therefore, Standard 2 does not apply.

Standard 3 (Stream Channel/Floodplain)

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

X Standard Doesn't Apply

Riparian vegetation, springs, and wetlands are not present in the Juniper Ranch North Allotment. Therefore, Standard 2 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

Pasture 4

IIRH Site JR4 is in a native plant community in Pasture 4. The site has not burned in recent history. Cover data was collected at five HAF sites and a production site (Table 16). The IIRH site is in the same place as HAF Site P4-1. In addition to the IIRH field assessment, the HAF cover data and production cover data (ESI Site RA-7A) are also used to evaluate Standard 4 in Pasture 4.

Table 16: Vegetation Cover in Pasture 4 (HAF, HAF, Production Sites; Top Layer)

Vegetation Class	Species	Percent Cover					
		2010 HAF Site P4-1/ 2013 IIRH Site JR4	2013 HAF Site P4-2	2010 HAF Site P4-3	2013 HAF Site P4-4	2013 HAF Site P4-5	2002 Site JRC-4
Perennial Grasses	Bluebunch Wheatgrass	-	2	-	-	-	-
	Thurber's Needlegrass	1	10	2	29	8	33
	Squirreltail	2	5	2	4	7	5
	Sandberg Bluegrass	32	25	46	21	11	6
	Indian Ricegrass (<i>Achnatherum hymenoides</i>)	-	-	-	-	-	1
	Western Wheatgrass	1					
Annual Grasses	Cheatgrass	2	18	12	12	23	10
Perennial Forbs	Maiden Blue-eyed Mary (<i>Collinsia parviflora</i>)	1	-	-	-	-	-
	Longleaf Phlox	-	4	-	2	2	3
	Sagebrush Phlox (<i>Phlox aculeata</i>)	-	3	2	10	3	1
Perennial Forbs	Ladak Alfalfa	-	-	-	-	-	6
Annual Forbs	Spring Draba (<i>Draba verna</i>)	2	-	-	-	-	-
	Tumble Mustard	-	-	2	-	1	25
	Curveseed Butterwort	-	2	-	-	-	-
Shrubs	Wyoming Big Sagebrush	23	2	-	-	4	-
	Yellow Rabbitbrush	-	-	-	-	1	-
Vegetation Percent Cover Total		64	67	64	66	60	89
Other Cover	Microbiotic Crust	23	-	4	1	1	3
	Litter	7	24	6	19	28	2

- A dash denotes utilization data was not collected

Except for HAF Site P4-5, native perennial grasses provide the dominant plant cover. Cheatgrass provides almost half of the grass cover at HAF Site P4-5 (23 percent). Thurber's needlegrass was measured at all the sites except for Site P4-1 (IIRH Site JR4). It was the dominant cover at Sites P4-4 (29 percent) and JC4 (33 percent). Wyoming big sagebrush cover was abundant at HAF Site P4-1/IIRH Site JR4 (23 percent), provided little cover at Sites P4-2 (2 percent) and P4-5 (4 percent), and was not measured at the other sites. Cheatgrass cover was measured at all the sites at varying amounts. Cheatgrass cover was the highest at HAF Site P4-5.

Wyoming big sagebrush and Sandberg bluegrass dominate the IIRH site. Cheatgrass cover was minimal (2 percent). Although only one native perennial forb was recorded along the transect, 19 perennial forbs were documented in the IIRH site near the transect. Five native annual forbs were also recorded in the area. Field notes stated the site has a good forb component with good diversity and abundance. Thurber's needlegrass plants at the site are vigorous and producing more biomass than expected considering drought conditions in 2013. Invasive plants were the only biotic indicator deviating from the ESD reference sheet. Cheatgrass is scattered at the site, with higher density of plants occurring in disturbed sites, particularly along a pipeline and road. Noxious weed species were not observed at the site during the IIRH field visit. Photo 3 shows IIRH Site JR4.

Photo 3: 2013 IIRH Site JR4 (Pasture 4)



HAF Site P4-2 burned in 2002 in the Big Crow Fire. Following the fire Ladak alfalfa, Western yarrow, and Wyoming sagebrush were aerial seeded. Eight years since the fire sagebrush cover is minimal in the burned area; however, photos show there are some pockets of sagebrush scattered in the area.

HAF Site P4-3 also burned in the Big Crow Fire, as well as the 1985 Crows Nest Fire. It was also aerial seeded with the same seed mix as HAF P4-2 after the Big Crow Fire. There are no records indicating the area was rehabilitated after the Crows Nest Fire. Field notes in 2013 state there were very few young sagebrush (trace amounts) in the burned area. Cheatgrass and burr buttercup were present and appeared widespread through the area; however, burr buttercup was not recorded along the cover transect. Native perennial forbs were found in trace amounts with many of the expected species absent at the site.

HAF Site P4-4 burned in the 2002 Big Crow Fire, 1985 Crows Nest Fire, and 1957 Clover Road Fire. Again, this area was aerial seeded after the Big Crow Fire, with no record of rehabilitation efforts occurring after the Crows Nest and Clover Road Fires. In 2013 there were a few isolated sagebrush plants in the burned area. There were six perennial forbs noted at the site.

HAF Site P4-5 burned in the 2000 Crimson and Clover Fire. The site was aerial seeded with a Ladak alfalfa, Western yarrow, and Wyoming big sagebrush mix after the fire. Field notes state there is a fair diversity of forbs with five species noted. Photos show sagebrush is reestablishing in the area.

Based on the preponderance of information, the Biotic Integrity attribute rated “slight to moderate” departure from the ESD reference condition. This rating was given due to cheatgrass being scattered throughout the pasture, with it dominating the pipeline route and other disturbed areas.

Evaluation of Standard 4

Pasture 4

IIRH Site JR4 (HAF P4-1) has not burned in recent years: however, the rest of the pasture has burned, with some areas burning more than once. Cheatgrass is scattered throughout the site as well as throughout Pasture 4. Trend data suggests cheatgrass established in the pasture after the removal of sagebrush from wildfire. Cheatgrass was not documented in the nested plot transects or in the 3x3 plot until after the site burned. ESI data documented cheatgrass cover at 59 percent in 2002, following the 2000 Crimson and Clover Fire. Wildfire combined with site disturbance, such as disturbance along a pipeline that was not seeded or the seeding was not successful, likely provided an opportunity for cheatgrass to establish and spread.

Wyoming sagebrush provides much of the cover at IIRH Site JR4. However, it is not as abundant throughout most of the pasture due to recent wildfire (<10 years). Sagebrush has started to reestablish in burned areas of Pasture 4. Although not recorded along all the HAF transects, some sagebrush was noted at the HAF sites. Perennial grasses were vigorous and producing adequate seed at the IIRH site. Forbs were present (19 perennial and 5 native annual forbs) providing diversity to the site.

Standard 4 Evaluation Finding – Pasture 4 is:

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

Rationale for Evaluation Finding

IIRH Site JR4 is on a Loamy 8 to 12”, Wyoming big sagebrush/bluebunch wheatgrass – Thurber’s needlegrass ecological site. The site has not burned in recent history. The site is similar to the ecological site description. Sagebrush cover dominates the site and perennial grasses with satisfactory amounts of forbs are in the immediate area. The HAF transect did not document much Thurber’s needlegrass cover; however, photos of the site (Photo 3) show it is there in suitable amounts. ESI data and cover data collected throughout Pasture 4 also shows Thurber’s needlegrass in adequate amounts. Although Sandberg bluegrass cover was high (32 percent) at the IIRH site, there were enough deep-rooted grasses and sagebrush in the overall plant composition to effectively perform nutrient cycling and water infiltration processes at the site. This is evidence by the vigor of the plants present at the site. Perennial species are productive and capable of reproduction and recruitment of new seedlings. Further, trend data in this pasture show perennial grasses are maintaining or increasing their frequency even with higher cheatgrass frequency at the trend site.

Noxious weeds were not noted at the IIRH, ESI, or trend sites. Litter amounts were slightly higher than expected, but it is providing cover for site protection and nutrient cycling is occurring. The ID team visited other native sites in Pasture 4 and concluded these areas were performing similarly despite sagebrush being absent. The native vegetation communities in Pasture 4 are functioning to maintain life form diversity, production, native animal habitat, nutrient cycling, energy flow, and the hydrologic cycle.

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.

The remaining pastures of the Juniper Ranch Allotment are assessed under Standard 5: Pastures 1, 2, 3, and 5. IIRH sites in these pastures are in seedings put in after wildfires. A ‘Secar’ Snake River wheatgrass mix was planted in Pasture 5 and all the other sites are in a crested wheatgrass seeding. HAF vegetative

cover data collected in 2010 and 2013, as well as 2006 ESI and 2002 production cover data is used to evaluate Standard 5 (Tables 17 and 18). Each IIRH site and its representative pastures are discussed separately.

Table 17: Percent Cover at 2010 and 2013 HAF/IIRH Sites (Top Layer)

Vegetation Class	Species	Percent Cover		
		Pasture 1 HAF Site P1-1/IIRH Site JR1 (2010)	Pasture 3 HAF Site P3-2/IIRH Site JR3 (2013)	Pasture 5 HAF Site P5-4/IIRH Site JR5 (2010)
Perennial Grasses	Crested Wheatgrass	28	14	-
	'Secar' Snake River Wheatgrass	-	-	36
	Sandberg Bluegrass	20	22	14
Annual Grasses	Cheatgrass	20	16	-
	Six-week Fescue	-	2	-
Perennial Forbs	Sagebrush Phlox	-	1	-
Annual Forbs	Curveseed Butterwort	2	-	-
	Mountain Tansymustard (<i>Descurainia incana</i>)	2	-	-
Shrubs	Rubber Rabbitbrush	-	1	-
	Wyoming Big Sagebrush	-	-	-
Vegetation Percent Cover Total		72	62	50
Other Cover	Biological Crust	6	8	22
	Litter	6	15	10

- A dash denotes utilization data was not collected

Table 18: Percent Cover at ESI, Production Sites, and HAF Sites (Top Layer)

Vegetation Class	Species	Percent Cover						
		Past. 1 2006 ESI Site SK- 28	Past. 2 2006 ESI Site JW-28	Past. 2 2002 Productio n Site JRC- 3	Past. 3 2010 HAF Site P3-1	Past. 5 2013 HAF Site P5-1	Past. 5 2013 HAF Site P5-2	Past. 5 2013 HAF Site P5-3
Perennial Grasses	Basin Wildrye	-	-	-	-	3	-	-
	'Secar' Snake River Wheatgrass	-	-	-	-	29	-	27
	Thurber's Needlegrass	-	-	-	-	-	3	-
	Squirreltail	-	-	-	2	6	1	-
	Crested Wheatgrass	20	9	62	18	-	15	-
	Sandberg Bluegrass	9	24	9	26	9	11	4
	Indian Ricegrass	-	-	-	2	-	-	-
	Western Wheatgrass	-	-	-	2	1	1	7
Annual Grasses	Cheatgrass	7	3	2	8	8	-	17
	Six-week Fescue	3	-	-	-	-	1	-
Perennial Forbs	Longleaf Phlox	-	1	1	1	-	-	-
	Spiny Phlox	-	-	4	-	-	2	-
	Slender Phlox (<i>Microsteris</i>)	-	-	-	-	-	1	-

Vegetation Class	Species	Percent Cover						
		Past. 1 2006 ESI Site SK- 28	Past. 2 2006 ESI Site JW-28	Past. 2 2002 Productio n Site JRC- 3	Past. 3 2010 HAF Site P3-1	Past. 5 2013 HAF Site P5-1	Past. 5 2013 HAF Site P5-2	Past. 5 2013 HAF Site P5-3
	<i>gracilis</i>)							
	Woolly Pod Milkvetch (<i>Astragalus purshii</i>)	-	-	2	-	-	-	-
	Mourning Milkvetch (<i>Astragalus atratus</i>)	-	-	-	-	-	1	-
	Antennaria spp.	-	-	-	2	-	-	-
Annual Forbs	Maiden Blue-eyed Mary (<i>Collinsia parviflora</i>)	1	-	-	-	-	-	-
	Curvseed Butterwort	-	-	-	-	-	3	2
	Nodding Chickweed (<i>Cerastium nutans</i>)	-	-	-	-	1	-	1
	Tumble Mustard	3	1	1	4	-	-	-
	Tall Annual Willowherb	-	3	-	-	-	-	-
Annual Forbs	Western Tansymustard (<i>Descurainia pinnata</i>)	-	-	-	-	-	-	4
Shrubs	Wyoming Big Sagebrush	-	1	-	4	-	-	-
	Yellow Rabbitbrush	-	3	1	-	-	-	-
	Rubber Rabbitbrush	-	-	-	2	-	-	-
Vegetation % Cover Total		42	41	82	66	57	39	62
Other Cover	Biologic Crust	-	1	4	10	6	6	-
	Litter	22	32	2	6	23	37	33

- A dash denotes utilization data was not collected

Pastures 1 and 2

IIRH Site JR1, Loamy 8-12"

IIRH Site JR1 is in a crested wheatgrass seeding in Pasture 1 (Photo 4). The site is also representative of Pasture 2. The site has burned several times in recent history (1979 Crows Nest Fire, 2000 Crimson and Clover Fire, 2002 Crows Nest Fire, 2006 Sailor Cap Fire, and 2010 Long Butte Fire). Cover data was collected at HAF Site P1-1 (2010) and ESI Site SK-28 (2006) in Pasture 1. It was also collected in Pasture 2 at ESI Site JW-28 (2006) and Production Site JRC-3 (2002). The IIRH site is in the same place as HAF Site P1-1. In addition to the IIRH field assessment, the HAF cover data, ESI, and production cover data are also used to evaluate Standard 5 in Pasture 3.

Photo 4: 2013 IIRH Site JR1 (Pasture 1)



IIRH Site JR1 was seeded to crested wheatgrass after both the 1979 Crows Nest and 1985 Crows Nest Fires. Crested wheatgrass provides the most cover (28 percent). Sandberg bluegrass and cheatgrass each provide 20 percent cover. Sagebrush was not recorded along the transect. Three sagebrush seedlings were noted in the area. Both green rabbitbrush and rubber rabbitbrush are present in small islands. No perennial forbs were recorded on the transect. The IIRH field notes describe forbs as being low in abundance, but overall forb diversity is good. Nine perennial forbs and one exotic forb (Salsify) were noted at the IIRH site.

The IIRH field notes and cover data show shrubs are sparse and forb species are reduced; therefore, the functional/structural group indicator was rated as a “moderate” departure from the ESD reference condition. The moderate rating was in part given due to repeated wildfire influencing shrub establishment. The indicator for litter amount was a “slight to moderate” departure from the reference condition due to an increased amount of litter at the site. Cheatgrass cover was 20 percent and scattered throughout the

site, and most commonly occurring in disturbed sites. Therefore, the indicator for invasive plants is a "moderate" rating due to cheatgrass. All other indicators rated as "none to slight".

ESI Site SK-28 is also in Pasture 1 in a crested wheatgrass seeding. It also has burned in the same five wildfires as IIRH Site JR1/HAF Site P1-1. Crested wheatgrass provides most of the vegetation cover (20 percent) with Sandberg bluegrass following with 9 percent cover. Cheatgrass was present at 7 percent cover. Forbs outside of the cover transects were not noted. Litter was 22 percent cover. Sagebrush is also reduced at this site.

ESI Site JW-28 and Production Site JRC-3 are in Pasture 2, both in a crested wheatgrass seeding. Sandberg bluegrass cover dominates ESI Site JW-28 (24 percent) followed by crested wheatgrass (9 percent), and cheatgrass (3 percent). Crested wheatgrass provided most of the cover at Production Site JRC-3 (62 percent), then Sandberg bluegrass (7 percent) and cheatgrass (2 percent). Sagebrush was not recorded along the transects at either sites but is seen in the photos in limited amounts. Three forbs were recorded along the transect at the production site: longleaf phlox, spiny phlox, woolly pod milkvetch. Forbs were not recorded at the ESI site.

All indicators related to the Biotic Integrity attribute other than functional/structural groups, litter amount, and invasive plants rated "none to slight". The Biotic Integrity attribute rated "slight to moderate" departure from the ESD reference condition due to the lack of shrubs, reduced forbs, and invasive species scattered throughout the site and pasture.

Pasture 3

IIRH Site JR3, Loamy 8-12"

IIRH Site JR3 is in a crested wheatgrass seeding in Pasture 3 (Photo 5). The site burned in the 1981 Clover Fire, 1985 Crows Nest Fire, and 1995 Tuanna Fire. Cover data was collected at HAF Sites P3-1, P3-2, and P3-3(2010). The IIRH site is in the same place as HAF Site P3-2. In addition to the IIRH field assessment, the 2010 HAF cover data at Site P3-1 is also used to evaluate Standard 5 in Pasture 3. HAF Site P3-3 is in native vegetation; therefore, data from this site is not used to assess the crested wheatgrass seeding.

The IIRH Site JR3 (HAF Site P3-2) was seeded to crested wheatgrass after the Clover Fire and the Tuanna Fire. The area burned by the Tuanna Fire was also aerial seeded with Wyoming big sagebrush, yellow sweetclover, and Ladak' alfalfa. Sandberg bluegrass provides most of the perennial grass cover (22 percent) followed by crested wheatgrass (14 percent). Cheatgrass cover was 16 percent. Wyoming sagebrush was not recorded along the transect and does not appear in the photos. Rubber rabbitbrush provided 1 percent cover and is sporadically scattered throughout the site. Longleaf and sagebrush phlox were both recorded along the transect. Eleven native and two exotic perennial forbs, yellow salsify and common dandelion (*Taraxacum officinale*) were noted at the IIRH site. A review of 2013 NAIP imagery indicates several distinct patches of sagebrush, some meet the minimum size (>20 acres) for mapping.

HAF Site P3-1 burned in the Crows Nest Fire in 1985. The area was seeded to crested wheatgrass after the fire. Sandberg bluegrass provides the dominant cover at the site (26 percent), followed by crested wheatgrass (18 percent) and cheatgrass (8 percent). Western wheatgrass and squirreltail were also recorded along the transect as well as Wyoming sagebrush (4 percent cover) and rabbitbrush (2 percent cover). Biological soil crust cover was 10 percent.

Photo 5: 2013 IIRH Site JR3 (Pasture 3)



Most of the indicators of rangeland health for a seeding were within the expected values of the ESD reference condition at IIRH Site JR3/HAF Site P3-1. Three indicators deviated from the ESD: functional/structural groups, litter amounts, and invasive plants. Functional structural groups were rated as a "moderate" deviation based on Wyoming sagebrush not reestablishing on the site. The site burned in 1995, but few shrubs have reestablished in the area since the fire. Further, HAF Site P3-1 has minimal sagebrush cover. This site burned in 1985. All other plant groups were represented at the IIRH site. IIRH field notes describe some forbs as abundant with good diversity of species for a crested wheatgrass seeding. Although, Thurber's needlegrass provided 4 percent of the cover along the transect, field notes state that it was present in good numbers.

Invasive plant indicator rated as a "moderate to extreme" deviation from the ESD reference condition. Cheatgrass was recorded at 16 percent cover along the transect. However, it was noted during the 2013 IIRH visit as common throughout most of the site. Photos taken during the visit support this conclusion. The indicator for invasive plants rated "moderate to extreme" due to the amount of cheatgrass in the 2013 assessment of the site.

The indicator for litter amount rated as a "moderate" departure from the reference condition due to an increased amount of litter (35 percent cover for all layers) at the site. High amounts of cheatgrass may be influencing litter amounts.

All indicators related to the Biotic Integrity attribute other than functional/structural group, litter amount, and invasive plants rated "none to slight". The Biotic Integrity attribute rated as a "moderate departure" from the reference condition due to the low amounts of shrubs, specifically Wyoming sagebrush, and cheatgrass being common throughout the site.

Pasture 5

IIRH Site JR5, Loamy 8-12"

IIRH Site JR5 is in a 'Secar' Snake River/crested wheatgrass seeding (Photo 6). The site burned in the 1995 Tuanna Fire. Cover data was collected at HAF Sites P5-1, P5-2, P5-3, P5-4, and P5-5. The IIRH site is in the same place as HAF Site P5-4. In addition to the IIRH field evaluation, the HAF cover data, except for Site P5-5, is also used to evaluate Standard 5 in Pasture 3. HAF Sites P5-2 and P5-5 are in native vegetation; therefore, data from these sites are not used to assess the 'Secar' Snake River/crested wheatgrass seeding.

Photo 6: 2013 IIRH Site JR5 (Pasture 5)



'Secar' Snake River wheatgrass was planted at the IIRH site (HAF Site P5-4) after the Tuanna Fire. Only two plant species were recorded along the transect: 'Secar' Snake River wheatgrass (36 percent cover) and Sandberg bluegrass (14 percent cover). Biotic crusts provide 22 percent of the cover. Shrubs and forb species were not recorded along the transect. Some sagebrush is establishing in the seeding, but is present in low amounts. 'Secar' Snake River wheatgrass provides most of the cover at both HAF Sites P5-1 and P5-3. Cheatgrass was present at both of the sites (8 percent cover at P5-1 and 17 percent cover at P5-3) as well as three annual weedy forbs. Although present, these forbs do not provide much cover. Site P5-1 burned in the 1995 Tuanna Fire and 1999 Doe Fire and Site P5-3 also burned in the Tuanna Pasture. Crested wheatgrass and Sandberg bluegrass provided most of the grass cover at HAF Site P5-2. Cheatgrass was not recorded along the cover transect. Burr buttercup was present providing 3 percent cover as well as four perennial forbs (4 percent cover). Sagebrush was also not recorded along the transect at Site P5-2.

The 2013 IIRH field notes and cover data (HAF Site P5-4) show shrubs are present at low levels at the site; therefore, the functional/structural group indicator rated as a "slight-moderate" departure from the

reference condition. The IIRH notes identify patches of Wyoming sagebrush and sagebrush seedlings are present, but that ‘Secar’ Snake River wheatgrass vigor and productivity may be inhibiting establishment of sagebrush. ‘Secar’ Snake River wheatgrass is more vigorous and drought tolerant than the native bluebunch wheatgrass (NRCS, 2006) and therefore, more competitive. There are also patches of sagebrush habitat scattered in the pasture; some of them exceed the minimum mapping size of 20-acres (Map 3). Twelve native forb species were recorded at the site. All of the other plant groups were represented in amounts expected for a seeding (12 native forb species, 5 perennial grass species including Thurber’s needlegrass and squirreltail). Sagebrush was not recorded along HAF Sites P5-1, P5-2, or P5-3. Field notes describe both areas as “grasslands”.

The indicator for litter amount rated as a “slight to moderate” departure from the ESD reference condition. Litter amounts were slightly increased (24 percent cover for all layers) at the IIRH site and high at the other three HAF sites (23, 33, and 31 percent).

The Invasive Plants indicator also rated as a “slight to moderate” deviation. Although cheatgrass was not recorded along the 2010 HAF transect the IIRH assessment notes it is present in disturbed areas throughout the pasture. Rush skeletonweed was present at IIRH Site JR5. It has also been documented in several areas in Pasture 4 as well as Pasture 5. All of the infestations have been treated. Cheatgrass cover at HAF Sites P5-1 and P5-2 was 8 and 17 percent.

All indicators related to the Biotic Integrity attribute other than functional/structural groups, litter amount, and invasive plants were rated none to slight. The Biotic Integrity attribute was rated as a “slight to moderate” departure from the reference condition, largely because of invasive plants and decreased amounts of Wyoming sagebrush.

Evaluation of Standard 5

Pastures 1, 2, and 5

The type and amount of vegetation has been altered over the years due to repeated wildfire (three to four times since 1999) in Pastures 1 and 2 and ESR seedings put in after wildfires in all the seeded pastures. Pastures 1 and 2 have recently burned in wildfire (<3 years). Wildfire has resulted in reduced amounts of Wyoming sagebrush in Pastures 1 and 2. Forbs are present but not as common as described in the ESD reference condition (native range) and cheatgrass is scattered in both pastures. Cheatgrass cover ranged from 2 to 20 percent. Crested wheatgrass, a deep-rooted perennial grasses, as well as Sandberg bluegrass are providing adequate cover. Biological soil crusts are present but at reduced amounts. Precipitation was below the thirty-year average in 2012 and 2013; however, plant production was as expected considering dry growing conditions. Reduced amounts of sagebrush and forb species and cheatgrass scattered throughout the pastures influenced the attribute rating (slight to moderate) in Pastures 1 and 2. No discreet islands of sagebrush habitat were present large enough to meet the mapping criteria (>20-acres) either pasture.

Since 2011, when livestock management changed, cattle used Pasture 1 one year during the winter months, and in the spring during two consecutive years. Livestock utilization ranged from 6 percent to 31 percent on crested wheatgrass. Cattle grazed Pasture 2 twice in the spring and did not graze the pasture one year during the past three years. Utilization data is available for 2007 and was 37 percent on crested wheatgrass.

‘Secar’ Snake River wheatgrass (27 to 36 percent) and Sandberg bluegrass (4 to 14 percent) cover dominate the vegetation in Pasture 5. Sagebrush was absent at the IIRH site and HAF sites, but is present in the pasture, occurring mostly in patches. Cheatgrass cover at HAF Site P5-1 was 8 percent and 17 percent at P5-3. It was not recorded along the HAF transect at the IIRH site (P5-4). However, notes taken during the IIRH assessment state it is present in disturbed areas. A few rush skeletonweed plants were

also observed at the site. (These plants were hand pulled and removed from the site.) All three sites burned in the 1995 Tuanna Fire with HAF Site P5-3 also burning in the 1999 Doe Fire. Considering how long it has been since these fires (14 to 18 years) sagebrush should be present in greater amounts. However, 'Secar' Snake River wheatgrass appears to limit sagebrush establishment in seeded areas. Reduced amounts of sagebrush and cheatgrass amounts resulted in the "slight to moderate" attribute rating in Pasture 5.

Actual use after livestock management changed in 2011 shows cattle used Pasture 5 in the spring/early summer in 2011, in the spring and winter in 2012, and in the winter in 2013. In addition to spring use in 2012, TNR AUMs were also authorized during the winter. AUMs used from 2011 to 2013 ranged from 350 AUMs in 2013 to 1271 AUMs in 2012. Utilization was measured on 'Secar' Snake River wheatgrass and on Thurber's needlegrass. Use on 'Secar' Snake River wheatgrass ranged from 11 to 31 percent since 2007 (not measured before 2007). Thurber's needlegrass use ranged from 6 to 56 percent. Moderate use occurred on Thurber's needlegrass four out of seven years. Use on Thurber's needlegrass has not been measured since 2009.

Standard 5 Evaluation Finding- Pastures 1, 2, and 5 are:

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

Rationale for Evaluation Finding

The Biological attribute rating for Pastures 1, 2, and 5 is "slight to moderate". The functional/structural indicator deviated from the ESD reference condition in all three pastures. This is mainly due to reduced amounts of shrubs, particularly, Wyoming big sagebrush. Perennial grasses are well represented. Forbs are present in low amounts but diversity of species is as expected for seedings. Biological soil crusts are also present. Plant production is either within or above the ESD reference condition range. Cheatgrass is scattered throughout Pastures 1 and 2 and is found in greater amounts in disturbed areas. Repeated wildfire in the past few years has likely influenced cheatgrass presence in these pastures. Although cheatgrass is present, perennial plants are vigorous and are reproducing. Soils are also stable and precipitation infiltration rates appear adequate for plant use.

The seeded plant communities currently provide habitat for grassland animal species such as the Savannah sparrow (*Passerculus sandwichensis*), grasshopper sparrow (*Ammodramus savannarum*), and montane vole (*Microtus montanus*) and generalist wildlife species such as the horned lark (*Eremophila alpestris*), Western meadowlark (*Sternella neglecta*), deer mouse (*Peromyscus maniculatus*), and coyote (*Canis latrans*). It also can provide seasonal forage for mule deer (*Odocoileus hemionus*), pronghorn (*Antilocapra americana*), and elk (*Cervus elaphus*). As shrubs reestablish, shrub obligate wildlife species should to return to the area.

In general, the seeded vegetation communities in Pastures 1, 2, and 5 are functioning to maintain life form diversity, production, native animal habitat, nutrient cycling, energy flow, and the hydrologic cycle.

Evaluation of Standard 5

Pasture 3

Crested wheatgrass (14 to 18 percent) and Sandberg bluegrass (22 to 26 percent) provide most of the perennial plant cover in Pasture 3. Cheatgrass cover ranged from 8 to 16 percent. However, the invasive plant indicator rated "moderate to extreme" due to cheatgrass being common throughout the site and pasture. Photos taken at the site support this conclusion. Wyoming big sagebrush was absent from the IIRH site and provided a small amount of cover (4 percent) at HAF Site P3-1. Both sites burned several

years ago; IIRH site burned in 1995 and HAF Site P3-1 burned in 1985. It has been 18 to 28 years since these areas have burned, and sagebrush should have established at these sites to a greater extent than what has occurred. Cheatgrass amounts and the lack of or reduced amounts of sagebrush influence the attribute rating (moderate) in Pasture 3. Although there are numerous (2013 NAIP) discrete islands of sagebrush in the pasture, many appear to be under the 20-acre threshold for mapping.

Since livestock management changed in 2011, cattle grazed Pasture 3 during the spring. Utilization was measured on crested wheatgrass. Use in Pasture 3 was mostly light with moderate use (41 to 60 percent) occurring in 2004 and 2006. Livestock use was not measured on crested wheatgrass in 2012 or 2013, but measured on Thurber's needlegrass in 2012 as well as in 2011. Utilization on crested wheatgrass ranged from 5 percent to 54 percent over the ten-year study period. Thurber's needlegrass was used at 4 percent in 2011 and 6 percent in 2012.

Noxious weeds were not noted at the IIRH, HAF, ESI, or production sites in Pasture 3. Litter amounts were slightly higher than expected at these sites, but it is providing cover for site protection and nutrient cycling is occurring. Since 2010, cheatgrass cover appears to be becoming more prominent throughout seeded vegetation. Sagebrush is not establishing into some areas of the pasture because of competition from seeded species. Therefore, the absence or reduced amounts of sagebrush and presence of cheatgrass is likely influencing seeded vegetation to function at a lower capacity to maintain life form diversity, production, native animal habitat, nutrient cycling, energy flow, and the hydrologic cycle.

Standard 5 Evaluation Finding: Evaluation Finding- Pasture 3 is:

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

Rationale for Evaluation Finding

The Biotic attribute rating for Pasture 3 is a "moderate" deviation from the ESD reference condition. The rating is due to reduced amounts of sagebrush cover and cheatgrass being common throughout the pasture.

Seven different wildfires have occurred in Pasture 3 since 1957, resulting in portions of the pasture seeded to crested wheatgrass. Shrubs are generally absent or present at low levels within the seeded plant communities. The functional/structural group indicator deviated from the ESD reference condition primarily because of the absence/reduction of Wyoming big sagebrush.

In contrast to Pastures 1, 2, and 5 where cheatgrass was scattered with higher densities in disturbed areas, cheatgrass was common throughout Pasture 3. Data collected in 2010 shows cheatgrass cover was minimal in portions of this pasture, but in 2013 it had become more common. Fires in the immediate area have opened up the vegetation community resulting in new weedy plant species or existing annuals to establish and spread. Further if a wildfire occurs in this pasture cheatgrass has the potential to become dominant. In addition, cheatgrass is prevalent in adjacent allotment pastures and may be contributing to the expansion of cheatgrass in Pasture 3. The increases and apparent spread of cheatgrass is a threat to the biotic integrity of seeded areas in Pasture 3.

Seedlings in Pasture 3 lack vertical structure due to a wildfire burning through it and removing shrubs present before the fire. Competition from seeded plant species seems to limit sagebrush reestablishment in Pasture 3. Use by native wildlife dependent on sagebrush for their habitat, such as the sage thrasher (*Oreoscoptes montanus*), sagebrush vole (*Lemmisca curtatus*), sagebrush lizard (*Sceloporus graciosus*), least chipmunk (*Neotamias minimus*), and Vesper sparrow (*Pooecetes gramineus*), is limited due to

competition from more aggressive seeded plants (i.e. ‘Secar’ Snake River wheatgrass and crested wheatgrass).

The seeded vegetation communities within Pasture 3 are currently not functioning to maintain life form diversity and native animal habitat. In time reduced shrub cover and continual increases in cheatgrass could impair the nutrient cycling, energy flow, and the hydrologic cycle capacity to function over time. Seeded areas within this pasture are not 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

No pastures contained large enough areas to warrant being evaluated under Standard 6. Areas mapped as annual on Map 3 are generally areas with steeper or rocky slopes that were not drill seeded following wildfires. These sites typically have some Sandberg bluegrass.

Standard 7 (Water Quality)

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

X Standard Doesn't Apply

No intermittent or perennial water bodies are present in the Juniper Ranch North Allotment. Therefore, Standard 7 does not apply.

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

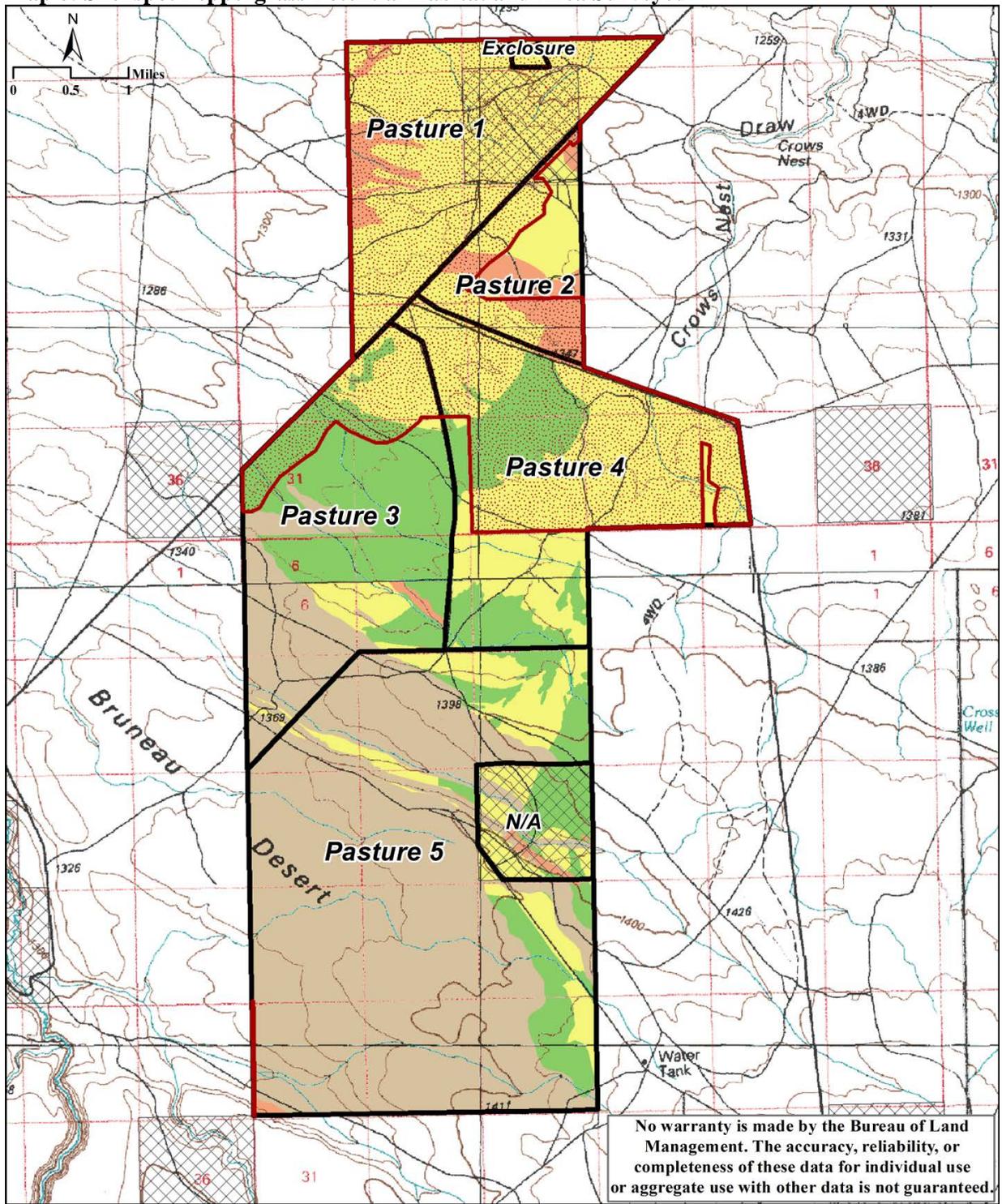
Habitats are suitable to maintain viable populations of threatened and endangered, sensitive, and other special status species.

Rangeland Health Assessment

Plants:

There are no known BLM sensitive plants within the Juniper Ranch North Allotment. In the Jarbidge Field Office special status plants are generally associated with distinct soil types that occur on the periphery of the field office. None of these soil types occur within the allotment based on SSURGO soil data (NRCS, 2012). Potential habitat occurs for one sensitive plant species, slickspot peppergrass (*Lepidium papilliferum*; Proposed Endangered, BLM sensitive species). Approximately 5,250 acres in the allotment have been surveyed for slickspot peppergrass; slickspots were noted but slickspot peppergrass plants have not been found in these or previous surveys. Systematic inventories for other special status plants have not been conducted in the allotment. No special status plant species have been recorded during other monitoring efforts (e.g., slickspot peppergrass inventories, IIRH field visits, sage-grouse habitat assessments, fire rehabilitation monitoring, etc.).

Map 8: Slickspot Peppergrass Potential Habitat and Area Surveyed



Slickspot peppergrass grows in the semiarid sagebrush-steppe ecosystem of southwestern Idaho. Interspersed within this habitat type, slickspot peppergrass can be found in visually distinct microsites known as slickspots (mini playas or natric sites) that act as small water basins and where the sodium and clay content is higher than adjacent, unoccupied habitat (Moseley, 1994). The Juniper Ranch North Allotment has 9,363 acres (60 percent of allotment) of potential slickspot peppergrass habitat (Map 8). A GIS model was developed to help focus inventory and clearance efforts to areas that would have a higher chance of finding slickspot peppergrass plants (BLM, 2012). This model used updated soils data, vegetation community data, fire frequency, slope, and elevation to further refine potential habitat and to categorize it into groups (high, medium, low, and non-habitat) that identify the potential for finding the species. The allotment has 3,030 acres of high potential, 609 acres of medium potential, and 5,724 acres of low potential, and 6,201 acres of non-habitat for slickspot peppergrass (Table 19). The nearest known occupied habitat for slickspot peppergrass is 4 miles southwest of Pasture 5.

Table 19: Slickspot Peppergrass Potential Habitat (Acres)

Pasture	High	Medium	Low	Non-habitat
1	0	208	1,600	0
2	0	329	579	0
3	1,574	28	515	841
4	831	24	2,312	0
5	624	19	675	5,357
Exclosure	0	0	43	0
N/A	0	1	0	3

Animals:

Presence of various sensitive wildlife species are based upon primarily incidental observations by BLM staff and data entered into the Idaho Natural Heritage Program database by other individuals. Species found on the Juniper Ranch North Allotment are discussed below.

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

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

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

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

In 2010, BLM developed the Sage-Grouse HAF to assess seasonal sage-grouse habitats at multiple scales (Stiver et al., 2010). Habitat suitability requirements were based on the following guidelines which were

published in 2000 and describe desired conditions for sage-grouse habitats during nesting and early brood rearing, late brood rearing, and winter:

- Nesting and early brood rearing habitat should support 15-25 percent canopy cover of sagebrush, perennial herbaceous cover should average at least 7” in height with at least 10 percent canopy cover for grasses and at least 5 percent for forbs and a diversity of forb species during spring (Connelly et al., 2000).
- Late brood rearing habitat should support 10-25 percent canopy cover of sagebrush. Riparian areas or wet meadows in the general area improve habitat for sage-grouse (Connelly et al., 2000).
- Winter habitat should have 10-30 percent canopy cover of sagebrush with at least 10-14” exposed above the snow (Connelly et al., 2000).

Based on vegetation mapping from 2013, the allotment contains 2,170 acres mapped as sagebrush (14 percent of the allotment). Sagebrush occurs in Pasture 3 (396 acres, 13 percent of pasture), Pasture 4 (661 acres, 21 percent of pasture), and Pasture 5 (1,150 acres, 17 percent of pasture). The Crows Nest Fire of 1985, Tuanna Fire of 1995, Doe Fire of 1999, Crimson and Clover Fire of 2000, Big Crow Fire of 2002, Sailor Cap Fire of 2006, and Long Butte Fire of 2010 have eliminated most of the sagebrush in the allotment. Following the fires the BLM aerial seeded sagebrush. Where sagebrush has been reseeded, recovery of the sagebrush community needed for sage-grouse is expected to take one (Wambolt and Payne, 1986) to several (Baker, 2006; Baker, 2011) decades assuming there are no more fires.

Sage-grouse have been observed in the adjoining allotment year round. Sage-grouse habitat extends from the Juniper Ranch North Allotment into the Clover Crossing Allotment to the west and Horse Butte AMP Allotment to the east (Map 9). The Juniper Ranch North Allotment has two undetermined (due to a lack of recent surveys) sage-grouse leks. Within five miles of the allotment there are 7 occupied, 14 undetermined, and 3 unoccupied sage-grouse leks (Map 9). Sage-grouse attendance at occupied leks within five miles of the allotment is shown in Table 20. Leks are considered occupied if there has been documented sage-grouse activity within the past five years.

Table 20: Sage-grouse Attendance at Occupied Leks within Five Miles of Juniper Ranch North Allotment, 2000-2014

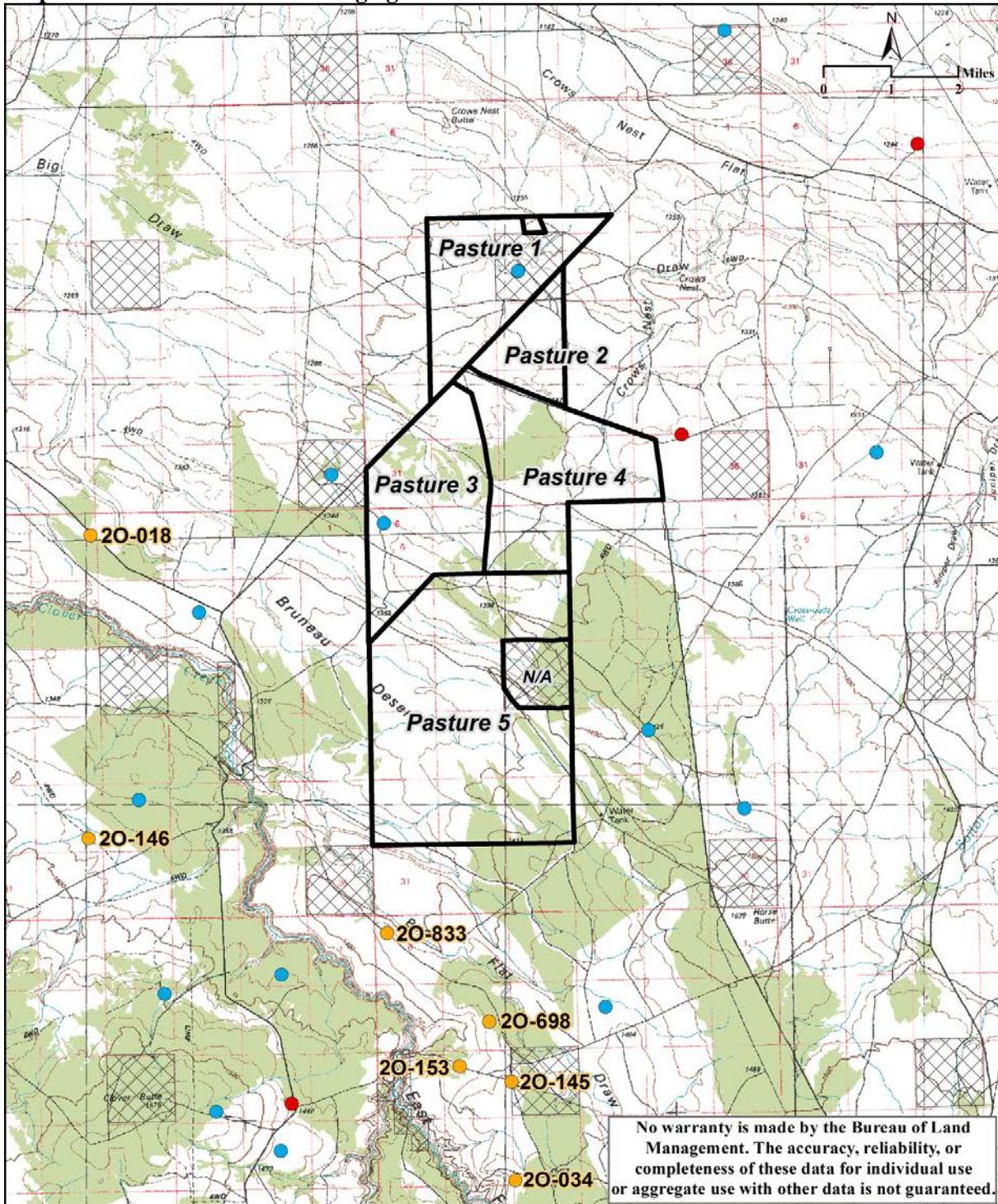
Lek	Location	Survey Year ¹														
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
20-833	1.3 mile S													9	--*	19
20-146	2.5 miles W	6	7	0	--	0	--	--	16	--	--	0	0	--	--	8
20-698	2.6 miles S								7	--	--	3	0	0	--	--
20-153	3.3 miles S										3	12	--	--	0	0
20-145	3.5 miles S	22	21	6	--	24	32	10	33	25	19	22	0	22	19	33
20-018	4.1 miles W	1	--	0	--	--	--	20	26	--	--	12	--	--	0	0
20-034	5.0 miles S						1	--	8	--	--	3	--	0	--	--

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

Nesting and Early Brood Rearing Habitat

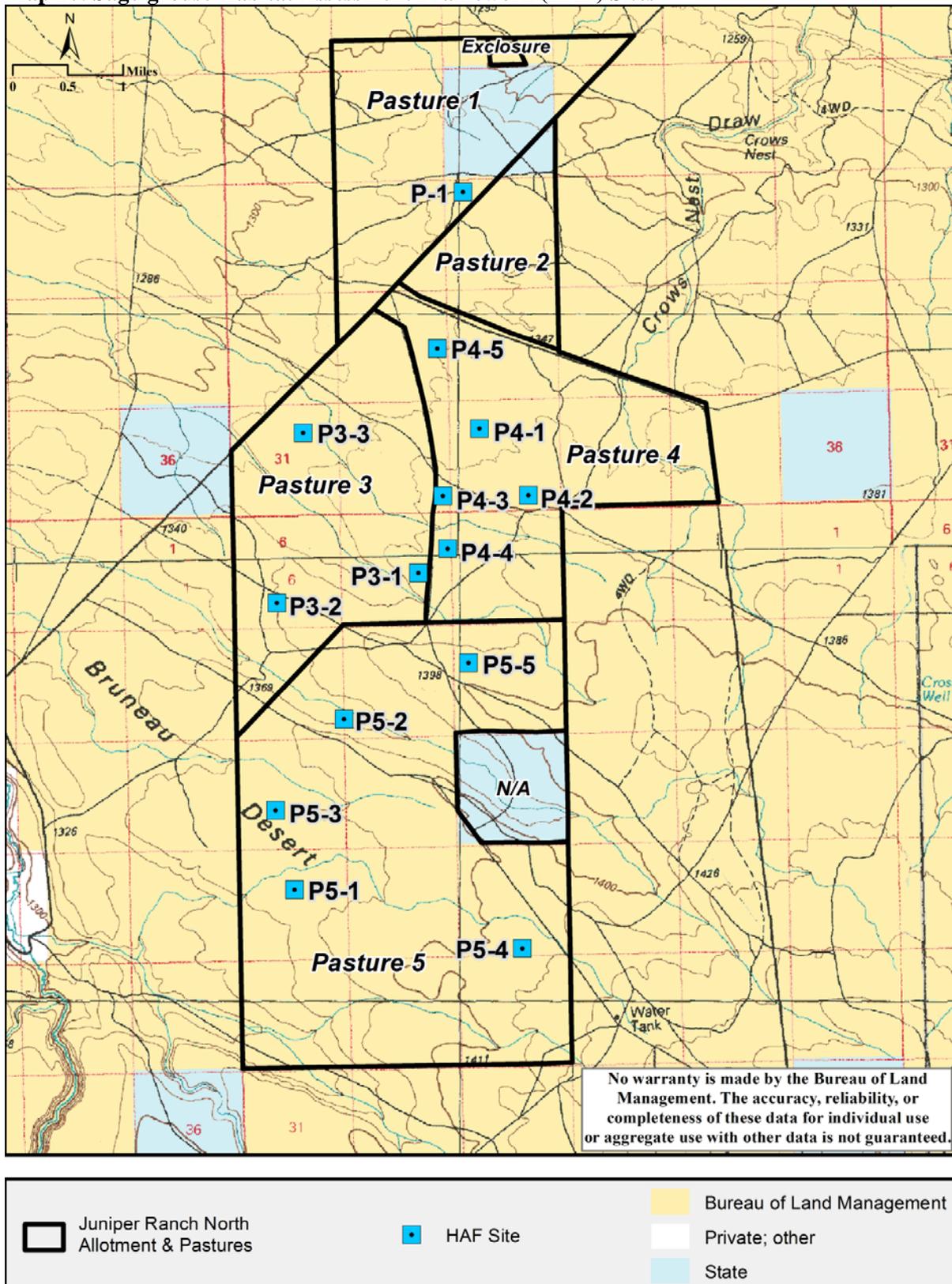
The current conditions of sage-grouse seasonal habitats were assessed following protocols outlined in the Sage-grouse Habitat Assessment Framework (Stiver et al., 2010). Sage-grouse habitat suitability assessments were conducted in 2010 at P1 (Pasture 1), P3-1 (Pasture 3), P4-1 and P4-3 (Pasture 4), and P5-4 (Pasture 5). Assessments were conducted in 2011 at P3-3 (Pasture 3) and in 2013 at P3-2 (Pasture 3), P4-2, P4-4, and P4-5 (Pasture 4), and P5-1, P5-2, P5-3, and P5-5 (Pasture 5) (Map 10).

Map 9: Shrubland Habitat and Sage-grouse Leaks



Juniper Ranch North Allotment & Pastures	Shrubland	Management Status
Non-BLM Land		Occupied
		Undetermined
		Unoccupied

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



Sage-grouse droppings were observed during the habitat suitability assessments at P4-2, P4-4, and P4-5; however, no sign was observed at the other sites during the assessments. Sage-grouse droppings were observed during the IIRH field visits at P4-1 and P5-4. Sage-grouse habitat suitability assessments are not necessarily an indication of rangeland health; they are merely indicators of habitat suitability. However, vegetation data collected as part of the habitat suitability assessments may be used to inform and interpret other rangeland health information and observations. Sage-grouse habitat suitability assessments are shown in Table 21.

Table 21: Sage-grouse Habitat Assessment Worksheet for Nesting/Early Brood Rearing Habitat (Arid Site)

Habitat Indicator	Suitable Habitat	Marginal Habitat	Unsuitable Habitat
	15 – 25%	10 - < 15% or > 25%	< 10%
Average Sagebrush Canopy Cover	P3-3(17%), P4-1(23%)		P1 (trace), P3-1(4%), P3-2(0%), P4-2(2%), P4-3(trace), P4-4(0%), P4-5(4%), P5-1(0%), P5-2(0%), P5-3(0%), P5-4(trace), P5-5(8%)
	12 - 30"	10 -11" or >30"	< 10"
Average Sagebrush Height	P4-2(26"), P4-5(31"), P5-5(20")	P3-1(40"), P3-3(32"), P4-1(33")	P1(0"), P3-2(0"), P4-3(0"), P4-4(0"), P5-1(0"), P5-2(0"), P5-3(0"), P5-4(0")
	Spreading	Mix of spreading and columnar	Columnar
Sagebrush Growth Form	P1, P4-3, P4-5, P5-5	P3-1, P3-3, P4-1	P3-2, P4-2, P4-4, P5-1, P5-2, P5-3, P5-4
	≥ 7"	5 - < 7"	< 5"
Average Grass Height	P1 (11"), P3-1(8"), P4-1(8"), P5-1(9"), P5-3(11"), P5-4(12")	P4-2 (5.0"), P4-3(5.5"), P4-4(5.6") P4-5(5.0"), P5-2(5.8"),	P3-2(1.9"), P3-3(3.9"), P5-5(3.0")
	≥ 10%	5 - < 10%	< 5%
Average Perennial Grass Canopy Cover	P1 (50%), P3-1(50%), P3-2(36%), P3-3(25%), P4-1(49%), P4-2(65%), P4-3(50%), P4-4(75%), P4-5(56%), P5-1(65%), P5-2(40%), P5-3(49%), P5-4(48%), P5-5(63%)		
	≥ 5%	3 - < 5%	< 3%
Average Forb Canopy Cover	P4-2(11%), P4-4(19%), P4-5(6%)	P4-1(3%), P3-1(4%), P4-3(4%), P5-2 (4%), P5-5(3%)	P1 (trace), P3-2(1%), P3-3(1%), P5-1(2%), P5-3(1%), P5-4(trace)
	Forbs common with at least a few preferred species common	Forbs common, but only 1 or 2 preferred species present	Forbs rare to sparsely present
Preferred Forb Abundance and Diversity	P3-3, P4-1, P4-2, P4-4	P3-1, P4-3, P4-5, P5-5	P1, P3-2, P5-1, P5-2, P5-3, P5-4
Overall Site Evaluation	P4-1		P1, P3-2, P3-3, P4-2, P4-3, P4-4, P4-5, P5-1, P5-2, P5-3, P5-4
Pasture Evaluation			Pasture 1, Pasture 2, Pasture 3, Pasture 4, Pasture 5

Pasture 1 contained one HAF site. HAF site P1 is in an area mapped as a crested wheatgrass vegetation community. Wildfires have eliminated most of the sagebrush in the pasture making it unsuitable for sage-grouse. Only trace levels of young sagebrush were observed during the assessment. Grass height and perennial grass canopy cover rated suitable. Only six species of perennial forbs were observed and they occurred at trace levels. The only common forb species was sagebrush phlox. Cheatgrass was measured at

24 percent cover (cover values reported are for all layers). Over time cheatgrass will limit native perennial and annual forbs and increase fine fuels making wildfires more likely. The entire pasture has burned four times since 1985.

Pasture 2 was not assessed using the HAF. The entire pasture has burned three times since 2006 and is currently mapped as recent burn. Without sagebrush the pasture is unsuitable as sage-grouse habitat.

Pasture 3 contained three HAF sites. HAF site P3-1 is in the southeastern portion of the pasture in a crested wheatgrass vegetation community. HAF site P3-2 is in the southwestern part of the pasture in an area also mapped as a crested wheatgrass vegetation community. HAF site P3-3 is in the northwestern portion of the pasture in an area mapped as a Wyoming sagebrush/ Sandberg bluegrass vegetation community. Attributes at HAF site P3-1 were rated suitable for grass height and cover, marginal for sagebrush height, growth form, forb canopy cover, and preferred forb abundance and diversity, and unsuitable for sagebrush canopy cover. Six species of forbs were observed and they occurred at low density. The only common forb observed was sagebrush phlox. Cheatgrass was recorded at 16 percent cover (all layers).

Attributes at HAF site P3-2 were rated unsuitable for all habitat indicators except for grass cover (suitable). Three species of forbs were observed and they occurred at low density (0.63 forbs per 0.1 m² plot). The only common forb was sagebrush phlox. Cheatgrass was recorded at 17 percent cover (all layers).

Attributes at HAF site P3-3 rated suitable for sagebrush cover, perennial grass canopy cover, and preferred forb abundance and diversity. Sagebrush height and growth form rated marginal while grass height and forb canopy cover were rated unsuitable. Although average forb canopy cover was unsuitable, the site rated suitable for preferred forb abundance and diversity with seven species of forbs observed. Forbs occurred at high density (5.92 forbs per 0.1 m² plot). The most common forbs were sagebrush phlox, fleabane (*Erigeron* spp.), tapertip onion (*Allium acuminatum*), milkvetch (*Astragalus* spp.), spiny phlox, and longleaf phlox. Cheatgrass was recorded at 21 percent cover (all layers).

Pasture 3 is predominately mapped as a crested wheatgrass vegetation community. Areas mapped as sagebrush extend across the north central portion of the pasture and across the southeastern corner of the pasture (13 percent of the pasture). In addition, the 2013 NAIP satellite imagery shows extensive areas of scattered patches of sagebrush and rabbitbrush. These patches are found throughout the entire pasture. Many of these patches do not appear on the vegetation map because the patch size does not meet the minimum mapping unit of ≥ 20 acres or the patch does not contain ≥ 10 percent shrub cover. While patches of sagebrush and rabbitbrush may provide some habitat for nesting, most of the pasture does not contain shrubs of sufficient density for sage-grouse nesting. Cheatgrass ranged from 16 to 21 percent cover and forbs were limited on two of the three sites. Overall, Pasture 3 is unsuitable for sage-grouse during nesting and early brood rearing.

Pasture 4 contained five HAF sites. HAF sites P4-1 and P4-4 are in areas mapped as Wyoming sagebrush/ Sandberg bluegrass vegetation communities. HAF sites P4-2, P4-3, P4-5 are located in areas mapped as annual vegetation communities. Attributes at HAF site P4-1 were rated suitable for sagebrush canopy cover, grass height, perennial grass canopy cover, and preferred forb abundance and diversity. The remaining habitat indicators were all rated marginal. Sixteen species of forbs were observed and they occurred at high density. The most common forbs were sagebrush phlox and spiny phlox. Cheatgrass was recorded at 2 percent cover (all layers).

Attributes at HAF site P4-2 were rated suitable for all habitat indicators except for grass height (marginal), sagebrush cover (unsuitable), and sagebrush growth form (unsuitable). Four species of forbs

were observed and they occurred at high density (5.84 forbs per 0.1 m² plot). The most common forbs were sagebrush phlox and longleaf phlox. Cheatgrass was recorded at 23 percent cover (all layers).

Attributes at HAF site P4-3 rated suitable for sagebrush growth form and perennial grass canopy cover. Grass height, forb canopy cover, and preferred forb abundance and diversity were all rated marginal and sagebrush canopy cover and height were rated unsuitable. Four species of forbs were observed and the only common forb was sagebrush phlox. The lack of sagebrush and substantial amounts of non-native annuals reduce habitat suitability at the site. Cheatgrass was recorded at 24 percent cover (all layers).

Attributes at HAF site P4-4 were rated suitable for perennial grass cover, forb canopy cover, and preferred forb abundance and diversity. Grass height was rated marginal and sagebrush indicators were all rated unsuitable. Eight species of forbs were observed and they occurred at high density (7.63 forbs per 0.1 m² plot). Cheatgrass was not recorded along the transects at the site. Attributes at HAF site P4-5 rated suitable for all habitat indicators except for sagebrush canopy cover (unsuitable), grass height (marginal), and preferred forb abundance and diversity (marginal). Six species of forbs were observed and they occurred at low density (0.60 forbs per 0.1 m² plot). Cheatgrass was recorded at 26 percent cover (all layers).

Pasture 4 contains a mixture of areas mapped as crested wheatgrass, annual grasslands, and sagebrush. Areas mapped as sagebrush extend across the central portion of the pasture and across the southern portion of the pasture (21 percent of the pasture). In addition, the 2013 NAIP satellite imagery shows areas of scattered patches of sagebrush and rabbitbrush in the northern and southern portions of the pasture. Many of these patches do not appear on the vegetation map because the patch size does not meet the minimum mapping unit of ≥ 20 acres or the patch does not contain ≥ 10 percent shrub cover. While patches of sagebrush and rabbitbrush may provide some habitat for nesting, the majority of the pasture does not contain shrubs of sufficient density for sage-grouse nesting. Cheatgrass ranged from 0 to 27 percent cover. Preferred forb abundance and diversity rated suitable on three of the five sites with the remaining sites being rated marginal. Overall, Pasture 4 is unsuitable as sage-grouse nesting and early brood rearing habitat.

Pasture 5 contained five HAF sites. HAF site P5-1 and P5-4 are in areas mapped as bluebunch wheatgrass vegetation communities. HAF sites P5-2 and P5-3 are in areas mapped as crested wheatgrass vegetation communities. HAF site P5-5 is in an area mapped as Wyoming sagebrush/Thurber's needlegrass vegetation community. Attributes at HAF site P5-1 were rated unsuitable for all habitat indicators except for grass height and cover (both suitable). Eleven species of forbs were observed but they occurred at low density (0.32 forbs per 0.1 m² plot). The only common forb was sagebrush phlox. Cheatgrass was recorded at 12 percent cover (all layers).

Attributes at HAF site P5-2 were rated suitable for grass cover, marginal for grass height and forb canopy cover, and unsuitable for the remaining habitat indicators. Fourteen species of forbs were observed by they occurred at low density (0.32 forbs per 0.1 m² plot). The only common forb was sagebrush phlox. Cheatgrass was not recorded along the transects at the site.

Attributes at HAF site P5-3 were rated unsuitable for all habitat indicators except for grass height and cover (both suitable). Only, three species of forbs were observed and they occurred at low density (0.11 forbs per 0.1 m² plot). Cheatgrass was recorded at 19 percent cover (all layers).

Attributes at HAF site P5-4 were rated unsuitable for all habitat indicators except for sagebrush growth form (suitable), grass height (suitable), and perennial grass canopy cover (suitable). Six species of forbs were observed and they occurred at low density. The only common forb was sagebrush phlox. Cheatgrass was recorded at 2 percent cover (all layers).

Attributes at HAF site P5-5 rated suitable for sagebrush height, sagebrush growth form, and perennial grass canopy cover. Average forb canopy cover and preferred forb abundance and diversity were rated marginal. Sagebrush canopy cover and grass height were both rated unsuitable. Eight species of forbs were observed and they occurred at low density (1.06 forbs per 0.1 m² plot). Cheatgrass was recorded at 9 percent cover (all layers).

Pasture 5 contains a mixture of areas mapped as crested wheatgrass, 'Secar' Snake River wheatgrass, annual grasslands, and sagebrush. Sagebrush is found in patches in the northern portion of the pasture and in the southern portion of the pasture (17 percent of the pasture). Cheatgrass ranged from 0 to 20 percent cover. Forbs were limited across the pasture with four of the five sites being rated unsuitable for preferred forb abundance and diversity. Overall, Pasture 5 is unsuitable as sage-grouse nesting and early brood rearing habitat.

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

Late Brood Rearing Habitat

No late brood rearing habitat is present in the allotment. No springs, wetlands, or areas with riparian vegetation occur within the allotment. The allotment does not contain areas where moisture collects to maintain forbs throughout the summer.

Winter Habitat

Wildfire has removed sagebrush across most of the allotment making it generally unsuitable as wintering habitat for sage-grouse. 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).

Pastures 1 and 2 are perennial grasslands that do not contain areas mapped as sagebrush. Pastures 3, 4, and 5 each contain sagebrush patches which provide some wintering habitat. Pasture 3 has patches of sagebrush which extend across the north central portion of the pasture and across the southeast corner of the pasture (13 percent of pasture). In addition, the entire pasture contains scattered rabbitbrush and sagebrush. However, these scattered rabbitbrush and sagebrush plants and patches are generally small (<20 acres) or do not contain enough cover (≥10 percent cover) for wintering sage-grouse. Pasture 4 has patches of sagebrush which extend across the central portion of the pasture and across the southern portion of the pasture (21 percent of the pasture). Pasture 5 also contains patches of sagebrush in the northern and southern portions of the pasture (17 percent of the pasture).

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 two to four 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 (*Urocitellus* spp.), black-tailed jackrabbit (*Lepus californicus*), mountain cottontail (*Sylvilagus nuttalli*), and pocket gopher (*Thomomys talpoides*). Fledgling birds, reptiles and insects constitute a small percent of the diet (Bechard and Schmutz, 1995).

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

There was a ferruginous hawk nest on the loading chute of the corral in Pasture 4 but the nest was removed by someone in 2008 (F40; Table 22). No other nests are present in the allotment. Juniper, the preferred nest substrate for ferruginous hawks locally, is not present in the allotment.

Table 22: Ferruginous Hawk Nest Data

Nest	Survey Year ¹													08	09	10	11	12	13
	95	96	97	98	99	00	01	02	03	04	05	06	07						
F40					--	--	A	--	--	--	--	--	I	Nest Removed By Unknown					

¹Blanks indicate the nest had not yet been identified; in years marked by dashes (--) the nest was not surveyed. 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.

Pastures 1 and 2 of the allotment are dominated by crested wheatgrass which provides marginal habitat for mammalian prey (black-tailed jackrabbit, mountain cottontail, ground squirrels, etc.) favored by ferruginous hawks. Pastures 3, 4, and 5 contain a mixture of exotic annual grasslands, perennial grasslands, and native shrubland. Overall, these pastures were also rated marginal for ferruginous hawk foraging.

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 percent), with spiny hopsage (*Grayia spinosa*) (10 percent), antelope bitterbrush (*Purshia tridentata*) (6 percent), and rabbitbrush (*Chrysothamnus viscidiflorus*) (3 percent) (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).

Pastures 1 and 2 are perennial grasslands that do not contain areas mapped as shrubs. Some scattered rabbitbrush plants occur throughout these pastures but they occur at low densities. Sagebrush plants are uncommon in these pastures. Only three sagebrush plants were observed during the IIRH field visit to the HAF site in Pasture 1. Without shrubs of adequate height and density, Pastures 1 and 2 are unsuitable for Brewer’s sparrow nesting.

Pasture 3 contains areas mapped as sagebrush which provide suitable nesting habitat which extend across the north central portion of the pasture and across the southeast corner of the pasture (13 percent of pasture). In addition, the 2013 satellite imagery shows the entire pasture contains scattered rabbitbrush and sagebrush. These scattered rabbitbrush and sagebrush plants and patches occur at densities suitable for nesting. Overall, Pasture 3 was rated suitable as nesting habitat for Brewer’s sparrows.

Pasture 4 has a mixture of areas mapped as crested wheatgrass, annual grasslands, and sagebrush. Areas mapped as sagebrush provide suitable nesting across the central portion of the pasture and across the southern portion of the pasture (21 percent of the pasture). In addition, the 2013 satellite imagery shows areas of scattered patches of sagebrush and rabbitbrush in the northern and southern portions of the pasture. Shrubs are limited in the rest of the pasture. Taking into account the areas mapped as sagebrush,

the areas of scattered rabbitbrush and sagebrush, and the remaining area where shrubs are limited, the pasture rated marginal for Brewer's sparrow nesting.

Pasture 5 contains patches of sagebrush which provide suitable nesting habitat in the northern and southern portions of the pasture (17 percent of the pasture). In addition, the 2013 satellite imagery shows areas of scattered rabbitbrush and sagebrush. Shrubs are limited in the central portion of the pasture. Overall, Pasture 5 rated marginal for Brewer's sparrow nesting.

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.

Nesting habitat for loggerhead shrikes in the allotment is limited to areas containing shrubs of sufficient height for nesting. Wildfires have eliminated most shrubs from Pastures 1 and 2 making them unsuitable for nesting. Pasture 3 contained shrubs of sufficient height for nesting across most of the pasture (average sagebrush height ranged from 32-40", tallest sagebrush on transect was 46"). Pastures 4 contained shrubs of sufficient height for nesting across portions of the pasture (HAF site P4-1 contained two sagebrush plants on transect >45"). Shrubs in Pasture 5 are shorter in height (HAF site P5_5 contained average sagebrush height of 20", tallest sagebrush on transects was 28") than those preferred by loggerhead shrikes for nesting. Overall, Pastures 1 and 2 are unsuitable, Pasture 3 is suitable, and Pastures 4 and 5 are marginal 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 sparrows nest in shrubs, in bunchgrasses or occasionally on the ground at the base of a shrub (Martin and Carlson, 1998). The nest shrub is usually taller than the surrounding vegetation (Martin and Carlson, 1998). In Idaho sagebrush sparrows nest in big sagebrush, however, in Oregon they may also use antelope bitterbrush, rabbitbrush, greasewood (*Sarcobatus vermiculatus*) and bunchgrasses (Martin and Carlson, 1998). In general sagebrush sparrow nests are placed closer to the main stem than the edge of the shrub. In shrubs the nest can range from 9 to 11 inches above the ground. Sagebrush sparrows feed on seeds, insects, spiders, fruits, and succulent vegetation (Martin and Carlson, 1998).

Sagebrush sparrows have been observed in areas of sagebrush in the allotment. Pastures 1 and 2 have burned numerous times in wildfires and are unsuitable for sagebrush sparrow nesting. Pasture 3 is suitable for nesting since the pasture contains both dense sagebrush patches and the entire pasture contains scattered rabbitbrush and sagebrush. Pastures 4 and 5 are marginal for nesting since they contain both areas of dense sagebrush patches and areas of perennial grasslands with limited shrubs.

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

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

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

Pygmy rabbit surveys have not been conducted in Pastures 1 through 5 in the allotment. No pygmy rabbit burrows were observed at any of the sage-grouse HAF sites. However, surveys conducted to the south in Pastures 6 and 9 of the Juniper Ranch Allotment have documented old burrow complexes.

Pastures 1 and 2 are predominately perennial grasslands that do not provide habitat for pygmy rabbits. Areas of dense sagebrush in Pastures 3, 4, and 5 provide limited areas of suitable habitat. In general, areas of dense sagebrush are somewhat isolated (i.e., surrounded by perennial grasslands with limited shrubs) from other areas containing dense sagebrush. Overall, Pastures 3, 4, and 5 are unsuitable for pygmy rabbits since sagebrush of suitable height and density is absent across the majority of these pastures.

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.

Pastures 1 and 2 contain marginal habitat for Piute ground squirrels. Wildfires have converted shrub-steppe habitats in these pastures to perennial grass and exotic annual communities. Cheatgrass communities can support ground squirrel populations, but populations in such areas are more susceptible to drought and therefore provide less stable prey populations than those in shrub and perennial grass mosaics (Yensen et al., 1992; Van Horne et al., 1997). Pastures 3, 4, and 5 contain a mixture of exotic annual grasslands, perennial grasslands, and patches of sagebrush steppe. Due to the high amount of cheatgrass found throughout these pastures, they were also rated marginal for Piute ground squirrels.

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

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

Tall cliffs that would provide suitable roosting habitat for spotted bats are not present in the allotment. Potential roosting habitat lies along the cliffs associated with Clover Creek which is 1.4 mile to the west of Pasture 5 (outside the allotment). Spotted bats may forage over the allotment. Watering locations for spotted bats in the allotment are limited to livestock troughs which contain water when livestock are present. No intermittent or perennial water bodies are present within the allotment.

Evaluation of Standard 8

There are no known BLM sensitive or federally listed plants within the Juniper Ranch North Allotment. Approximately 5,250 acres in the allotment have been surveyed for slickspot peppergrass. However, systematic inventories for other special status plants have not been conducted in the allotment. GIS modeling predicts that the allotment contains 3,030 acres of high potential, 609 acres of medium potential, and 5,724 acres of low potential habitat for slickspot peppergrass. The nearest known occupied habitat for slickspot peppergrass is 4 miles southwest of Pasture 5.

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

Habitat for BLM sensitive wildlife species occurs within the allotment. Overall habitat ratings for each species by pasture are shown in Table 23.

Table 23: Overall Habitat Suitability for BLM Sensitive Wildlife Species by Pasture

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

S = Suitable (combination of components make the habitat suitable), M = Marginal (some habitat components are missing), U = Unsuitable (one or more critical habitat components are missing).

Overall, sage-grouse nesting and early brood rearing habitat is unsuitable in all pastures. Patches of sagebrush and rabbitbrush occur in Pastures 3, 4, and 5. Cheatgrass was common in Pasture 3 and scattered throughout Pastures 4 and 5. No late brood rearing habitat is found on this allotment. Some areas of wintering habitat are present in the remaining patches of sagebrush in Pastures 3, 4, and 5. Because sagebrush habitat is so limited in Pastures 3, 4, and 5, they were rated unsuitable as sage-grouse winter range.

Juniper, the preferred nest substrate for ferruginous hawks locally, is not present in the allotment. All pastures in the allotment were rated marginal for habitat that supports prey species hunted by ferruginous hawks.

Pastures 1 and 2 are perennial grasslands that do not contain areas mapped as shrubs. Without shrubs, Pastures 1 and 2 were rated unsuitable for Brewer’s sparrow, loggerhead shrike, and sagebrush sparrow nesting. Scattered rabbitbrush and sagebrush occurs throughout Pasture 3 which provides suitable nesting

habitat for these species. Pastures 4 and 5 were rated marginal for nesting by these species since these pastures contain a mixture of sagebrush and areas of perennial grasslands where shrubs are limited.

Pastures 1 and 2 are predominately perennial grasslands that do not provide habitat for pygmy rabbits. Areas of dense sagebrush in Pastures 3, 4, and 5 provide limited areas of suitable habitat. In general, areas of dense sagebrush are somewhat isolated (i.e., surrounded by perennial grasslands with limited shrubs) from other areas containing dense sagebrush. Overall, Pastures 3, 4, and 5 are unsuitable for pygmy rabbits since sagebrush of suitable height and density is absent across the majority of these pastures. All pastures in the allotment were rated marginal for Piute ground squirrel habitat.

Spotted bat roosting habitat was rated unsuitable since the allotment does not contain cliffs for roosting. The allotment was rated suitable for spotted bat foraging due to its proximity to roosting habitat and the likelihood that bats forage over the allotment. Clover Creek which is 1.4 mile to the west of Pasture 5 (outside the allotment) provides roosting, foraging, and watering locations for spotted bats.

Standard 8 Evaluation Finding – Allotment is:

Meeting the Standard

Not meeting the Standard, but making significant progress towards meeting

Not meeting the Standard

Rationale for Evaluation Finding

The Crows Nest Fire of 1985, Tuanna Fire of 1995, Doe Fire of 1999, Crimson and Clover Fire of 2000, Big Crow Fire of 2002, Sailor Cap Fire of 2006, and Long Butte Fire of 2010 have eliminated the majority of sagebrush in the allotment. The only remaining areas mapped as sagebrush occur in Pasture 3 (396 acres, 13 percent of pasture), Pasture 4 (661 acres, 21 percent of pasture), and Pasture 5 (1,150 acres, 17 percent of pasture). Pastures 1 and 2 do not contain areas mapped as sagebrush. The loss of sagebrush habitat across large areas of the allotment has impacted sage-grouse or other sagebrush dependent special status species. Without adequate sagebrush cover, sage-grouse are less able to find suitable nest sites and successfully hatch broods because they are more exposed to predators. Additionally, the reduced forb abundance in portions of the allotment reduces forage availability for nesting sage-grouse and newly hatched chicks. The reduced cover and abundance of sagebrush and forbs would reduce sage-grouse use of the allotment and reduce reproductive success of sage-grouse that do attempt to nest within the allotment.

Similarly other shrub steppe obligate species lack adequate sagebrush required for nesting and associated forage and prey base needs within this allotment. Therefore these species would have reduced reproductive success if they use the allotment or they would have to find suitable habitats outside of the allotment.

Cheatgrass is found throughout the Juniper Ranch North Allotment. Cover values for cheatgrass ranged from 0 to 27 percent with the majority of HAF sites in the 12 to 27 percent cover range (cover values reported are for all layers). Cheatgrass can limit native perennial and annual forbs and increase fine fuels making wildfires more likely. Future wildfires will further reduce sagebrush and impede the reestablishment of sagebrush in this allotment. Pastures in the Juniper Ranch North Allotment are not meeting Standard 8.

LITERATURE CITED

- Adams, R. A. (2003). *Bats of the Rocky Mountain West*. Bolder, CO: University Press of Colorado.
- Baker, W. L. (2006). Fire and Restoration of Sagebrush Ecosystems. *Wildlife Society Bulletin*, 34(1), 177-185.
- Baker, W. L. (2011). Chapter 11: Pre-Euro-American and Recent Fire in Sagebrush Ecosystems. pp. 185-203. In S. T. Knick and J. W. Connelly (Eds.), *Greater Sage-Grouse: Ecology and Conservation of a Landscape Species and Its Habitats* (pp. 185-203). *Studies in Avian Biology Series* (Vol. 38), Berkeley, CA: University of California Press.
- Bechard, M. J., and J. K. Schmutz. (1995). Ferruginous Hawk (*Buteo regalis*), No. 172. In A. Poole (Ed.), *The Birds of North America Online*. Ithaca, NY: Cornell Laboratory of Ornithology, Retrieved in March, 2014 from: <http://bna.birds.cornell.edu/bna/species/172>.
- BLM. (1987). Jarbidge Resource Management Plan. Boise, ID: USDI, Bureau of Land Management.
- BLM. (1996). Sampling Vegetation Attributes. Interagency Technical Reference 1734-4.
- BLM. (1998). A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas. BLM Technical Reference 1737-15.
- BLM. (2012). Slickspot Peppergrass Occurrence Potential Model (GIS). Twin Falls, ID: USDI, Bureau of Land Management, Jarbidge Field Office.
- Brady, N. C., & Weil, R. R. (2000). *Elements of the nature and properties of soils*. Upper Saddle River, NJ: Prentice-Hall Inc.
- Brewer, T. K., J. C. Mosley, D. E. Lucas, and L. R. Schmidt. (2007). Bluebunch Wheatgrass Response to Spring Defoliation on Foothill Rangeland. *Rangeland Ecology and Management* 60:498–507.
- Cardon, Z. G., Stark, J. M., Herron, P. M., & Rasmussen, J. A. (2013). Sagebrush carrying out hydraulic lift enhances surface soil nitrogen cycling and nitrogen uptake into inflorescences. *Proceedings of the National Academy of Sciences*, 110(47), 18988-18993.
- Connelly, J. W., M. A. Schroeder, A. R. Sands, and C. E. Braun. (2000). Guidelines to Manage Sage Grouse Populations and their Habitats. *Wildlife Society Bulletin* 28(4): 967–985.
- Conover, M. R., J. S. Borgo, R. E. Dritz, J. B. Dinkins, and D. K. Dahlgren. (2010). Greater Sage-grouse Select Nest Sites to Avoid Visual Predators but not Olfactory Predators. *Condor* 112:331–336.
- Cook, C. W., & Lewis, C. E. (1963). Competition between big sagebrush and seeded grasses on foothill ranges in Utah. *Journal of Range Management*, 245-250.
- Cooperative Extension Service, USDA, and NRCS. (1999). Utilization Studies and Residual Measurements. Interagency Technical Reference 1734-3.
- Daubenmire, R. F. (1940). Plant Succession Due to Overgrazing in the Agropyron Bunchgrass Prairie of Southeastern Washington. *Ecology* 21:55–64.

- Eldridge, D. J., & Rosentreter, R. R. (2004). Shrub mounds enhance water flow in a shrub-steppe community in southwestern Idaho, USA. *Seed and soil dynamics in shrubland ecosystems. Ogden, Utah: USDA Forest Service RMRS-P-31*, 77-83.
- Finley, C. D., & Glenn, N. F. (2010). Fire and vegetation type effects on soil hydrophobicity and infiltration in the sagebrush-steppe: II. Hyperspectral analysis. *Journal of arid environments*, 74(6), 660-666.
- Frischknecht, N. C. (1963). Contrasting effects of big sagebrush and rubber rabbitbrush on production of crested wheatgrass. *Journal of Range Management*, 70-74.
- Green, J. S., and Flinders, J. T. (1980). *Brachylagus idahoensis*, No. 125. Washington, DC: American Society of Mammalogists.
- Heady, L. T., and J. W. Laundré. (2005). Habitat Use Patterns Within the Home Range of Pygmy Rabbits (*Brachylagus idahoensis*) in Southeastern Idaho. *Western North American Naturalist* 65(4):490–500.
- Hilty, J. H., Eldridge, D. J., Rosentreter, R., Wicklow-Howard, M. C., & Pellant, M. (2004). Recovery of biological soil crusts following wildfire in Idaho. *Rangeland Ecology & Management*, 57(1), 89-96.
- Holechek, J. L., Pieper, R. D., & Herbel, C. H. (1995). *Range management: principles and practices* (No. Ed. 2). Prentice-Hall.
- Holloran, M. J., B. J. Heath, A. G. Lyon, S. J. Slater, J. L. Kuipers, and S. H. Anderson. (2005). Greater Sage-grouse Nesting Habitat Selection and Success in Wyoming. *Journal of Wildlife Management* 69:638–649.
- Homer, C. G., T. C. Edwards, Jr., R. D. Ramsey, and K. P. Price. (1993). Use of Remote Sensing Methods in Modelling Sage Grouse Winter Habitat. *Journal of Wildlife Management* 57:78–84.
- IDEQ. (2014). Idaho Department of Environmental Quality Final 2012 Integrated Report. Boise, ID: Idaho Department of Environmental Quality.
- Johansen, J. R. 1993. Cryptogamic crusts of semiarid and arid lands of North America. *Journal of Phycology*. 29(2):140-147.
- Knick, S. T., and J. W. Connelly. (2011). Greater Sage-grouse and Sagebrush: an Introduction to the Landscape. In S. T. Knick and J.W. Connelly (Eds.), *Greater Sage-grouse Ecology and Conservation of a Landscape Species and Its Habitats* (pp. 1-9). Berkeley, CA: University of California Press.
- Martin, J. W., and B. A. Carlson. (1998). Sage Sparrow (*Artemisiospiza belli*), No 326. In A. Poole (Ed.), *The Birds of North America Online*. Ithaca, NY: Cornell Laboratory of Ornithology, Retrieved in March, 2014 from: <http://bna.birds.cornell.edu/bna/species/326>.
- Moseley, R.K. (1994). Report on the Conservation Status of *Lepidium Papilliferum*. Boise, ID: Idaho Conservation Data Center and Idaho Department of Fish and Game.
- Pellant, M., P. Shaver, D. A. Pyke, and J. E. Herrick. (2005). Interpreting Indicators of Rangeland Health, Version 4. Technical Reference 1734-6.

- Pyke, D. A., Wirth, T. A., & Beyers, J. L. (2013). Does seeding after wildfires in rangelands reduce erosion or invasive species?. *Restoration Ecology*, 21(4), 415-421.
- Reynolds, T. D., and W. L. Wakkinen. (1987). Characteristics of the Burrows of Four Species of Rodents in Undisturbed Soils in Southeastern Idaho. *American Midland Naturalist* 118 (2): 245–250.
- Rickart, E. A. (1987). *Spermophilus townsendii*, No. 268. Washington, DC: American Society of Mammalogists.
- Rocky Mountain Cheatgrass Management Project. (2013). Cheatgrass Management Handbook: Managing an invasive annual grass in the Rocky Mountain region. Laramie, Wyoming: University of Wyoming, Laramie, Wyoming; Colorado State University, Fort Collins, Colorado.
- Rotenberry, J. T., M. A. Patten, and K. L. Preston. (1999). Brewer's Sparrow (*Spizella breweri*), No. 390. In A. Poole (Ed.), *The Birds of North America Online*. Ithaca, NY: Cornell Laboratory of Ornithology, Retrieved in March, 2014 from: <http://bna.birds.cornell.edu/bna/species/390>.
- Rowland, M. M., M. J. Wisdom, L. H. Suring, and C. W. Meinke. (2006). Greater Sage-grouse as an Umbrella Species for Sagebrush-associated Vertebrates. *Biological Conservation* 129: 323–335.
- Ryel, R. J., Caldwell, M. M., Leffler, A. J., & Yoder, C. K. (2003). Rapid soil moisture recharge to depth by roots in a stand of *Artemisia tridentata*. *Ecology*, 84(3), 757-764.
- Spence, L. E. 1937 Root Studies of Important Range Plants of the Boise River Watershed. *Journal of Forestry*
- Steenhof, K., E. Yensen, M. N. Kochert, and K. L. Gage. (2006). Populations and Habitat Relationships of Piute Ground Squirrels in Southwestern Idaho. *Western North American Naturalist* 66(4):482–491.
- Stiver, S. J., E. T. Rinkes, and D. E. Naugle. (2010). Sage-grouse Habitat Assessment Framework. Boise, ID: USDI, Bureau of Land Management, Idaho State Office.
- USDA, NRCS. 2006. The PLANTS Database (<http://plants.usda.gov>, 26 September 2006). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
- USDA and NRCS. (2012). Soil Survey Geographic (SSURGO) Database for Elmore, Owyhee, and Twin Falls Counties, Idaho. Boise, ID: USDA, Natural Resources Conservation Service, Soil Survey Staff, Retrieved in August, 2012 from: <http://soildatamart.nrcs.usda.gov>.
- USDA and NRCS. (2013a). Draft Ecological Site Description R025XY019ID, Loamy 10-13" Wyoming Big Sagebrush/Bluebunch wheatgrass ecological site. Boise, ID: State Office.
- USDA and NRCS. (2013b). Draft Ecological Site Description R011XY001ID, Loamy 8-12" Wyoming Big Sagebrush/Bluebunch wheatgrass-Thurber's needlegrass ecological site. Boise, ID: State Office
- USDA and NRCS. (2013c). The PLANTS Database. Retrieved December 14, 2013, from <http://plants.usda.gov>.
- U.S. Geological Survey. 2014. National Hydrography Data for the United States. <http://nhd.usgs.gov/index.html>.

- Van Horne, B., G. S. Olson, R. L. Schooley, J. G. Corn, and K. P. Burnham. (1997). Effects of Drought and Prolonged Winter on Townsend's Ground Squirrel Demography in Shrubsteppe Habitats. *Ecological Monographs* 67:295–315.
- Wambolt, C. L., and G. F. Payne. (1986). An 18-Year Compromise of Control Methods for Wyoming Big Sagebrush in Southwestern Montana. *Journal of Range Management*, 39(4), 314-319.
- Wisdom, M. J., R. S. Holthausen, B. C. Wales, C. D. Hargis, V. A. Saab, D. C. Lee, et al. (2000). Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin: Broad-Scale Trends and Management Implications, Volume 2: Group Level Results (General Technical Report No. PNW-GTR-485). Portland, OR: USDA, Forest Service, Pacific Northwest Research Station.
- Woods, C. P., and T. J. Cade. (1996). Nesting Habits of the Loggerhead Shrike in Sagebrush. *Condor* 98 (1):75–81.
- Yensen, E., D. L. Quinney, K. Johnson, K. Timmerman, and K. Steenhof. (1992). Fire, Vegetation Changes, and Population Fluctuations of Townsend's Ground Squirrels. *American Midland Naturalist* 128:299–312.
- Yensen, E., and P. W. Sherman. (2003). *Ground Dwelling Squirrels of the Pacific Northwest*. Boise, ID and Portland, OR: US Fish and Wildlife Service and USDI, Bureau of Land Management.
- Yosef, R. (1996). Loggerhead Shrike (*Lanius ludovicianus*), No. 231. In A. Poole (Ed.), *The Birds of North America Online*. Ithaca, NY: Cornell Laboratory of Ornithology, Retrieved in March, 2014 from: <http://bna.birds.cornell.edu/bna/species/231>.
- Young, J. A., E. Martens, and N. E. West. 1992. Germination of bur buttercup seeds. *Journal of Range Management* 45(4):358–362.

APPENDIX A: 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: shrub-lands, 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 shrub-lands to be evaluated they had to be at least 20 acres in size to accommodate sampling transects.

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

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

APPENDIX B: SPECIES LIST ACCUMULATED DURING UPLAND ASSESSMENTS

Scientific Name	Common Name	Species Type	Site(s) where species occurred
Perennial Grasses			
<i>Achnatherum hymenoides</i>	Indian ricegrass	Native	P3_1
<i>Achnatherum thurberianum</i>	Thurber's needlegrass	Native	P3_2, P3_3, P4_1, P4_2, P4_3, P4_4, P4_5, P5_2, P5_4, P5_5
<i>Agropyron cristatum</i>	Crested wheatgrass	Exotic, Seeded	P1, P3_1, P3_2, P4_1, P5_2, P5_4, P5_5
<i>Elymus elymoides</i>	Bottlebrush squirreltail	Native	P1, P3_1, P3_2, P3_3, P4_1, P4_2, P4_3, P4_4, P4_5, P5_1, P5_2, P5_4, P5_5
<i>Elymus lanceolatus</i>	Thickspike wheatgrass	Native	P5_4, P5_5
<i>Festuca idahoensis</i>	Idaho fescue	Native	P4_5
<i>Leymus cinereus</i>	basin wildrye	Native	P4_1, P5_1
<i>Pascopyrum smithii</i>	Western wheatgrass	Native	P3_1, P4_1, P5_1, P5_2, P5_3, P5_5
<i>Poa secunda</i>	Sandberg bluegrass	Native	P1, P3_1, P3_2, P3_3, P4_1, P4_2, P4_3, P4_4, P4_5, P5_1, P5_2, P5_3, P5_4, P5_5
<i>Elymus wawawaiensis</i>	Snake River wheatgrass	Native, Seeded	P4_2, P5_1, P5_3, P5_4
Annual Grasses			
<i>Bromus tectorum</i>	Cheatgrass	Exotic, Invasive	P1, P3_1, P3_2, P3_3, P4_1, P4_2, P4_3, P4_5, P5_1, P5_3, P5_4, P5_5
<i>Vulpia octoflora</i>	Sixweeks fescue	Native	P3_3, P5_2
Perennial Forbs			
<i>Allium</i> spp.	Onion	Native	P3_3, P4_2, P4_4, P5_1, P5_2, P5_3
<i>Allium acuminatum</i>	Tapertip onion	Native	P4_1, P5_5
<i>Allium nevadense</i>	Nevada onion	Native	P1, P3_2, P4_1, P5_4, P5_5
<i>Antennaria dimorpha</i>	Low pussytoes	Native, Sage-grouse Preferred	P1, P3_1, P4_1, P4_3, P5_2, P5_4
<i>Arabis</i> spp.	Rockcress	Native	P4_1
<i>Astragalus</i> spp.	Milkvetch	Native	P3_2, P3_3, P5_5
<i>Astragalus atratus</i>	Mourning milkvetch	Native	P4_1, P5_1, P5_2, P5_4, P5_5
<i>Astragalus lentiginosus</i>	Freckled milkvetch	Native	P1, P3_2, P4_1, P4_4, P4_5, P5_1, P5_2, P5_4, P5_5
<i>Astragalus purshii</i>	Woollypod milkvetch	Native	P1, P3_2, P4_1, P4_4, P4_5, P5_2, P5_4
<i>Castilleja angustifolia</i>	Northwestern Indian paintbrush	Native	P4_1, P5_4, P5_5
<i>Crepis acuminata</i>	Tapertip hawksbeard	Native, Sage-grouse Preferred	P4_1, P4_2, P5_1, P5_2, P5_4, P5_5
<i>Cryptantha humilis</i>	Roundspike cryptantha	Native	P5_2
<i>Delphinium andersonii</i>	Anderson's larkspur	Native	P3_1, P4_1, P5_4, P5_5
<i>Erigeron</i> spp.	Fleabane	Native, Sage-grouse Preferred	P1, P3_1, P3_3, P4_1, P4_3, P5_5
<i>Erigeron pumilus</i>	Shaggy fleabane	Native, Sage-grouse Preferred	P1, P3_2, P3_3, P4_1, P5_1, P5_2, P5_4, P5_5
<i>Eriogonum</i> spp.	Buckwheat	Native	P5_5
<i>Linanthus pungens</i>	Granite prickly phlox	Native	P3_1, P5_4
<i>Linum lewisii</i>	Lewis flax	Native	P3_2, P5_1
<i>Lomatium cous</i>	Cous biscuitroot	Native, Sage-	P5_1

Scientific Name	Common Name	Species Type	Site(s) where species occurred
		grouse Preferred	
<i>Lomatium foeniculaceum</i>	Desert biscuitroot	Native, Sage-grouse Preferred	P4_1, P5_2, P5_5
<i>Machaeranthera canescens</i>	Hoary tansyaster	Native	P3_2
<i>Medicago sativa</i>	Alfalfa	Exotic, Sage-grouse Preferred	P4_5
<i>Microsteris gracilis</i>	Slender Phlox	Native	P5_2
<i>Penstemon</i> spp.	Penstemon	Native	P5_2
<i>Phlox aculeata</i>	Sagebrush phlox	Native, Sage-grouse Preferred	P1, P3_1, P3_2, P4_1, P4_2, P4_3, P4_4, P4_5, P5_1, P5_2, P5_4, P5_5
<i>Phlox hoodii</i>	Spiny phlox	Native, Sage-grouse Preferred	P1, P3_1, P3_3, P4_1, P4_4, P5_1, P5_2, P5_4
<i>Phlox longifolia</i>	Longleaf phlox	Native, Sage-grouse Preferred	P3_2, P3_3, P4_1, P4_2, P4_4, P4_5, P5_1, P5_2, P5_3, P5_5
<i>Ranunculus glaberrimus</i>	Sagebrush buttercup	Native	P4_1
<i>Taraxacum officinale</i>	Common dandelion	Exotic, Sage-grouse Preferred	P3_1, P3_2
<i>Tragopogon dubius</i>	Yellow salsify	Exotic, Sage-grouse Preferred	P1, P3_2, P4_3, P4_4
<i>Zigadenus venenosus</i>	Meadow deathcamas	Native	P1, P4_1, P5_2, P5_4, P5_5
Annual Forbs			
<i>Agoseris glauca</i>	Pale agoseris	Native, Sage-grouse Preferred	P3_3, P4_1, P4_4, P5_1, P5_4
<i>Alyssum desertorum</i>	Desert madwort	Exotic	P5_5
<i>Cerastium nutans</i>	Nodding chickweed	Native	P5_1, P5_3
<i>Ceratocephala testiculata</i>	Curvseed butterwort	Exotic	P1, P3_1, P4_1, P4_3, P4_4, P5_1, P5_2, P5_4, P5_5
<i>Collinsia parviflora</i>	Maiden blue eyed Mary	Native	P4_1
<i>Descurainia incana</i>	Mountain tansymustard	Native	P1, P4_5, P5_1, P5_3
<i>Descurainia pinnata</i>	Western tansymustard	Native	P1, P3_1, P3_2, P3_3, P4_1
<i>Draba verna</i>	Spring draba	Exotic	P1, P3_3, P4_1
<i>Epilobium brachycarpum</i>	Tall annual willowherb	Native, Sage-grouse Preferred	P3_3
<i>Gayophytum</i> spp.	Groundsmoke	Native	P5_4
<i>Lepidium perfoliatum</i>	Clasping pepperweed	Exotic	P1, P3_1, P4_1, P4_3, P5_4, P5_5
<i>Microsteris gracilis</i>	Slender phlox	Native, Sage-grouse Preferred	P4_1, P5_2
<i>Salsola kali</i>	Russian thistle	Exotic	P1, P3_2
<i>Sisymbrium altissimum</i>	Tall tumbled mustard	Exotic	P1, P3_1, P3_2, P3_3, P4_1, P4_2, P4_3, P4_5, P5_4, P5_5
Noxious Weed			
<i>Chondrilla juncea</i>	Rush skeletonweed	Exotic, Invasive	P5_4, P5_5
Shrubs			
<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>	Wyoming big sagebrush	Native	P1, P3_1, P3_3, P4_1, P4_2, P4_3, P4_4, P4_5, P5_1, P5_2, P5_4, P5_5
<i>Chrysothamnus viscidiflorus</i>	Yellow rabbitbrush	Native	P1, P3_2, P4_1, P4_4, P4_5
<i>Ericameria nauseosa</i>	Rubber rabbitbrush	Native	P1, P3_1, P3_2, P3_3, P5_5

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