

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

**Curlew
Assessment and Evaluation
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I. INTRODUCTION

This document assesses and evaluates the land health condition of public lands administered by the Bureau of Land Management (BLM), Pocatello Field Office (PFO). A landscape-level approach was used to collect information necessary to assess the land health condition, understand ecological processes, and current uses. This document evaluates the existing uses, current management actions, and current conditions of the public lands' resources (e. g. soils, vegetation, riparian-wetlands, water quality, and wildlife). It also includes an evaluation of the Idaho Standards for Rangeland Health (USDI 1997).

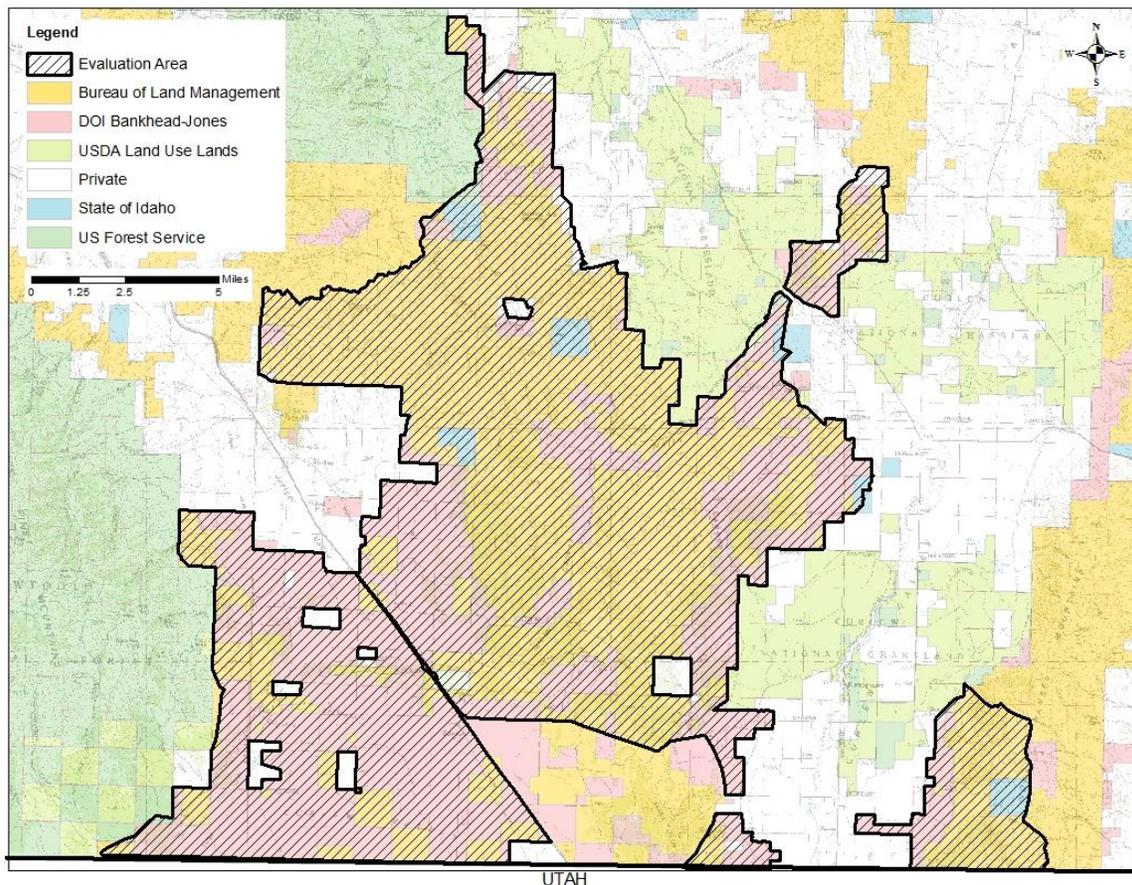
Overview / Location Overview

The evaluation area encompasses approximately 139,999 acres consisting of approximately 134,241 acres of public land, which were assessed or considered within the evaluation, with an additional 2,691 acres of State land; 819 acres of US Forest Service land and 2,236 acres of private land.

The area lies approximately 20 miles west of Malad City, Idaho and 10 miles northwest of Snowville, Utah. The evaluation area is primarily located in southwestern Oneida County, Idaho. It is bounded by the Utah-Idaho State line on the south, the bottom slopes of Black Pine Mountain in Cassia, County to the west, the Power County line to the north, and the Curlew Valley/Hansel Mountains to the east.

Topography within the evaluation area varies from flat in the southern portion, southwest of Interstate 84 (4,500 ft. elevation), to steep and mountainous to the north (7,100 ft. elevation) and east (6,900 ft. elevation). Precipitation varies between 8 and 22 inches annually and generally falls in the form of snow and spring showers (Appendix B, precipitation data).

Figure 1.1: Evaluation Area.



II. ASSESSMENT OF EXISTING USES AND MANAGEMENT

A. Lands and Realty

In the late 1800's and early 1900's farmable lands located within the evaluation area were divided into 160 acre homesteads. The towns of Black Pine and Juniper were established around this time.

In 1937, the Bankhead-Jones Farm Tenant Act (P.L. 75-210) authorized the federal government to acquire private lands sub marginal for cultivation and to rehabilitate them for various purposes; i.e. controlling soil erosion, reforestation, preserving natural resources, mitigating floods, preventing impairment of dams and reservoirs, conserving surface and subsurface moisture, protecting the watersheds of navigable streams, and protecting the public lands, health, safety, and welfare.

Implementation of the Bankhead-Jones Act was a landscape-level effort across southern Idaho, which acquired approximately 36,267 acres (27 %) of the public lands within the evaluation area (See Figure 1). The Curlew National Grasslands, which are adjacent to the evaluation area and administered by the USDA Forest Service, were also acquired at this same time. These acquired lands have a precipitation range that is generally between 8 to 12 inches annually.

Lands that were acquired by the government through the Bankhead-Jones Act were predominately planted with crested wheatgrass. These seedings are covered more thoroughly under Section III, Existing Resources, Subsection B, Vegetation. Further, many right-of-ways (ROW) were issued upon, over and under these lands. Rights-of-way for roads (i. e. federal, state, county, and private), pipelines (i. e. natural gas and oil), power lines, and communication site leases have been authorized by the BLM in the evaluation area.

B. Recreation/Travel Management

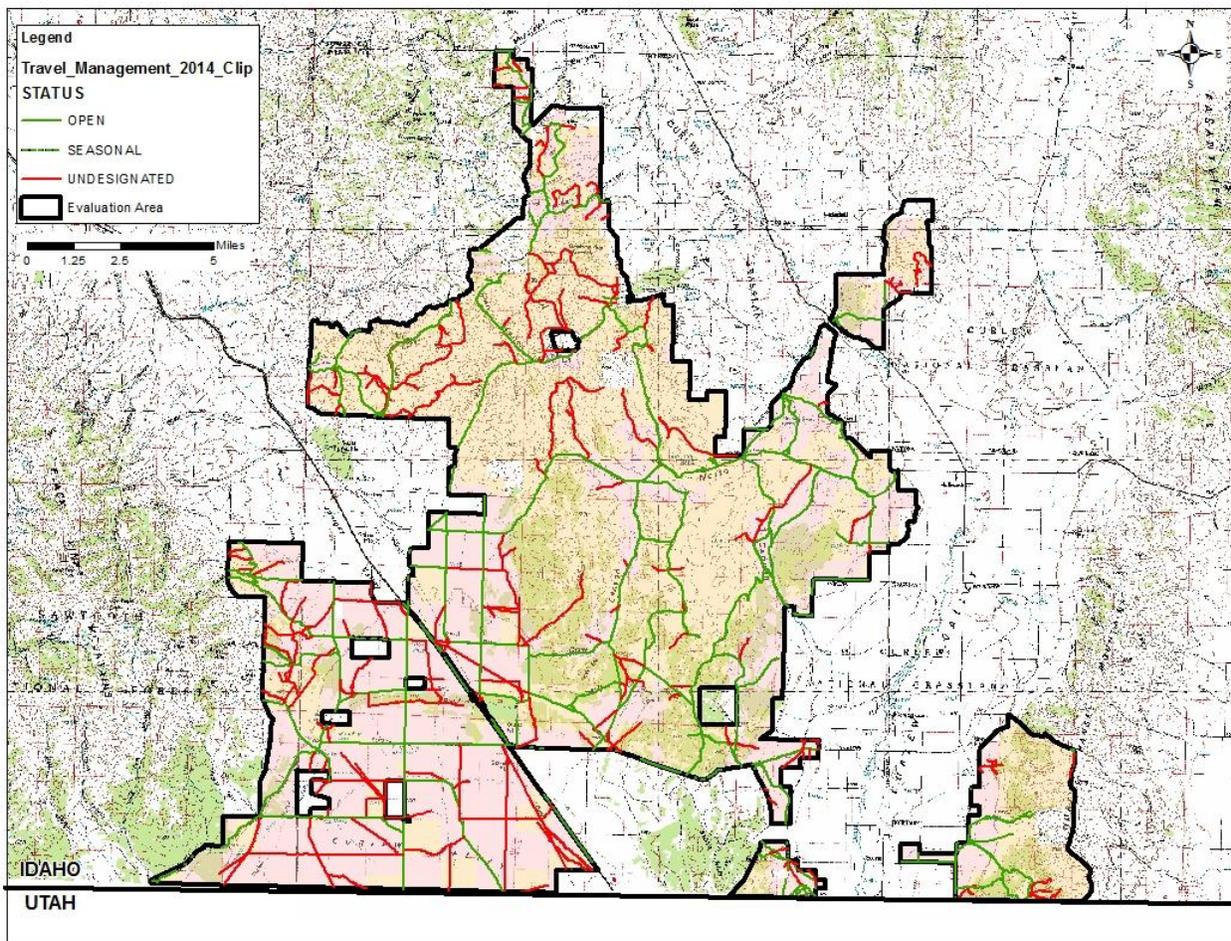
i. Recreation

Public lands administered by the PFO within the evaluation area provide for dispersed recreation opportunities. Typically, the type of dispersed recreation opportunities include, but are not limited to, hunting, camping, hiking, horseback riding, wildlife viewing, photography, and motorized travel on existing roads and trails.

ii. Travel Management

Prior to approval of the Pocatello Resource Management Plan (RMP) (2012), there were no motorized travel restrictions within the evaluation area. The approved RMP limited motorized travel to existing roads and trails in areas that did not have existing travel management plans (TMP). In January 2014, the Curlew Deep Creek Travel Management Plan was signed and approved which limited motorized travel to designated routes within the TMP unless travel variances for administrative purposes are authorized. The TMP includes the evaluation area in which approximately 222 miles were designated as open to motorized use and approximately 183 miles were not designated for motorized travel.

Figure 2.1: Motorized vehicle travel route designations within the evaluation area.



C. Fire History & Management

Over the past 70 plus years (1939-2013) at least 53 wildfires are known to have burned approximately 120,908 acres of public lands within the evaluation area (Table 2.1). Between 2000 and 2013, approximately 73,008 acres burned within the evaluation area; however, due to multiple fires occurring within the same area, the burn footprint for this period equals 67,322 acres. The majority of those acres (62,219 acres) burned during 2006-2007. These fires were difficult to contain due to the dense, continuous juniper canopy cover.

Table 2.1: Fire occurrence (year and size) between 1939 and 2013 within the evaluation area.

| Year | Acres Burned | Year | Acres Burned |
|-------|--------------|------|--------------|
| 2013* | 0 | 1987 | 71 |
| 2012* | 80 | 1986 | 2,544 |
| 2011* | 231 | 1985 | 165 |
| 2007* | 21,232 | 1983 | 10,034 |
| 2006* | 40,987 | 1982 | 124 |
| 2005* | 3,098 | 1981 | 176 |
| 2003* | 205 | 1979 | 935 |
| 2001* | 5,243 | 1978 | 73 |
| 2000* | 1,932 | 1965 | 825 |
| 1995 | 516 | 1963 | 590 |
| 1992 | 25,065 | 1962 | 263 |
| 1991 | 78 | 1961 | 2,445 |
| 1989 | 1,200 | 1939 | 1,453 |
| 1988 | 1,343 | | |

* Evaluation period

The wildfire perimeters are presented in Figure 2.2 and Figure 2.3. Over-lapping fire perimeters indicate areas that are more prone to fire activity than others. Since 1939, for example, at least 10 wildfires have occurred in the Cow Hollow area, which is located approximately in the center of the evaluation area, while the area southwest of Interstate 84 and north of the Utah border saw little to no fire activity during the same period.

Following wildfire, burned areas were typically closed to grazing for one or more growing seasons to allow the vegetation to recover. Portions of the burned area were seeded with grasses, forbs and/or shrubs to enhance recovery and re-establish plant communities.

Recovery of the vegetation following wildfire differs among plant species and growth forms. Perennial forbs and grasses usually resprout and grow relatively quickly following a wildfire and can recover within a relatively short time period (< 5 years) unless their growing points (meristems) have been completely destroyed. Sprouting shrubs, e.g. rabbitbrush, also recover relatively quickly (5-10 years) following wildfire. Non-sprouting shrubs like most sagebrush species take longer, at least 10 to 15 years to begin recovery and much longer (e.g. 70 to +200 years) to fully recover to pre-burn conditions.

Figure 2.2: Perimeters of wildfires that have occurred in the vicinity of the Evaluation Area between 1939 and 2012.

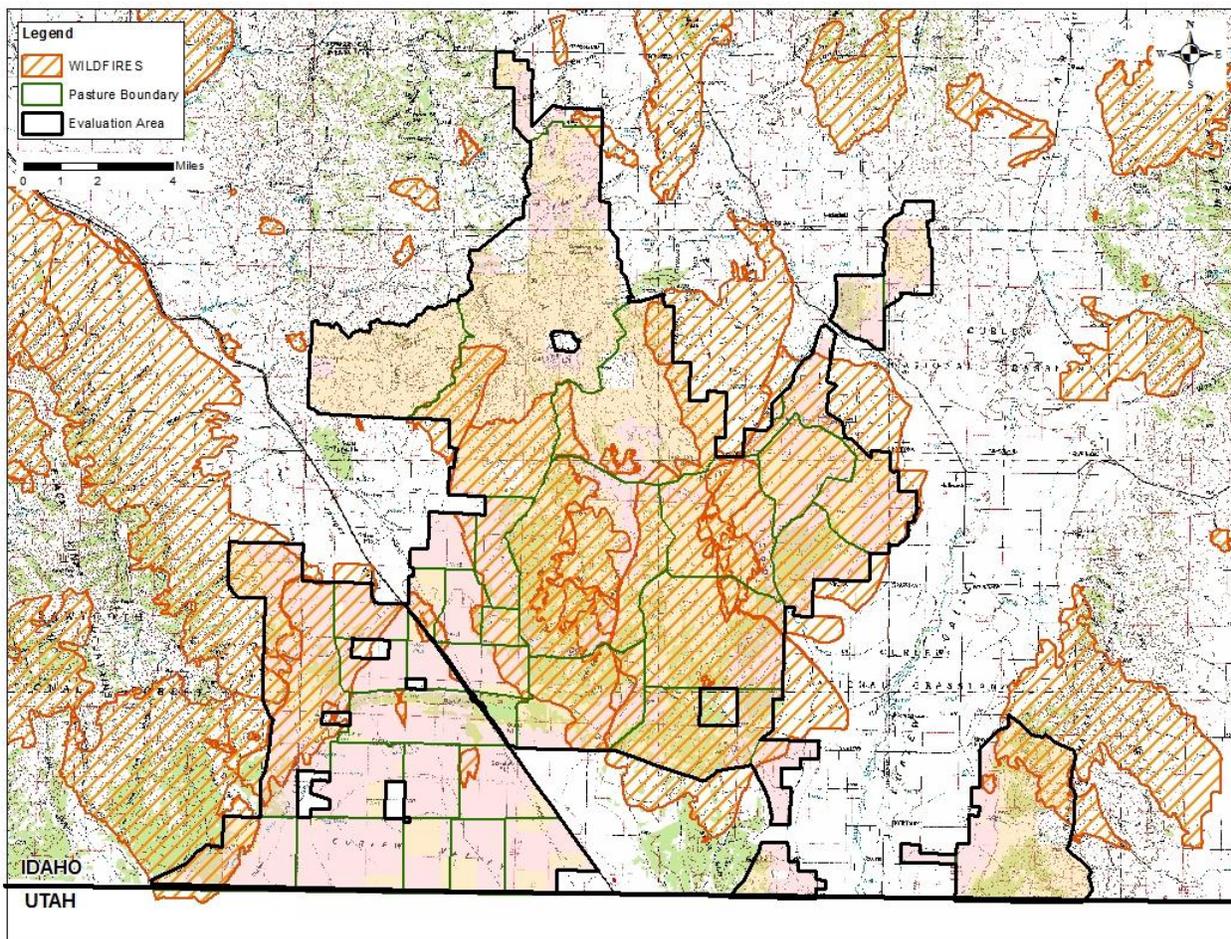
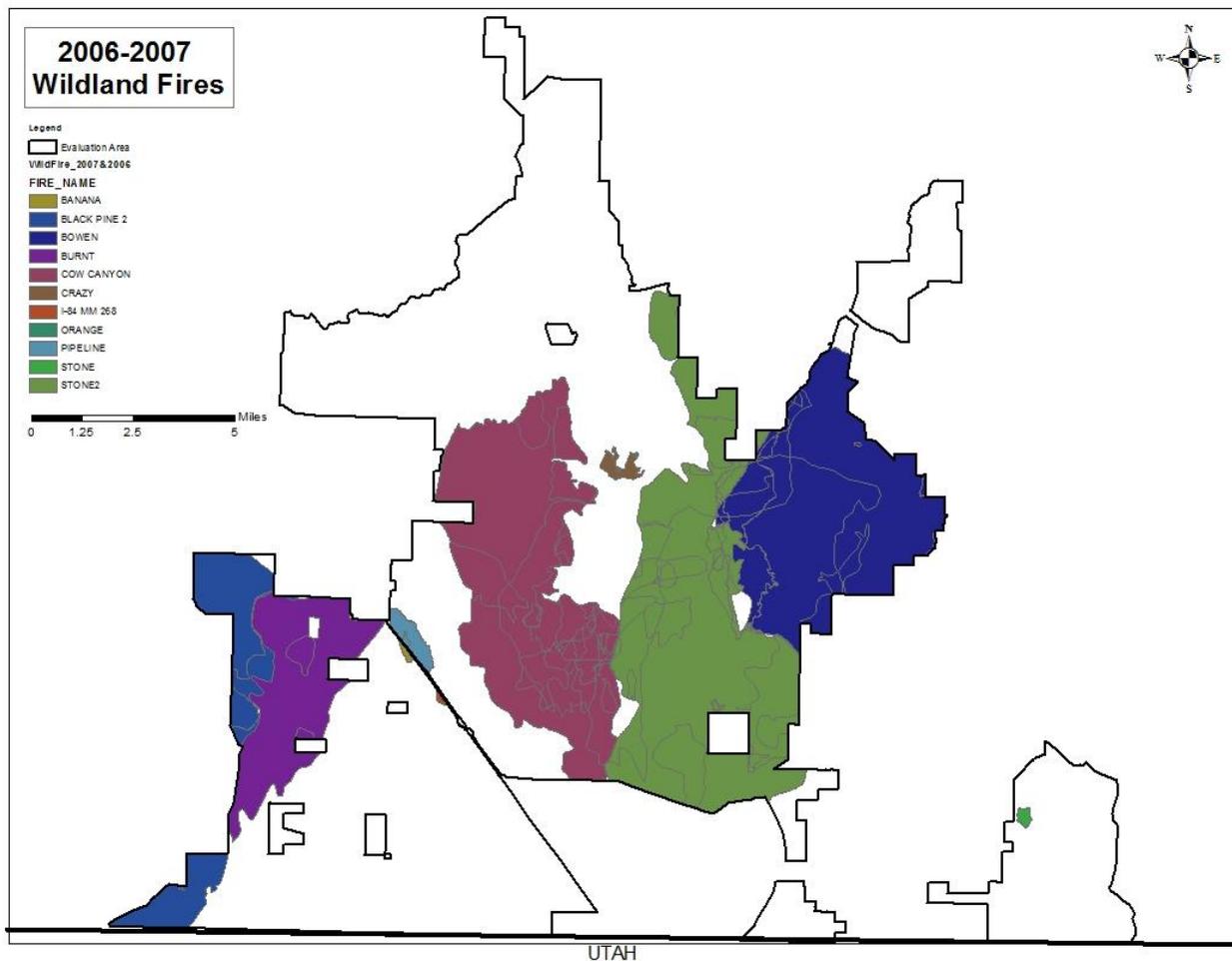


Figure 2.3: Perimeters of wildfires that have occurred within the Evaluation Area between 2006 and 2007.



i. Post Fire Recovery Treatments

Following the fires of 2006 and 2007 which burned a footprint of 62,219 acres, a variety of rehabilitation treatments were conducted with varying levels of success. Sagebrush seedlings were planted on 50 acres, sagebrush and grass seed was aurally applied to approximately 20,279 acres, and approximately 2,100 acres were drill seeded, approximately 50 acres were chained and approximately 1,038 acres were ground seeded. Seeded species included bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*), Great Basin wildrye (*Leymus cinereus*), Sandberg bluegrass (*Poa secunda*), white yarrow (*Achillea millefolium*), lewis flax (*Linum lewisii*), Wasatch penstemon (*Penstemon cyananthus*), Basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*), and mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). These treatments were monitored following treatment implementation. Due to the large number of treatments implemented and limited staff, a limited number of plots were established within each treatment.

Table 2.2: Type and application method used and acres seeded/seedlings planted following the 2006/2007 wildland fires within the evaluation area.

| FIRE YEAR | FIRE NAME | Seed/Seedling Application Method | | | | |
|-----------|-------------|----------------------------------|--------------------------|----------------------|---------------|--------------------------------|
| | | Drill Seeded | Drill Seeded/ Chained | Spreader/ OHV/UTV | Aerial Seeded | Seedlings Planted Mechanically |
| 2006 | Burnt | 2,100 | [50] | 550 | 7,387 | -- |
| | Stone 2 | -- | -- | -- | 6,600 | -- |
| | Bowen | -- | -- | -- | 2,000 | -- |
| 2007 | Black Pine* | -- | -- | -- | -- | -- |
| | Cow Hollow | -- | -- | 9,000 | -- | 50 |
| Total | | 2,100 | [50] | 9,550 | 16,987 | 50 |

Brackets [] indicate the acres shown are a subset of the drill seeded acres.

*No treatments conducted following the fire in 2007.

The Burnt Fire (CU2D) occurred in 2006 on the west side of the evaluation area within the Van Koman, North Mills, and South Mills pastures of the Curlew Allotment. Following this fire, approximately 2,100 acres were drill seeded, 50 acres of that drill seeding was chained and another 550 acres were seeded using spreaders and OHVs. Approximately 7,387 acres were aerially seeded using a mixture of native forbs and Mountain Big Sagebrush. The success of all of these treatments was mixed. The drill seeded areas did show greater coverage of native grass species compared to undesirable plant species and cheat grass. However, it is impossible to tell if this was a result of the treatment or natural regeneration following the fire. It does not appear that the aerial seeding was a success. After 3 years only one sagebrush seedling was encountered during sampling and the presence of the seeded forb species was minimal.

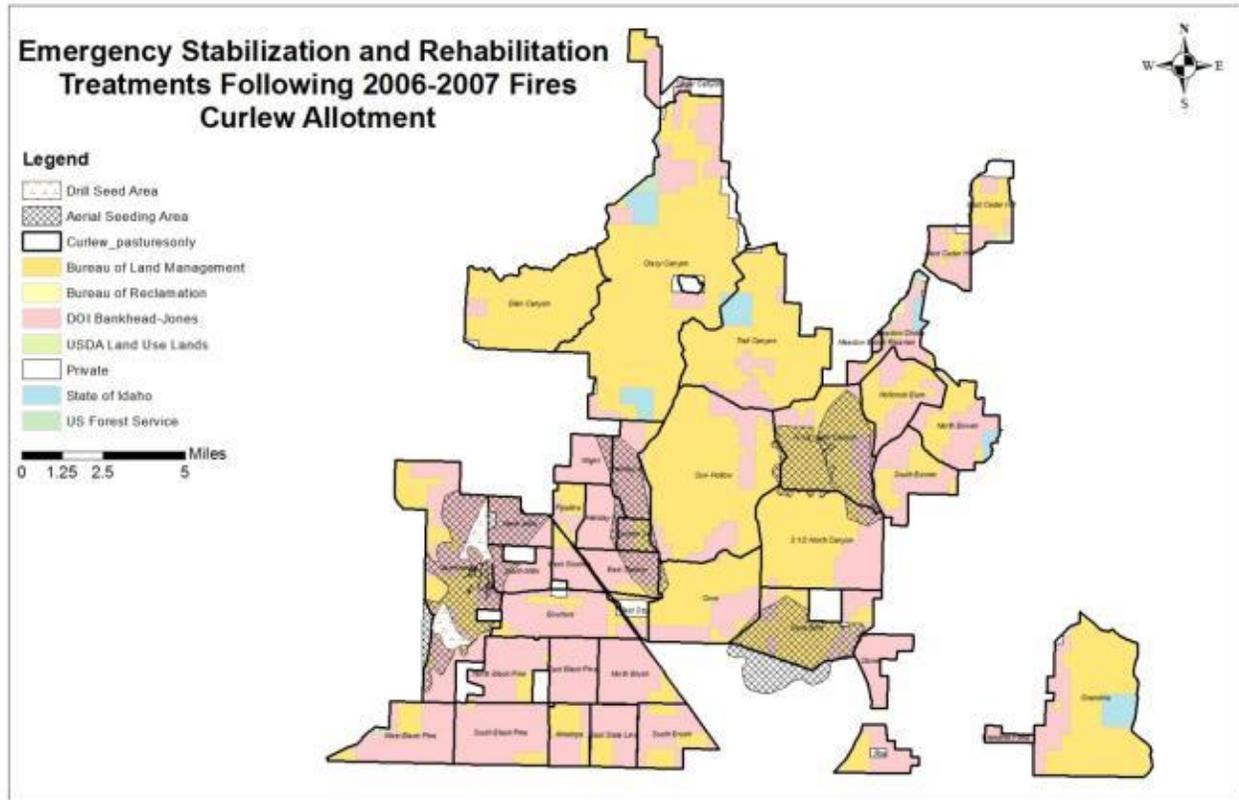
The Stone 2 Fire (C2S3) occurred in 2006 on the north east side of the evaluation area within the Trail Canyon, Cow Hollow, Cove, North Canyon, Cove Burn, and Stone pastures of the Curlew Allotment. Following the fire approximately 6,600 acres were aerially seeded; 4,600 acres of Basin Big Sagebrush and 2,000 acres of Mountain Big Sagebrush. The treatments were conducted due to the extensive juniper canopy cover prior to the fire which is believed to cause a decrease in native vegetation and an increase in invasive species. Monitoring data three years post treatment indicates that neither of these treatments met objectives.

The Bowen Fire (C32S) occurred in 2006 on the north east side of the evaluation area within the Meadow Brook Divide, North Canyon, Holbrook Burn, North Bowen, and South Bowen pastures of the Curlew Allotment. Following the fire approximately 2,000 acres were aerially seeded with mountain big sagebrush. The treatments were conducted due to the extensive juniper canopy cover prior to the fire which is believed to cause a decrease in native vegetation and an increase in invasive species. As with the Stone 2 Fire treatments, monitoring data three years post treatment indicates that this treatment failed to meet objectives.

The Black Pine Fire (DNN9) occurred in 2007 on the North west side of the evaluation area within the Van Koman and West Black Pine pastures of the Curlew Allotment. Following the fire no vegetation treatments were conducted.

The Cow Hollow Fire (DJ1Y) occurred in 2007 within the middle portion of the evaluation area within the Cow Hollow, Trail Canyon, Crazy Canyon, Holiday-1, Holiday-2, Wight, Section 24, East Stocker, and Cove pastures of the Curlew Allotment. Following the fire approximately 9,000 acres of Mountain Big Sagebrush was seeded using a tracked UTV on snow. Monitoring following the treatment determined that the treatment was unsuccessful. An additional 50 acres of bare root sagebrush seedlings were planted using a tractor. This treatment was highly successful with a survival rate of 61% after one year and continued high survival rate to date. The treatments were conducted due to the extensive juniper canopy cover prior to the fire which is believed to cause a decrease in native vegetation and an increase in invasive species.

Figure 2.4: Emergency Stabilization and Rehabilitation Treatments Following the 2006-2007 Fires within the Evaluation Area.



D. Noxious and Invasive Weeds and Management

Seeds of undesirable species may be dispersed by wind, water, animals, or humans. The highest concentrations of noxious weeds within the evaluation area occur along roads, trails and disturbed areas commonly associated with gravel pits, livestock watering sites, etc. I-84, nearly bisects the evaluation area, posing an elevated risk of noxious/invasive species dispersion. In addition, agricultural fields within and adjacent to the evaluation area increase the presence and possible dispersion of weedy species.

Noxious and invasive species known to occur within the evaluation area are listed below (Table 2.3). Some species such as prickly lettuce and salsify are palatable to wildlife and livestock. A weed inventory was conducted in 2006. A summary of the noxious weeds that have been inventoried and treated in conjunction with that inventory is presented in Figure 2.5 below. Though noxious and invasive weeds are present within the evaluation area, there are no infestations that would constitute an exotic plant community as defined by Standard 6.

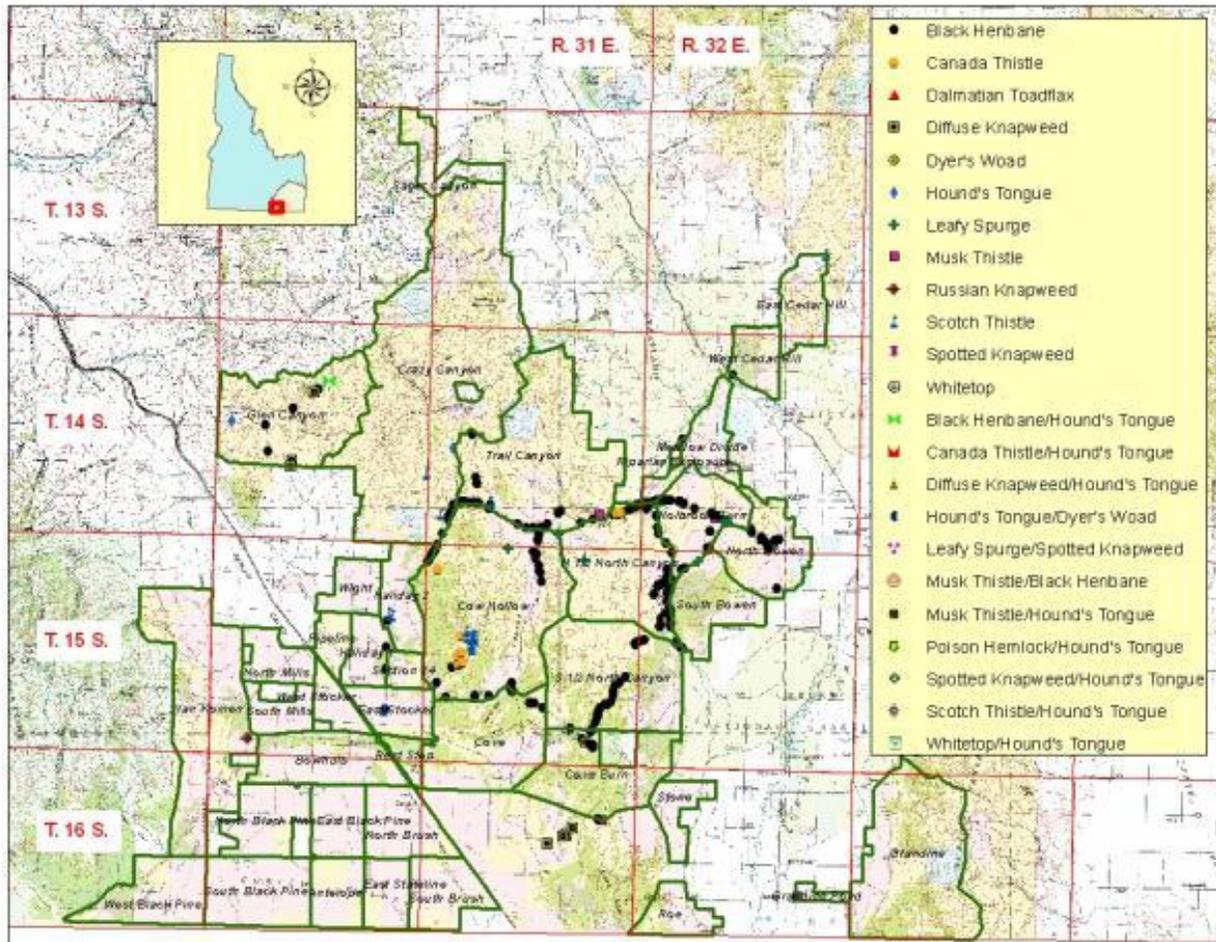
Table 2.3 - Noxious and invasive weeds known to occur within the Evaluation Area.

| Noxious * | Invasive |
|---|---|
| Black henbane (<i>Hyoscyamus niger</i>)* | Bull thistle (<i>Cirsium vulgare</i>) |
| Canada thistle (<i>Cirsium arvense</i>)* | Curly-cup gumweed (<i>Grindelia squarrosa</i>) |
| Diffuse knapweed (<i>Centaurea diffusa</i>)* | Knotweed (<i>Polygonum</i> spp.) |
| Dyer's woad (<i>Isatis tinctoria</i>)* | Pepperweed (<i>Lepidium perfoliatum</i>) |
| Field bindweed (<i>Convolvulus</i> spp.)* | Poverty-weed (<i>Monolepis</i> spp.) |
| Hound's tongue (<i>Cynoglossum officinale</i>)* | Prickly lettuce (<i>Lactuca serriola</i>) |
| Leafy spurge (<i>Euphorbia esula</i>)* | Salsify (<i>Tragopogon dubius</i>) |
| Musk thistle (<i>Carduus nutans</i>)* | Shepherd's purse (<i>Capsella Bursa-pastoris</i>) |

| Noxious * | Invasive |
|--|---|
| Puncture vine (<i>Tribulus terrestris</i>)* | Sunflower (<i>Helianthus annuus</i>) |
| Russian knapweed (<i>Acroptilon repens</i>)* | Tumble mustard (<i>Sisymbrium altissimum</i>) |
| Scotch thistle (<i>Onopordum acanthium</i>)* | Whitetop (<i>Cardaria draba</i>) |
| Spotted knapweed (<i>Centaurea stoebe</i>)* | Halogeton (<i>Halogeton glomeratus</i>) |
| | Cheatgrass (<i>Bromus tectorum</i>) |

* Noxious weeds that are listed by the State of Idaho (Prather et al. 2010)

Figure 2.5: Inventory of noxious weeds that have been inventoried and treated since 2006.



Other populations of noxious and invasive plant species are known to occur other than what are depicted in the above figure. For example, the exotic invasive halogeton occurs within the southwest corner of the evaluation area while the annual cheatgrass (*Bromus tectorum*) occurs throughout; in rangeland seedings and native communities; with the heaviest infestations of the invasive grass occurring within the same areas containing halogeton.

The PFO's noxious weed control program is a collaborative effort between the BLM and the Oneida County Weed Control Program. Through this collaborative annual effort, noxious weeds are monitored and controlled within the evaluation area and other public lands throughout Oneida County emphasizing the roadsides and infestation break-out areas when they are identified. Herbicide and biological releases are two control methods currently in use. These control efforts have been successful in limiting the spread of noxious weeds; however, it is not expected to completely eradicate noxious weeds. Annual weed inventories and treatments are expected to continue.

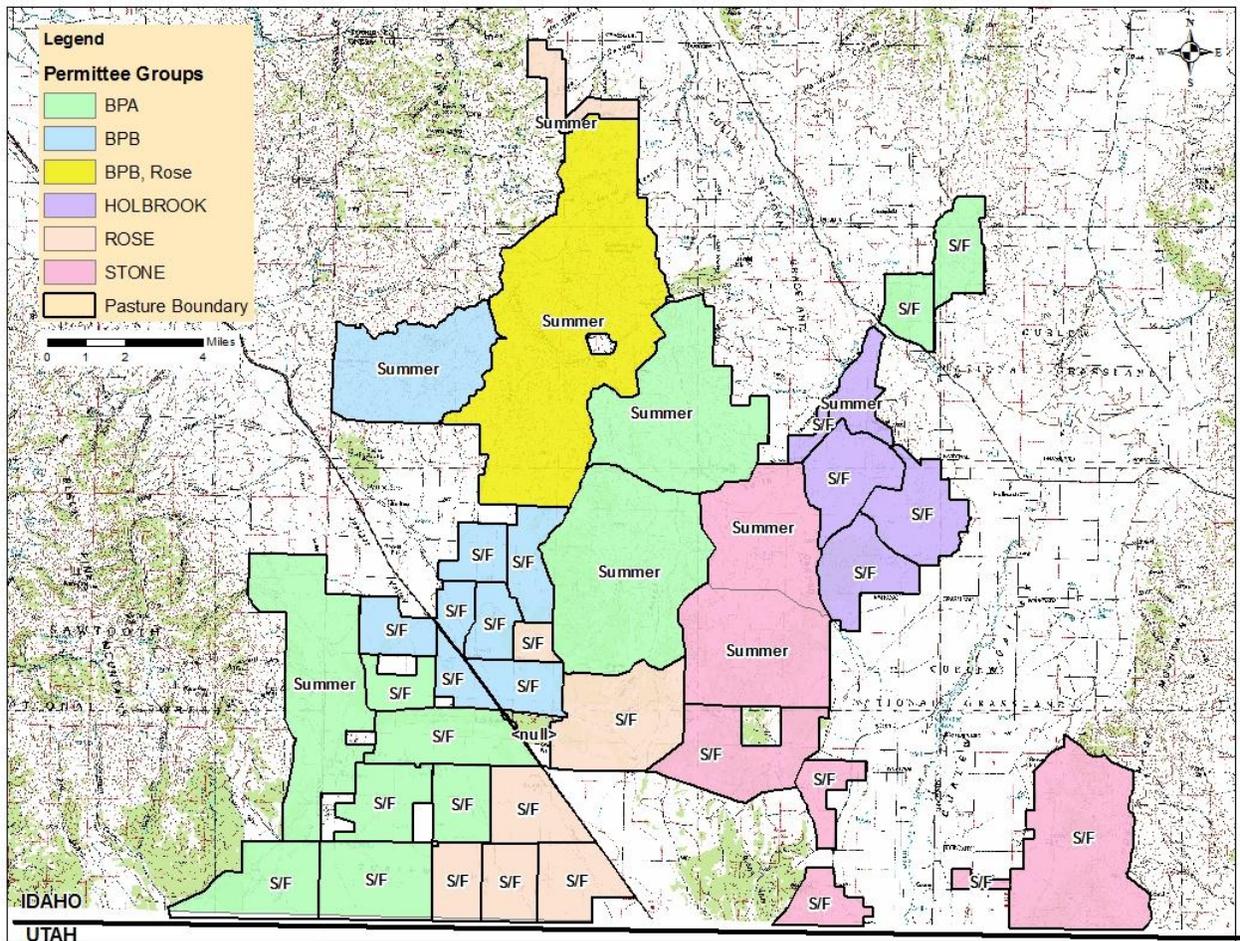
E. Grazing Management

The Curlew grazing allotment encompasses the entire evaluation area and is divided into 39 pastures. There are currently 22 grazing permits authorizing a total of 24,928 active Animal Unit Months (AUMs) and zero suspended. The number and kind of livestock authorized consists of approximately 4,200 cattle/cow-calf pairs, 1,200 sheep, and 18 horses; however these numbers fluctuate throughout the season of use.

The current authorization of livestock numbers and management was outlined in the Final Decision issued July 3 1997. In 1999, an environmental assessment was completed analyzing grazing as outline in the 1997 Final Decision. Final Decision dated August 2, 1999 reissued grazing permits under the same management system as described in the 1997 decision and made that decision part of the terms and conditions of each grazing permit. As a result of these decisions, the 22 grazing permit holders (permittees) were separated into five groups and each group was assigned specific pastures in which they were authorized to graze livestock. The five management groups consist of, Black Pine-A (BPA), Black Pine-B (BPB), Black Pine-C (BPC), Holbrook, and Stone.

Livestock management varies for each group, however generally pastures are designated for summer or spring and fall use. Pastures that can be used in the spring and fall are managed under a rest rotation system (i.e. Year 1 – Spring, Year 2 – Fall, Year 3 – Rest), whereas summer pastures are used every year. In order to run a rest rotation system each group was assigned more than 3 spring/fall designated pastures. Figure 2.6 shows the pastures assigned to each group and the management designation (use period).

Figure 2.6: Permittee groups and seasons of use (S/F = Spring/Fall use)



The 1997 grazing decision further grouped specific spring/fall pastures that would be run together under the rest rotation system. Table I-1 in Appendix I shows the season of use by permittee and pasture groupings.

The quality and acres of public land that was assigned to each group varies. Crested wheatgrass seedings dominate the lower valleys and make up the majority of the spring/fall pastures. The seedings vary in their forage production. Seedings that have recently been affected by wildfires generally have more vigorous plants and higher production than seedings that have been invaded by juniper or where sagebrush has re-established. Summer pastures are generally dominated by native vegetation.

The 1997 grazing decision allocated livestock at specific stocking rates for each pasture, however it could not be determined how the stocking rates were derived. Through the 2013 assessment process stocking rates within each pasture were reviewed in combination with actual use (Appendix H), utilization data (Use Pattern Maps Appendix D), ecological site potential, and estimated forage production within a pasture. The result of this review raised concerns with the current stocking rates associated with spring/fall pastures in the southwest portion of the allotment. In 2014, production data was collected within pastures where current stocking rates were a concern (Appendix G).

The following section focuses on current livestock management by permittee group. Each group runs different from the others and has different management capabilities within their assigned pastures (e.g. Water availability, forage production, etc.).

Grazing Management: Black Pine A (BPA)

The BPA group is comprised of six permittees authorized to graze approximately 1,848 cattle and 2 horses. Based on actual use reports, horses have not been run since they were authorized in 1997. The livestock number, kind, season of use and AUMs authorized in each permittees grazing permit is outline in Table 2.4.

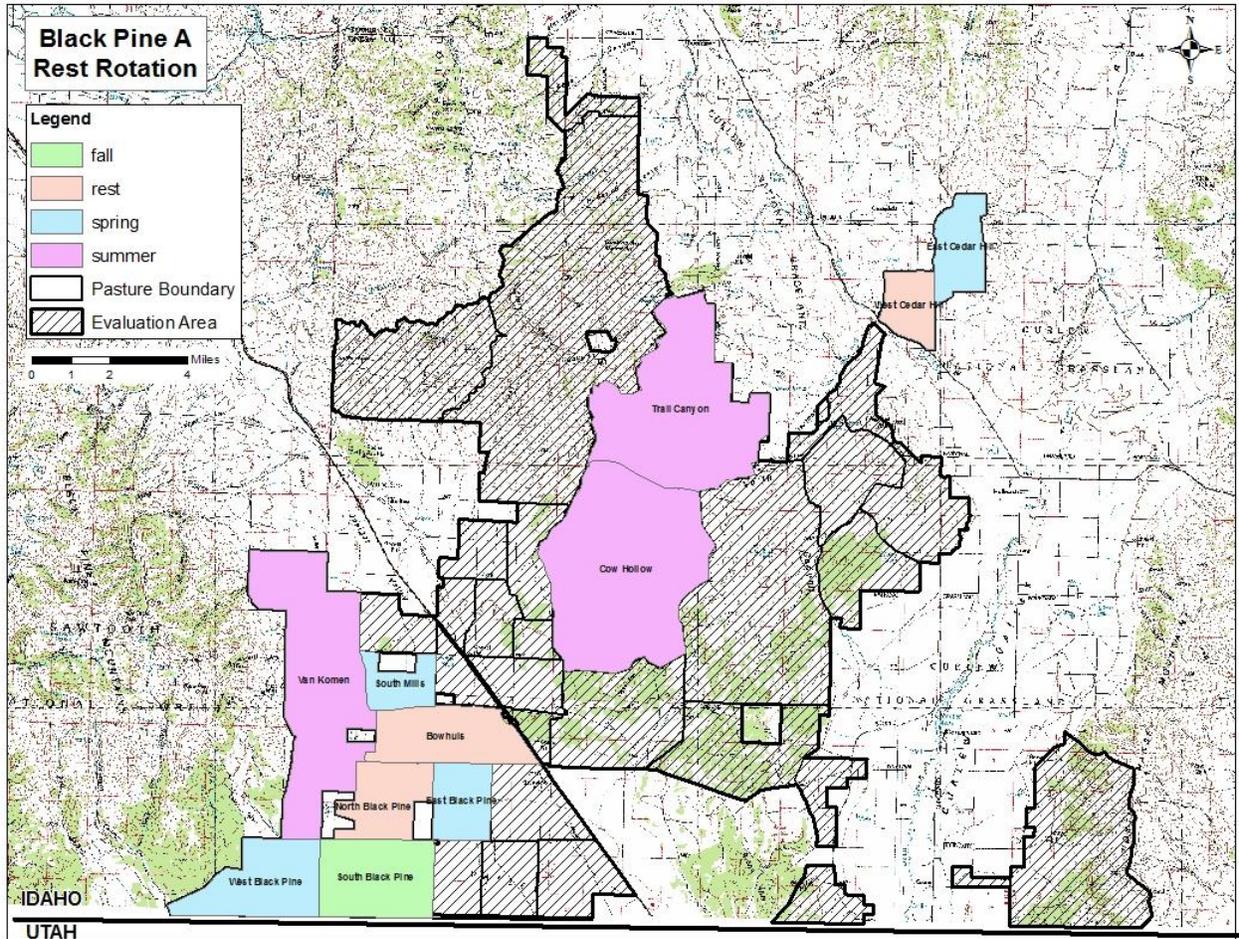
Table 2.4: Authorized use by permittee in Black Pine A group.

| Permittee | Livestock Number & Kind | Season-of-Use | Active AUMs |
|--------------------|-------------------------|---------------|---------------------|
| Boyer, Russell K. | 74 C | 4/16–10/31 | 484 |
| | 95 C | 5/1–10/31 | 575 |
| Eliason, Dave | 50 C | 4/16–5/1 | 26 |
| | 452 C | 5/2–6/19 | 728 |
| | 231 C | 6/20–9/15 | 668 |
| | 445 C | 9/16–10/27 | 614 |
| Eliason, Don / Ken | 158 C | 4/25–6/19 | 291 |
| | 179 C | 5/1–6/19 | 294 |
| | 407 C | 6/20–9/15 | 1178 |
| | 407 C | 9/16–10/31 | 616 |
| | 63 C | 7/1–9/20 | 170 |
| | 70 C | 5/1–6/15 | 106 |
| Keller, Timothy D. | 153 C | 4/16–10/31 | 1001 |
| | 144 C | 5/1–10/31 | 872 |
| Showell, Jess | 193 C | 4/16–10/31 | 1262 |
| | 105 C | 5/1–10/31 | 636 |
| | 2 H | 4/16–11/15 | 14 |
| Steed, Rick | 109 C | 4/16–10/31 | 713 |
| | 60 C | 5/1–10/31 | 364 |
| Total | | | 10,612 ¹ |

¹ Discrepancy of 10,628 AUMs versus 10,612 AUMs due to rounding error

The group is authorized to use 11 pastures. Eight pastures are designated as spring/fall pastures and used in the three year rest-rotation system and three pastures are used each year as summer range. Figure 2.7 shows the spring/fall and summer pasture groupings. Table 2.5 depicts the specific dates each pasture grouping can be grazed.

Figure 2.7: Pastures rested and grazed in year one of the three year rest rotation system for the BPA group.



Spring/fall pastures are grouped as follows: (South Mills, East Black Pine, West Black Pine), (Bowhuis, North Black Pine), (South Black Pine).

Table 2.5: Pasture sequence and dates for grazing livestock over three years for the BPA group.

| Pasture | Year 1 | Year 2 | Year 3 |
|--------------|------------|------------|------------|
| E Black Pine | 4/16-6/19 | 9/16-10/31 | REST |
| S Mills | 4/16-6/19 | 9/16 10/31 | REST |
| W Black Pine | 4/16-6/19 | 9/16-10/31 | REST |
| S Black Pine | 9/16-10/31 | REST | 4/16-6/19 |
| N Black Pine | REST | 4/16-6/19 | 4/16-6/19 |
| Bowhuis | REST | 4/16-6/19 | 9/16 10/31 |
| Van Koman | 6/20-9/15 | 6/20-9/15 | 6/20-9/15 |
| Trail Canyon | 6/20-9/15 | 6/20-9/15 | 6/20-9/15 |
| Cow Hollow | 6/20-9/15 | 6/20-9/15 | 6/20-9/15 |
| E Cedar Hill | REST | 5/1-6/15 | REST |
| W Cedar Hill | 5/1-6/15 | REST | 5/1-6/15 |

Livestock Management: Two groups of cows are turned out in the spring. The first group can be turned out on April 16 and they generally come from permittees private lands. The second group can turn out on May 1 and these cows generally come from other grazing allotments located in Utah. The April 16 turnout date has been delayed until May 1 for the past few years due to drought conditions. The spring grazing period is the longest duration at 65 days and stocking rates vary between 1 to 2.4 acres/AUM depending on pastures being used. From the spring pastures cows are trailed through various pastures (assigned to them and other permittees) to reach the summer grounds. Requests are often made to move to the summer pastures early, due to drought conditions and reduced forage availability in the spring pastures. The allocated stocking rate in the summer pastures are 5 to 6.3 acres/AUM in the mostly native pastures and 8.4 acres/AUM in the Van Komen pasture which has extensive crested wheatgrass seedings. After 88 days in the summer pastures cattle are trailed to fall pastures. The fall pastures are allocated at a stocking rate ranging from 2 to 3.4 acres/AUM. The difference in spring and fall stocking rates within the same pasture is a result of the grazing duration (Spring = 65 days, Fall = 46 days).

Current review of the grazing management for the BPA group surfaced several concerns. The stocking rates of 1 to 3.4 acres/AUM within an 8-12” precipitation zone appeared to be high, especially with some of the pastures containing an alkali flat ecological site. In converse, an 8.4 ac/AUM stocking rate within a pasture with healthy crested wheatgrass seedings appears low. In 2014 production was read on perennial grasses within all of the spring/fall pastures.

The production data gathered in 2014 showed that the stocking rates are too high in the spring/fall pastures when compared to the estimated available forage produced. Production data collected in the Van Koman summer pasture which showed that there was twice as much forage available than what was allocated. Table 2.6 shows the 1997 allocated AUMs and associated stocking rate (acres/AUM) compared to the 2014 AUM estimates based on grass production. Actual use numbers (AUMs) by pasture are summarized in Appendix H. The table does not split the 2014 estimates into spring or fall, because the number would be the same for both. It is worth noting that only perennial grasses were clipped, therefore it is expected that the available forage is higher on any given year based on shrub, forb and annual vegetation production.

Table 2.6: Stocking Rate comparison (Ac/AUM) between those allocated in the 1997 Decision and 2014 estimates

| Pasture (acres) | Season of Use | Livestock (Number & Kind) | 1997 Allocated Aums | 1997 Stocking Rate (Ac/AUM) | 2014 Estimated Aums | 2014 Stocking Rate (Ac/AUM) |
|----------------------------|---------------|---------------------------|---------------------|-----------------------------|---------------------|-----------------------------|
| East Black Pine (1928 ac) | Spring | 451 C | 964 | 2.0 | 280 | 6.9 |
| | Fall | 451 C | 682 | 2.8 | | |
| West Black Pine (3143 ac) | Spring | 1,099 C | 2,349 | 1.3 | 641 | 4.9 |
| | Fall | 1,099 C | 1,662 | 1.9 | | |
| South Mills (1299 ac) | Spring | 252 C | 539 | 2.4 | 640 | 2.0 |
| | Fall | 252 C | 381 | 3.4 | | |
| Bowhuis (3455 ac) | Spring | 1,189 C | 2,541 | 1.4 | 772 | 4.5 |
| | Fall | 1,189 C | 1,798 | 1.9 | | |
| North Black Pine (2471 ac) | Spring | 613 C | 1,310 | 1.9 | 560 | 4.4 |
| | Fall | 613 C | 927 | 2.7 | | |
| South Black Pine (3534 ac) | Spring | 1802 C | 3,851 | 0.9 | 914 | 3.9 |
| | Fall | 1,802 C | 2,725 | 1.3 | | |
| Van Koman (8645 ac) | Summer | 357 C | 1,033 | 8.4 | 2087 | 4.1 |

The stocking rate of the native summer pastures appears to be adequate based on utilization monitoring and therefore production data was not collected. Permittees within this group have also expressed concern over the lack of available forage within the spring/fall pastures, specifically pastures near the Utah border.

Currently livestock are distributed within a pasture by water and mineral supplement (salt) availability. The pastures are relatively small so even one watering site can support the livestock numbers. The location of watering sites in some pastures is causing livestock use to be higher in one portion of the pasture and lighter in the other. This is the case in pastures that have one watering site and it is located in a corner of the pasture. Increased distribution of water and/or moving existing waters to a more central location would help distribute livestock use.

Pasture Utilization: Utilization and Actual use reports were analyzed for the past ten years (Appendix D, Use Pattern Mapping; Appendix H, Actual Use Information). In 2002 most pastures within this group were used at a moderate (41-60%) to severe (81-100%) level. This trend decreased through time with the majority of pastures receiving moderate (41-60%) to light (21-40%) use starting in 2011. Exceptions to this include the Bowhuis pasture that receives moderate use on average and the Van Koman Pasture which is lightly utilized on average with the lightest use occurring in the northern portion.

Utilization mapping indicates that East Black Pine Pasture receives moderate to heavy use throughout this time period and that the most severe use occurs in conjunction with spring grazing. This pasture was grazed in a Spring, Spring, Fall rotation from 2002-2009 when it change to a Spring, Fall, Rest rotation. The pasture was grazed for eight consecutive years between 2002 and 2009. The West Black Pine Pasture was generally utilized at a moderate level (41-60% use). This pasture was used for five years in a row between 2005 and 2009 when it returned to a Spring, Fall, Rest rotation. The South Mills Pasture has been utilized at a moderate level until the Spring of 2011 when the trend changes to light use. The Bowhuis Pasture is used at least at a moderate level every year it has been monitored since 2000 with the highest use occurring in conjunction with Spring grazing. The North Black Pine Pasture was grazed in a Spring, Spring, Rest rotation from 2000 through 2010. The pasture began being grazed in a Spring, Fall, Rest rotation in 2012. Utilization mapping indicates that the pasture was used at a moderate to severe level all but one year (2009) it was monitored. The South Black Pine Pasture was grazed eight consecutive years (2004-2011). Utilization mapping indicates that the pasture has received at least moderate utilization every year it was monitored except 2011. The Van Koman Pasture is a summer pasture that has routinely been mapped as light to moderate utilization with the majority of the utilization occurring within the middle and southern portion of the pasture. The two summer pastures (Cow Hollow and Trail Canyon pasture) receive heavier grazing pressure in the bottoms along the road corridors, but the majority of the pastures receive light to moderate use. The East Cedar Hills pasture has been mapped at slight use every year it has been monitored. The West Cedar Hills pasture has had varying levels of utilization every year it has been monitored though the majority of the use appears to be concentrated on crested wheatgrass seeding.

Grazing Managemen: Black Pine B (BPB)

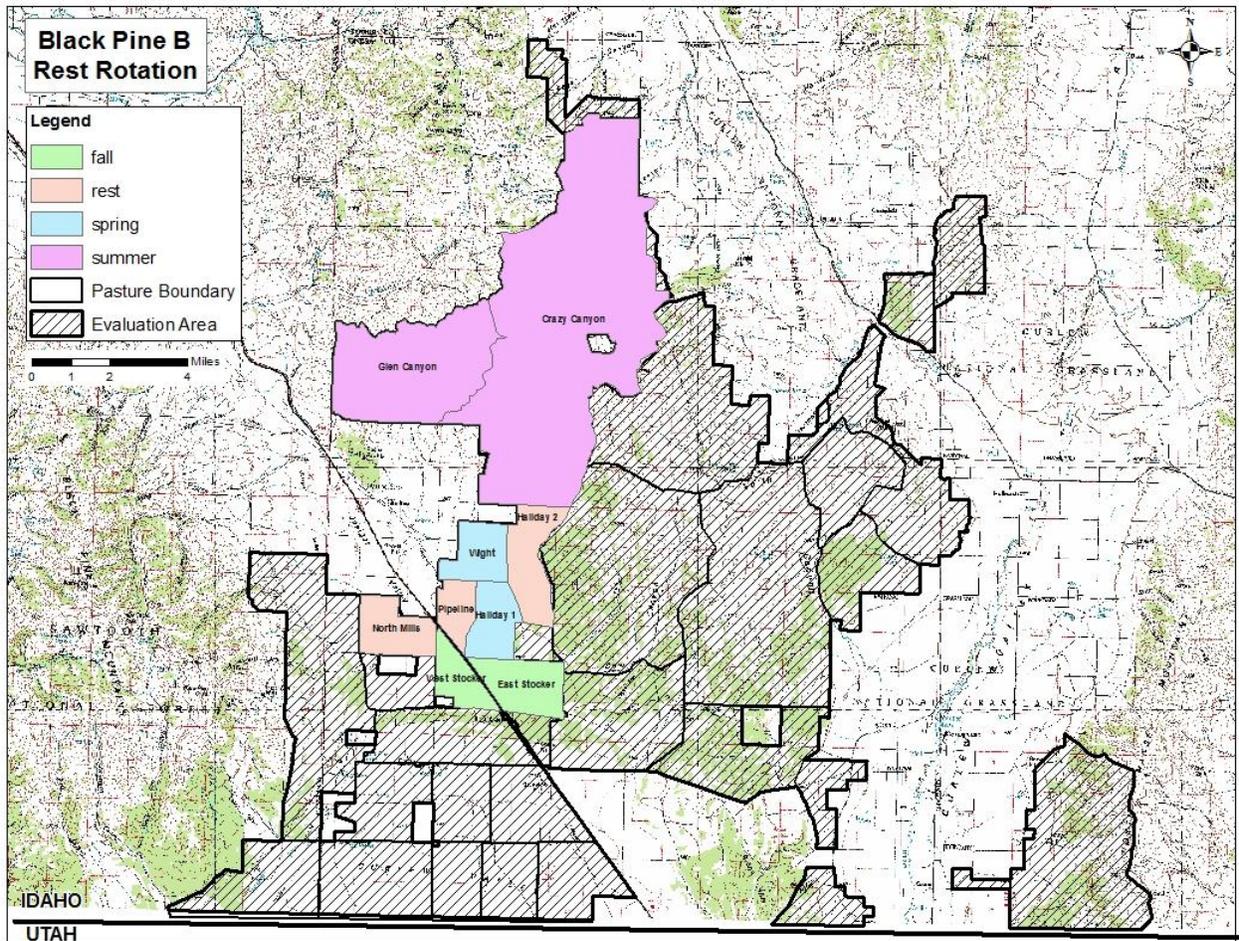
The BPB group is comprised of four permittees authorized to graze approximately 633 cattle and 1,200 sheep. The livestock number, kind, season of use and AUMs authorized in each permittees grazing permit is outline in Table 2.7.

Table 2.7: Authorized use by permittee in Black Pine B group

| Permittee | Livestock Number & Kind | Season-of-Use | Active AUMs |
|---------------------------------|-------------------------|---------------|-------------|
| Bronson Sheep & Cattle Ltd. Co. | 1,200 S | 5/15 – 7/10 | 395 |
| Brandon Buttars | 155 C | 4/16 – 10/31 | 1,014 |
| Hank & Lacey Gem Higley | 279 C | 4/16 – 10/31 | 1,825 |
| Tom & Vauna Wilcock | 199 C | 4/16 – 10/31 | 1,302 |
| | | Total = | 4,536 |

The group is authorized to use 9 pastures. Seven pastures are designated as spring/fall pastures and used in the 3 year rest-rotation system and 2 pastures are used each year as summer range. Figure 2.8 shows the spring/fall and summer pasture groupings. Table 2.8 depicts the specific dates each pasture grouping can be grazed.

Figure 2.8: Pastures rested and grazed in year one of the three year rest rotation system for the BPB group.



Spring/fall pastures are grouped as follows: (West Stocker, East Stocker), (Wight, Haliday 1), (Pipeline, North Mills, Haliday 2).

Table 2.8: Pasture sequence and dates for grazing livestock over three years for the BPB group.

| Pasture | Year 1 | Year 2 | Year 3 |
|------------|------------|------------|------------|
| Holiday #2 | REST | 4/16-6/19 | 9/16-10/31 |
| N Mills | REST | 4/16-6/19 | 9/16-10/31 |
| Pipeline | REST | 4/16-6/19 | 9/16-10/31 |
| Holiday #1 | 4/16-6/19 | 9/16-10/31 | REST |
| Wight | 4/16-6/19 | 9/16-10/31 | REST |
| E Stocker | 9/16-10/31 | REST | 4/16-6/19 |
| W Stocker | 9/16-10/31 | REST | 4/16-6/19 |
| Crazy Cyn | 6/20-9/15 | 6/20-9/15 | 6/20-9/15 |
| Glen Cyn | 6/20-9/15 | 6/20-9/15 | 6/20-9/15 |
| Glen Cyn | 5/15-7/10 | 5/15-7/10 | 5/15-7/10 |

Livestock Management: Sheep are authorized to one permittee and are restricted to the Glen Canyon pasture. Sheep use is typically associated with trailing through the pasture to Forest Service lands with a grazing duration of 4-5 days, even though sheep are authorized much longer.

Cattle use occurs within all of the pastures and are run by the remaining 3 permittees. Generally Brandon Buttars and Tom Wilcock run together in a pasture and the Higley's run in a pasture. This split usually works well, however in times of drought or low forage production the permittee running in the Wight and West Stocker pastures often run out of forage earlier than the permittees in the other assigned pastures. Typically when forage utilization levels are met in these pastures the permittee (Higley) has moved cattle onto private lands. The 1997 decision does not allocate pastures to permittees assuming that all the cattle run together, which would alleviate this problem. The unofficial assignment of pastures has also lead to a separation in range improvement maintenance within the group. Lack of maintenance of pipelines & troughs is an issue in the Pipeline and North Mills Pastures which has resulted in reduced water availability. Wildfires have occurred in most spring/fall pastures re-invigorating the crested seedings contained within them. The Wight and West Stocker pastures have a high percent cover of sagebrush that has reduced the forage amount produced by the seedings. The current combination of pastures assigned by the 1997 decision is no longer a good match-up and a re-assignment of pastures should occur. Increased watering sites and/or relocation of watering sites would aid livestock distribution.

Cattle are trailed from spring pastures to summer pasture and then trailed back to fall pastures. This group only trails through pastures that are allocated to them. The Crazy Canyon pasture (summer) is used in combination with Group Black Pine C. This is the only pasture where two different groups run cattle together. In order for livestock to trail into the Crazy Canyon pasture both groups must travel through the Haliday 2 pasture (spring/fall). This causes the north end of the pasture to be used every year while cattle are gathered and pushed in and out of the summer pasture.

Pasture Utilization: Utilization and Actual use reports were analyzed for the past ten years (Appendix D, Use Pattern Mapping; Appendix H, Actual Use Information). For the majority of the pastures within this group utilization mapping has shown slight to moderate use, the exceptions being East and West Stocker pastures.

Utilization levels appear to be decreasing within the Haliday-1 pasture. Utilization levels were generally moderate (41-60% use) from 2002-2008, but starting in 2009, use has generally consisted of light use (21-40% use). Heavy use was documented within the Haliday-2 pasture during the early 2000's; however use has not been recorded above moderate utilization since 2005. Utilization of the Pipeline and Wight pastures has generally been moderate (41-60% use). Utilization mapping has generally documented moderate (41-60% use) to heavy (61-80% use) use of both the East and West Stocker pastures. The north Mills pasture is rarely documented as receiving greater than light use; however the pasture was used for five consecutive years between 2009 and 2013. The two summer pastures (Crazy Canyon and Glen Canyon pasture) receive heavier grazing pressure in the bottoms along the road corridors, but the majority of the pastures receive light to moderate use, with Glen Canyon pasture receiving more moderate use than Crazy Canyon pasture.

Grazing Management: Black Pine C (BPC)

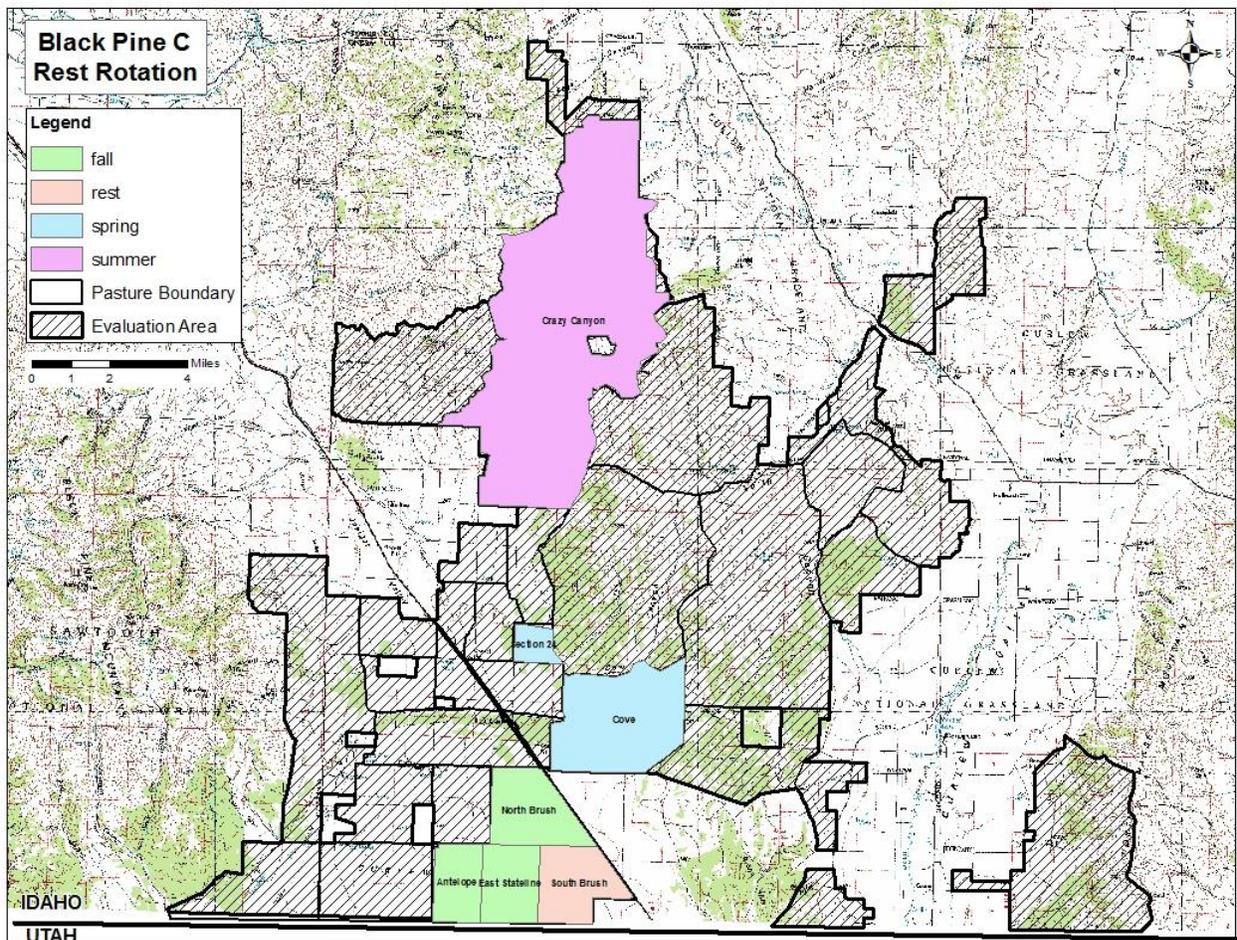
The BPC group is comprised of one permittee authorized to graze approximately 853 cattle and 14 horses. Based on actual use reports, horses have not been run. The livestock number, kind, season of use and AUMs authorized in the permittee grazing permit is outline in Table 2.9.

Table 2.9: Authorized use by permittee in Black Pine C group.

| Permittee | Livestock Number & Kind | Season-of-Use | Active AUMs |
|----------------------------|-------------------------|---------------|-------------|
| The Rose of Snowville, LLC | 427 C | 4/16 – 10/31 | 2794 |
| | 259 C | 5/1 – 10/31 | 1567 |
| | 167 C | 5/1 – 6/15 | 253 |
| | 167 C | 8/31 – 10/31 | 340 |
| | 55 C ¹ | 6/16 – 8/30 | 137 |
| | 15 H | 4/16 – 9/30 | 83 |
| | 6 H | 10/1 – 11/15 | 9 |
| | Total | | 5,183 |

This permittee is authorized to use 7 pastures. Six pastures are designated as spring/fall pastures and used in the 3 year rest-rotation system and 1 pasture is used each year as summer range. Figure 2.9 shows the spring/fall and summer pasture groupings. Table 2.10 depicts the specific dates each pasture grouping can be grazed.

Figure 2.9: Pastures rested and grazed in year one of the three year rest rotation system for the BPC group.



Spring/fall pastures are grouped as follows: (Antelope, East Stateline, North Brush), (Section 24, Cove), (South Brush).

Table 2.10: Pasture sequence and dates for grazing livestock over three years

| Pasture | Year 1 | Year 2 | Year 3 |
|--------------|------------|------------|------------|
| S Brush | REST | 4/16-6/19 | 9/16-10/31 |
| Section 24 | 4/16-6/19 | 9/16-10/31 | REST |
| Cove | 4/16-6/19 | 9/16-10/31 | REST |
| Antelope | 9/16-10/31 | REST | 4/16-6/19 |
| N Brush | 9/16-10/31 | REST | 4/16-6/19 |
| E Stateline | 9/16-10/31 | REST | 4/16-6/19 |
| Crazy Canyon | 6/20-9/15 | 6/20-9/15 | 6/20-9/15 |

Livestock Management: The Rose Ranch is the only permittee authorized to graze within the seven allocated pastures providing more flexibility as a single operator. Livestock are trailed into the spring pastures from the permittees private lands located in Utah that are adjacent to the allotment. Cattle are trailed into the allotment in smaller groups taking approximately 4-7 days to move the cattle into and between spring, summer and fall pastures.

During the 2013 assessment process concerns surfaced regarding the amount of available forage for livestock within spring/fall pasture located in the 8-12” precipitation zone. Production data was collected in 2014 to address these concerns. Table 2.11 shows the 1997 allocated AUMs and associated stocking rate (acres/AUM) compared to the 2014 AUM estimates based on grass production. Actual use numbers (AUMs) by pasture are summarized in Appendix H. The table does not split the 2014 estimates into spring or fall, because the number would be the same for both. It is worth noting that only perennial grasses were clipped, therefore it is expected that the available forage is higher on any given year based on shrub, forb and annual vegetation production. The information obtained by the 2014 production estimates showed that in 2014 the amount of available forage was less than half of what could be run in the spring as allocated by the 1997 decision. The Antelope pasture showed a significant discrepancy in available forage compared to what is currently allocated. All of these pastures contain the Alkali Flat 8-12” ecological site which is a low production site. All of these pastures had been seeded in the past; however it appears that where the alkali soils are dominant the seeding did not take or the seeded plants died out over time.

Table 2.11: Stocking Rate comparison (Ac/AUM) between those allocated in the 1997 Decision and 2014 estimates

| Pasture (acres) | Season of Use | Livestock (Number & Kind) | 1997 Allocated Aums | 1997 Stocking Rate (Ac/AUM) | 2014 Estimated Aums | 2014 Stocking Rate (Ac/AUM) |
|-----------------------|---------------|---------------------------|---------------------|-----------------------------|---------------------|-----------------------------|
| Antelope (1561 ac) | Spring | 154 C | 329 | 4.7 | 68 | 23.0 |
| | Fall | 154 C | 233 | 6.7 | | |
| North Brush (2556 ac) | Spring | 640 C | 1,368 | 1.9 | 555 | 4.6 |
| | Fall | 640 C | 968 | 2.6 | | |
| South Brush (2329 ac) | Spring | 324 C | 692 | 3.4 | 348 | 6.7 |
| | Fall | 324 C | 490 | 4.8 | | |

* The allocated AUMs was the maximum use in the pasture identified in the 1997 decision, however annual actual use varies (Actual Use Table Appendix H).

Currently livestock are distributed within a pasture by water and mineral supplement (salt) availability. Increased distribution of water and/or moving existing waters to a more central location would help distribute livestock use.

Pasture Utilization: Utilization and Actual use reports were analyzed for the past ten years (Appendix D, Use Pattern Mapping; Appendix H, Actual Use Information). The Section 24 pasture is usually grazed at a moderate utilization level and in the spring. The Cove pasture generally receives moderate utilization with

some instances of heavy use. The pasture was used four consecutive years between 2009 and 2012 in a Spring, Spring, Fall rotation. The Antelope pasture has been mapped for utilization three times over the past 14 years and has been mapped at heavy or severe use two of those times. The pasture was used four consecutive years between 2007 and 2010. Similarly, the East Stateline pasture has been mapped as moderate to heavy use all but one year it has been monitored. North and South Brush pastures were generally utilized at a moderate to heavy rate but the past two years of monitoring data (2011 and 2012) have shown a decrease in utilization levels for both pastures. The summer pasture (Crazy Canyon) has already been discussed above under Pasture Utilization for the Black Pine B Group.

Grazing Management, Holbrook Group

The Holbrook group is comprised of four permittees authorized to graze approximately 390 cattle. The livestock number, kind, season of use and AUMs authorized in each permittees grazing permit is outline in Table 2.12.

Table 2.12: Authorized use by permittee in Holbrook group.

| Permittee | Livestock Number & Kind | Season-of-Use | Active AUMs |
|-----------------------|-------------------------|---------------|-------------|
| Dallan & Cindy Nalder | 130 C | 4/16-9/30 | 652 |
| Shad & LaNae Nalder | 83 C | 4/16-9/30 | 420 |
| Kent & Pat Smith | 104 C | 4/16-9/30 | 525 |
| Kevin Smith | 73 C | 4/16-9/30 | 365 |
| | | Total = | 1,962 |

The group is authorized to use six pastures. Two pastures are designated as spring pastures only and are used in alternate years allowing the other one to be rested (North Bowen & South Bowen) and the remaining pastures are used every year in an early summer and late summer deferred system. The only summer pastures that are used are Meadow Divide and Holbrook Burn. Figure 2.10 shows the spring/fall and summer pasture groupings. Table 2.13 depicts the specific dates each pasture grouping can be grazed.

Figure 2.10: Pastures rested and grazed in year one of the three year rest rotation system for the Holbrook group.

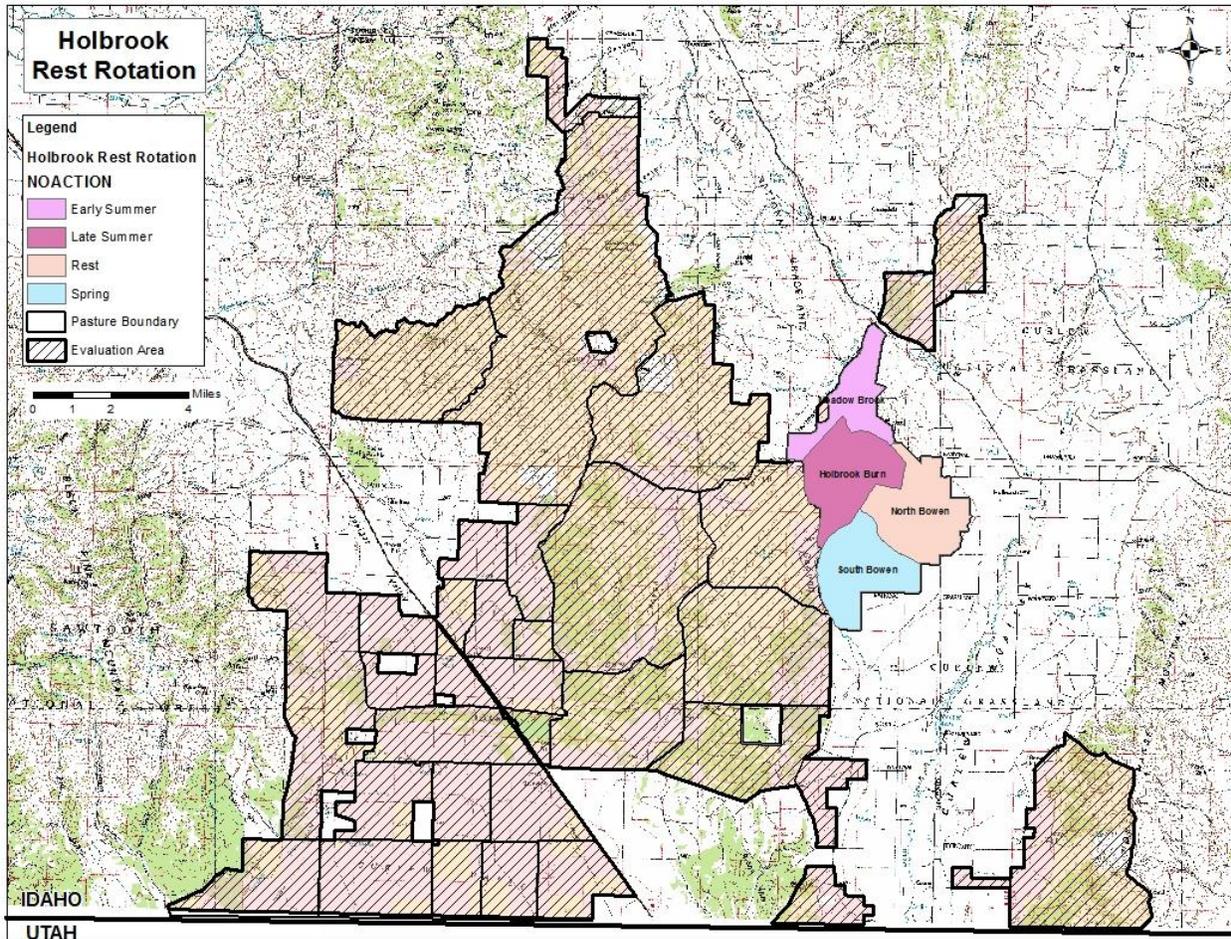


Table 2.13: Pasture sequence and dates for grazing livestock

| Pasture | Year 1 | Year 2 |
|---------------|-----------|-----------|
| N Bowen | 4/16-6/19 | REST |
| S Bowen | REST | 4/16-6/19 |
| Meadow Divide | 8/10-9/30 | 6/20-8/9 |
| Holbrook Burn | 6/20-8/9 | 8/10-9/30 |
| N Canyon-N | 8/10-9/30 | 6/20-8/9 |
| N Canyon-S | 6/20-8/9 | 8/10-9/30 |

Livestock Management: All of the livestock authorized are run together. Typically the group has delayed turn-out until May 1 each year. Use of North Canyon (N ½, S ½) is authorized, but it is not used because the group is only authorized to run 59 cattle out of the groups 356. Splitting off such a small percent of the livestock and mixing them in with the Stone Group, who runs all of their livestock in these pastures in the summer, is not feasible. The current rotation, as implemented in the 97 decision, is not optimal because of the size of the pastures and timeframes in which the group must graze. The two spring pastures are the largest pastures with the most available forage and the Meadow Divide pasture has better spring forage than summer. The Meadow Brook pasture is rugged country with water developed in canyons with natural springs. Canyons tend to be steep with grass and low sagebrush communities with less production on with rocky ridges and steep slopes. Permittees contend that they should not be in Meadow Brook more than ~28 days, and that they usually try to

minimize their grazing period in most years. The permittees have requested that the rotation be changed to allow for more flexibility.

Pasture Utilization: Prior to 2008 utilization mapping indicates that both the North and South Bowen pastures were utilized at higher rates (moderate to high utilization). Since 2008, both pastures have generally been utilized at a light to slight rate with isolated pockets of moderate use occurring. Utilization mapping of the Hobrook Burn pasture indicates that the pasture is generally used at a light (21-40%) rate. This pasture is generally used as a Summer or Fall pasture. The Meadow Brook Divide pasture was used four years consecutively, from 2010 to 2013. Utilization mapping of the pasture during this time period indicates light use. This is a reduction from the levels documented prior to the 2006-2007 fires when the pasture was generally used at a moderate rate. The North Canyon pastures (North Canyon North ½ and North Canyon South 1/2) will be discussed in combination. This is because there is no physical barrier between the two pastures. Utilization mapping indicates that utilization rates have decreased since 2008, but that utilization has generally occurred at a light (21-40%) rate.

Grazing Management: Stone Group

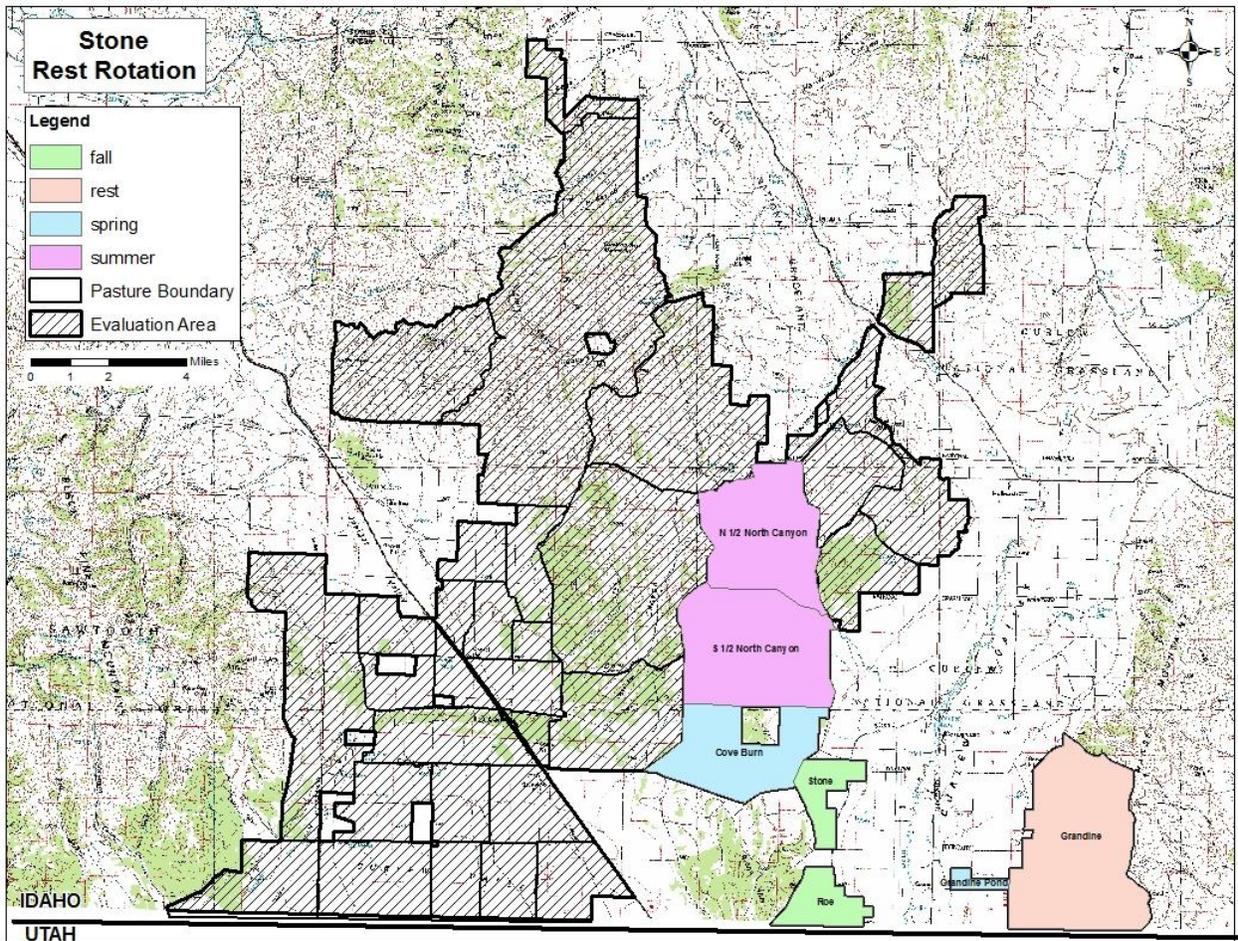
The Stone group is comprised of seven permittees authorized to graze approximately 478 cattle and 4 horses. Based on actual use reports, horses have not been run since they were authorized in 1997. The livestock number, kind, season of use and AUMs authorized in each permittees grazing permit is outline in Table 2.14.

Table 2.14 Authorized use by permittee in Stone group

| Permittee | Livestock Number & Kind | Season-of-Use | Active AUMs |
|----------------------------|-------------------------|---------------|-------------|
| Ron L. Anderson | 92 C | 4/16-5/30 | 136 |
| Rod Arbon | 19 C | 5/1-9/30 | 96 |
| Troy Jess & Tyler J. Arbon | 47 C | 5/1-9/30 | 237 |
| N. Alden Neal | 43 C | 4/16-9/30 | 238 |
| R. & V. Neal Ranches, Inc. | 170 C | 4/16-9/30 | 955 |
| | 170 C | 10/1-11/15 | 258 |
| | 2 H | 4/16-11/15 | 14 |
| Sid & Sharon Showell | 73 C | 4/16-9/30 | 418 |
| | 73 C | 10/1-11/15 | 111 |
| | 2 H | 4/16-11/15 | 14 |
| Lyle Steed | 34 C | 5/1-9/30 | 188 |
| | | Total AUMs = | 2,637 |

The group is authorized to use seven pastures, one of which (Grandine Pond) can only be used by Ron Anderson. Four pastures are designated as spring/fall pastures and used in the 3 year rest-rotation system and 2 pastures are used each year as summer range. Figure 2.11 shows the spring/fall and summer pasture groupings. Table 2.15 depicts the specific dates each pasture grouping can be grazed.

Figure 2.11: Pastures rested and grazed in year one of the three year rest rotation system for the Stone group.



Spring/fall pastures are grouped as follows: (Grandine), (Stone, Roe), (Cove Burn).

Table 2.15: Pasture sequence and dates for grazing livestock over three years

| Pasture | Year 1 | Year 2 | Year 3 |
|---------------|------------|------------|------------|
| Cove Burn | 4/16-6/19 | 10/1-11/15 | REST |
| Grandine | REST | 4/16-6/19 | 10/1-11/15 |
| Grandine Pond | REST | 5/1-6/15 | 5/1-6/15 |
| N Canyon-N | 6/20-8/9 | 8/10-9/30 | 8/10-9/30 |
| N Canyon-S | 8/10-9/30 | 6/20-8/9 | 6/20-8/9 |
| Stone | 10/1-11/15 | REST | 4/16-6/19 |
| Roe | 10/1-11/15 | REST | 4/16-6/19 |

Livestock Management: There is a wide range of seasons of use durations within this group. One permittee grazes 92 cattle only between 4/16 – 5/30 (45 days) and is authorized for use only in the Grandine pastures. Two permittees have a 153 day grazing season (5/1 – 9/30) and two permittees have a 168 day grazing season (4/16 – 9/30) allowing them to graze in the spring and summer pastures. The remaining two permittees have a 214 day grazing season (4/16 – 11/15) allowing them to use spring, summer and fall pastures. Under the currently authorized system, fall use is approximately 30% of what is used in the spring providing light use of fall pastures.

No physical barrier exists between the North Canyon North ½ and North Canyon South ½ pastures. Permittees rotate turnout between the North ½ and the South ½ yearly, however cattle do drift throughout both pastures.

Currently livestock are distributed within a pasture by water and mineral supplement (salt) availability. The Grandine pasture has poor distribution due to steep topography and limited water distribution. Increased watering sites in the southern portion of the pasture could increase use within that area.

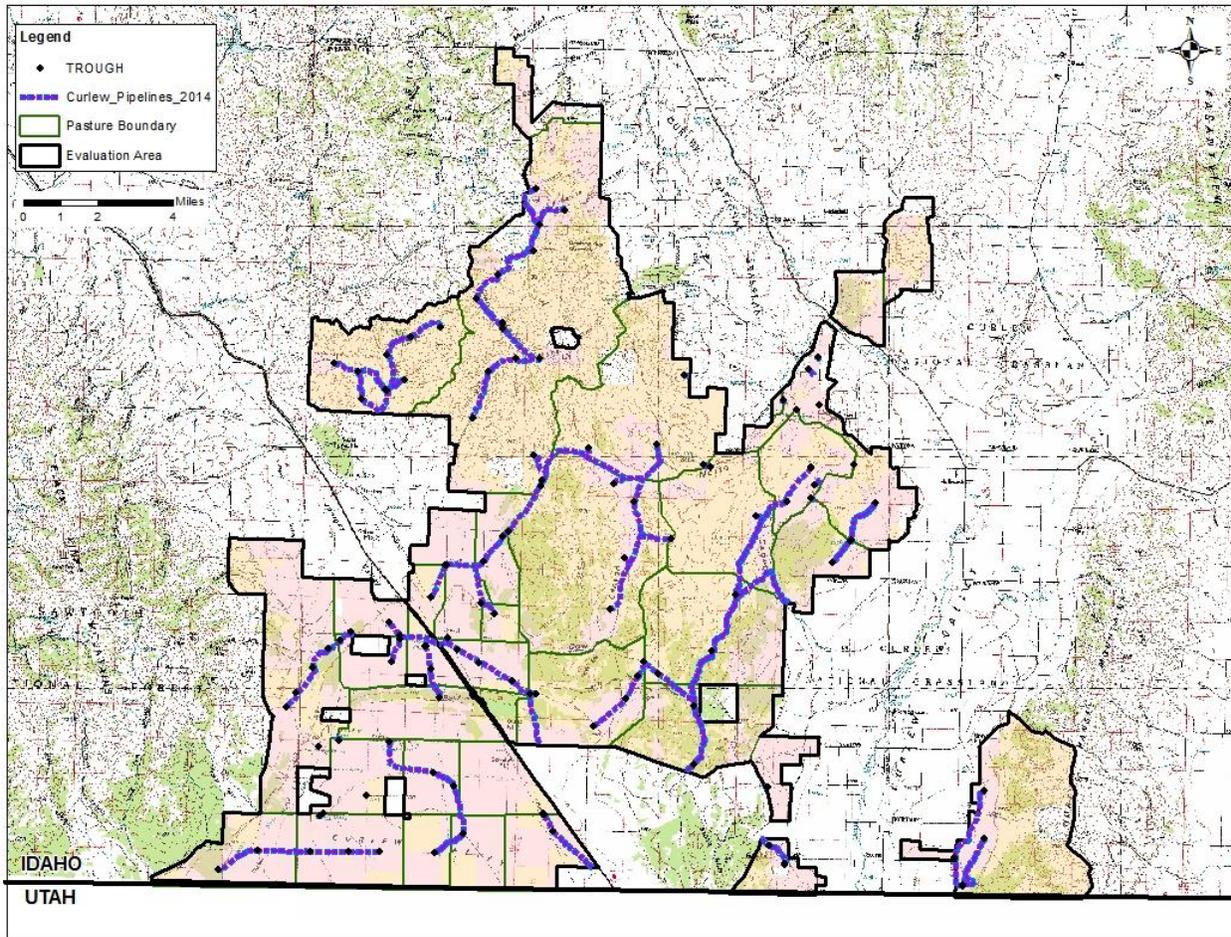
Pasture Utilization: Grandine Pond pasture is used as a Spring pasture and is generally utilized at a moderate rate with some instances of heavy utilization. Grandine pasture has been utilized for the past ten years consecutively from 2004-2014 but at varying rates of actual use. Every third year the pasture is utilized at approximately a fifth of the level it is utilized the other two years. Use is primarily limited to the seeded portion of the pasture with little to no use occurring within the steep slopes associated with the native vegetation. Within the seeded portion of the pasture, utilization is generally at moderate to heavy use rates. Utilization mapping indicates that utilization rates have decreased within the Cover Burn pasture since 2006, when utilization rates were generally moderate to light since 2006. The pasture was utilized five consecutive years between 2008 and 2012. Use pattern mapping indicates that the majority of the utilization occurs within the seeded portion of the pasture. Between 2004 and 2009 the Stone pasture was utilized every year according to Actual Use records. During this same time period, Use pattern mapping shows that the pasture was generally used at a light to moderate rate. Beginning in 2010, the rest rotation grazing system was re-implemented and the utilization mapping indicates that utilization decreased to generally light use. The Roe pasture is seldom used but utilization mapping indicates that use varies between slight to heavy use depending on the year. The summer pastures (North Canyon North ½ and North Canyon South 1/2) have already been discussed above under Pasture Utilization for the Holbrook Group.

F. Range Improvements

Range resources include those improvements meant to aid in the proper management of livestock. They may include but are not limited to wells, pipelines, troughs, tanks, cattleguards, and fences. In 2014, an extensive inventory and assessment of the pipelines and associated infrastructure was completed.

i. Wells, Pipelines & Troughs

Figure 2.12: Map of approximate locations of Pipelines and troughs in the Evaluation Area as of 2014.



There are currently 11 wells, 9 water tanks, 1 reservoir, 2 pumps, approximately 87 miles of pipeline, and approximately 145 troughs located within the evaluation area. The majority of the pipelines were installed over 10-20 years prior to the assessment of 2013. Therefore, any vegetative disturbances associated with these pipelines have since re-vegetated. Occasional, small disturbances do occur in association with normal maintenance to the pipelines.

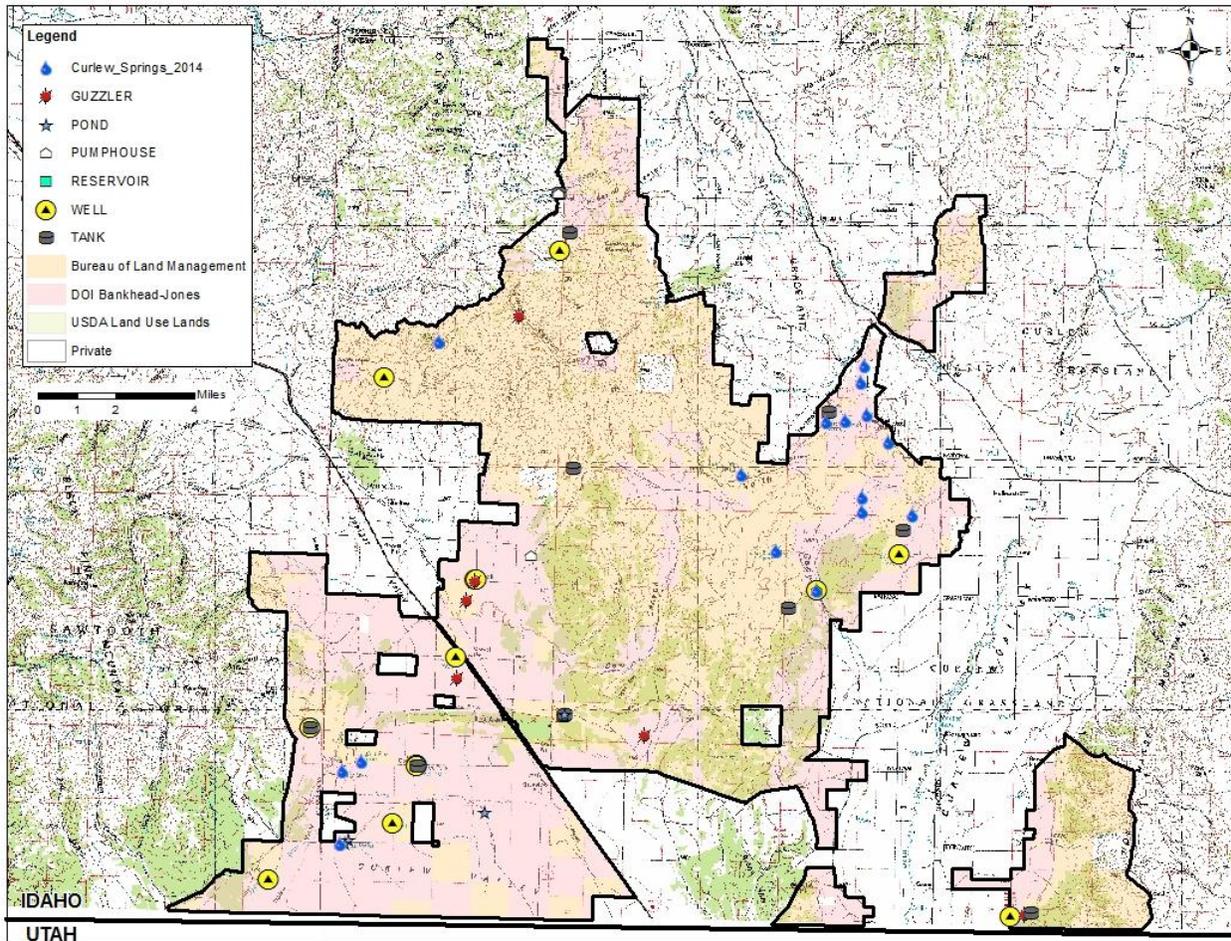
Small disturbance areas are usually associated with trough locations. These areas are usually devoid of shrub cover and have reduced perennial grass and forb canopy cover. They may also have an increase in percent bare ground and annual grass and forb canopy cover. These areas usually do not exceed one acre in size, though this does vary depending on the size and location of the trough. Most troughs are located within the valley bottoms when located within steep terrain.

Several of the troughs within the evaluation area could use some minor maintenance in the form of gravel skirts around concrete bases of the 6,500 gallon round troughs, and removal of old, disconnected troughs. There are a few troughs located along functioning pipelines which are not in functioning condition that need repair.

The pipeline originating at North Canyon Spring supplies water to several pastures and different permittee groups through an extensive gravity fed pipeline from a 40,000 gallon storage tank. The storage tank is a redwood tank that has been in place for over 25 years and is now starting to leak. This tank should be replaced. A portion of this pipeline also supplies water to the South Stone Allotment #06002 (outside this evaluation area) adding approximately 16 miles of pipeline and 24 troughs to the current water system. Several pipelines that

were installed 15-20 years ago are beginning to require high maintenance and several sections should be replaced.

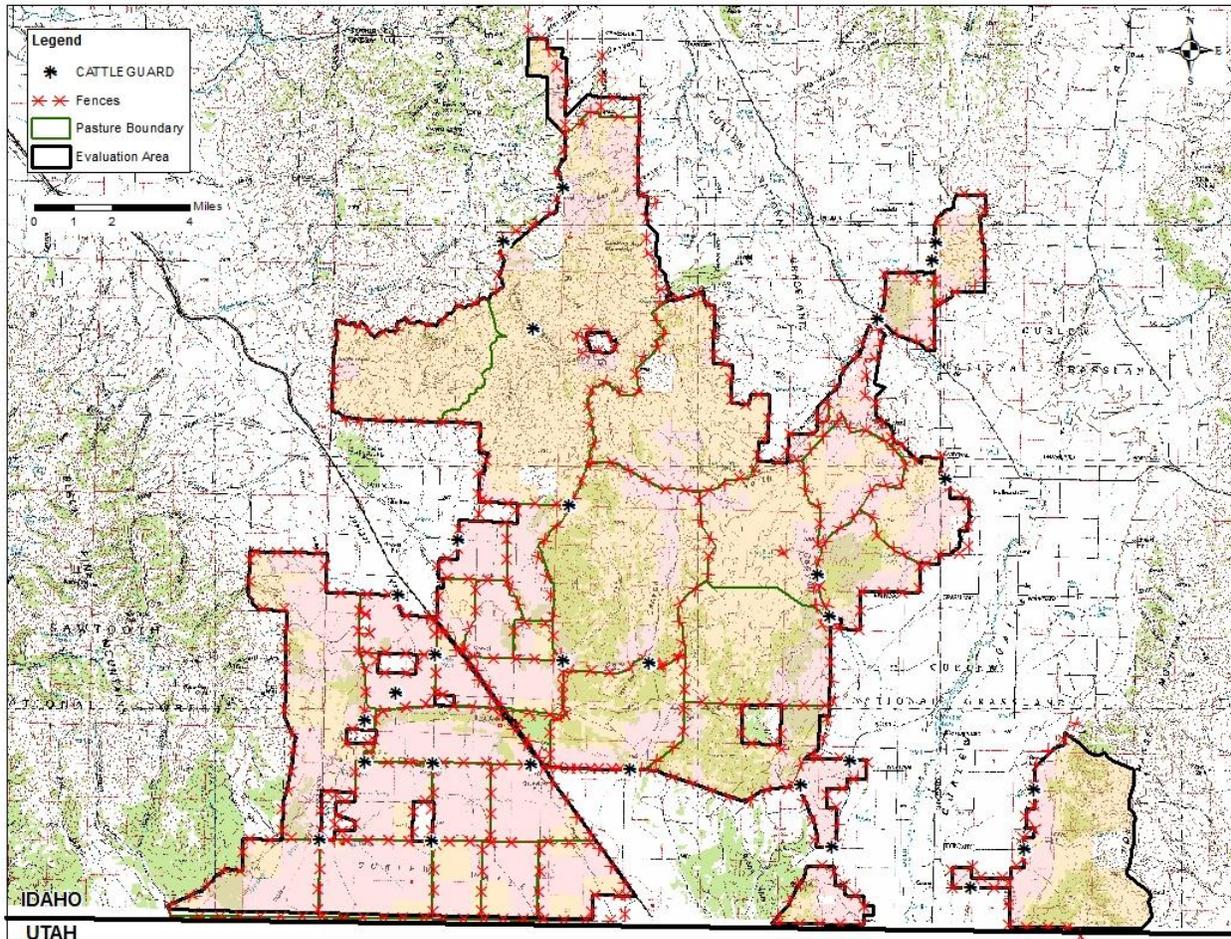
Figure 2.13: Map of springs, wells, reservoirs, water holding tanks, pumps and cattleguards located within the Evaluation Area.



There are 16 springs within the evaluation area all of which have been developed and have a range improvement associated with them. The spring developments consist of capturing all or a portion of the ground water into a collection box and then piping the water to a trough. The majority of these are not floated and so excess water from the trough is piped to a small man made pond or piped into a small channel. Retro-fitting the spring developments through installation of shutoff valves at the spring sources and floats on the troughs should be considered. Exclosure fences have been built around all of the spring sources however the integrity of the fences varies. Most are well maintained however some are in disrepair. Separate overflow exclosures are associated with several of the springs. Most of these structures are in severe disrepair. The possibility of abandoning these structures and removing them from the landscaped should be considered. The springs are covered in greater depth under Section III, Existing Resources, subsection F, Wetland and Riparian Zones.

ii. Fences

Figure 2.14: Approximate location of fences within the Evaluation Area as of 2013.



Currently there are approximately 26 cattle guards and 337 miles of fences around and within the evaluation area. This figure is based off range improvement files and aerial photos from 2011. Not all fence lines that occur on the landscape have been captured in this estimate. There is currently no fence between the North Half of the North Canyon Pasture and the South Half of the North Canyon Pasture. Other pasture boundaries are formed by topographic features such as steep rugged terrain (i.e. Glen Canyon Pasture and Crazy Canyon Pasture).

III. ASSESSMENT OF EXISTING RESOURCES

This section describes the current condition of relevant resources which are identified in Table 3.1. In determining relevant resources several sources were considered and reviewed including comments received by interested/affected parties, and government agencies. The condition of several resources was determined through assessments that were conducted employing a number of different monitoring techniques including: Land Health Assessments (Interpreting Indicators of Rangeland Health; BLM Tech Ref. 1734-6), Habitat Assessment Framework (Aug 2010), Proper Functioning Condition (PFC) (Tech. Ref. 1737-11 and Tech. Ref. 1737-9), Weed Inventories, Photo Monitoring, Key Species Method (Tech. Ref. 1734-3) and observations.

Table 3.1: Relevant Resources for the Evaluation Area

| |
|------------------------------------|
| Resource |
| Cultural |
| Vegetation |
| Soils |
| Special Status Plants |
| Water Quality (Surface and Ground) |
| Wetland and Riparian Zones |
| Wildlife |
| Migratory Birds |
| Special Status Animals |

A. Cultural

Within the evaluation area there are approximately 152 known archaeological sites (BLM Cultural Report 2011-PFO-22). This includes 89 prehistoric sites, 56 historic sites, 6 sites with both historic and prehistoric components, and one historic trail (Hudspeth’s Cutoff). Prehistoric sites include lithic scatters, campsites, rock features, and lithic sources. Historic sites include several homesteads, dumps/trash scatters, prospects, canals, earthen dams, and cairns.

In 2013, a contractor conducted a sample cultural resource inventory (Cultural Report # 2014-PFO-5) within the Pocatello Field Office including several locations within the evaluation area. Many of the locations were chosen due to evidence of livestock congregation (e.g. troughs and springs) and or livestock use. The contractor inventoried 86 locations for a total of 205 acres within the evaluation area. Nothing was found at 77 locations, however, 9 newly identified or re-recorded sites were found at the remaining locations. Of those 9 sites, 3 were identified as being impacted. At site 10OA32, impacts included looting (illegal artifact collecting) and livestock, at site 10OA27, impacts included livestock, and at site 10OA15, impacts included looting, erosion, fire, and a range improvement development. Some sites have already been protected from livestock damage through protective fences, such as site 10OA15. Other sites such as sites 10OA32 and 10OA27 still need to be protected from further damage, particularly from cattle congregation.

In 2014, the PFO archaeologist re-visited 2 known prehistoric sites within the evaluation area. The original site form for site 10OA16 identifies the impacts as a range development and livestock. Livestock continue to congregate at this location and impact the site. The original site form for site 10OA25 lists excavation and possible looting as impacts to the site. The “excavation” the form refers to is most likely from a range development. Livestock use was noted during the 2014 visit. Sites 10OA16 and 10OA25 need to be protected from further damage, possibly through the exclusion of livestock.

Impacts to sites within the evaluation area include but are not limited to fire, erosion, illegal artifact collecting (looting), range developments, and livestock congregation. The historic homesteading and agricultural development of the area also impacted many prehistoric sites. Fire has probably been one of the biggest impacts to historic sites. For example, the Van Komen homestead was lost to a fire in 2006.

B. Vegetation

The evaluation area has a diverse spectrum of precipitation zones, soil profiles and topography creating diversity in vegetation and vegetative communities. Historic land use and seeding of public land acquired under the Bankhead Jones Act (approximately 36,267 acres) has resulted in large non-native vegetative communities (crested wheatgrass seedings). Native plant communities occur primarily within the hills and mountainous areas that were not acquired under the Bankhead Jones Act. Within the native sites, juniper encroachment into sagebrush communities occurred and created large expanses of juniper dominated areas (Phase II and Phase III)

well outside their normal range of variation for the sites. Phase II juniper encroachment refers to conditions in which junipers are co-dominant with shrubs and herbaceous species while Phase III juniper encroachment refers to a condition in which junipers are the dominant vegetation. This increase in juniper cover has been shown to decrease native shrub and herbaceous cover (USGS Circular 1335). The majority of the encroachment areas were burned in 2006-2007 leaving a modified/degraded vegetative community to re-vegetate. However, isolated juniper encroached areas remain on the landscape.

The following discussion of vegetation is broken into several sections to better address the variety of expected and existing vegetative communities within the evaluation area. The first few sections will provide an overview of the ecological sites, unique vegetative areas and existing native vegetation followed by crested wheatgrass seedings. The last section will conclude with a more detailed description of the vegetation within grazing pastures; this is done because there is a variation in grazing intensity, duration, and timing between pastures which has led to differences in current vegetation condition.

i. Ecological Site Descriptions

“An ecological site is a conceptual division of the landscape that is defined as a distinctive kind of land based on recurring soil, landform, geological, and climate characteristics that differs from other kinds of land in its ability to produce distinctive kinds and amounts of vegetation and in its ability to respond similarly to management actions and natural disturbances.” (Interagency Ecological Site Handbook for Rangelands, 2013)

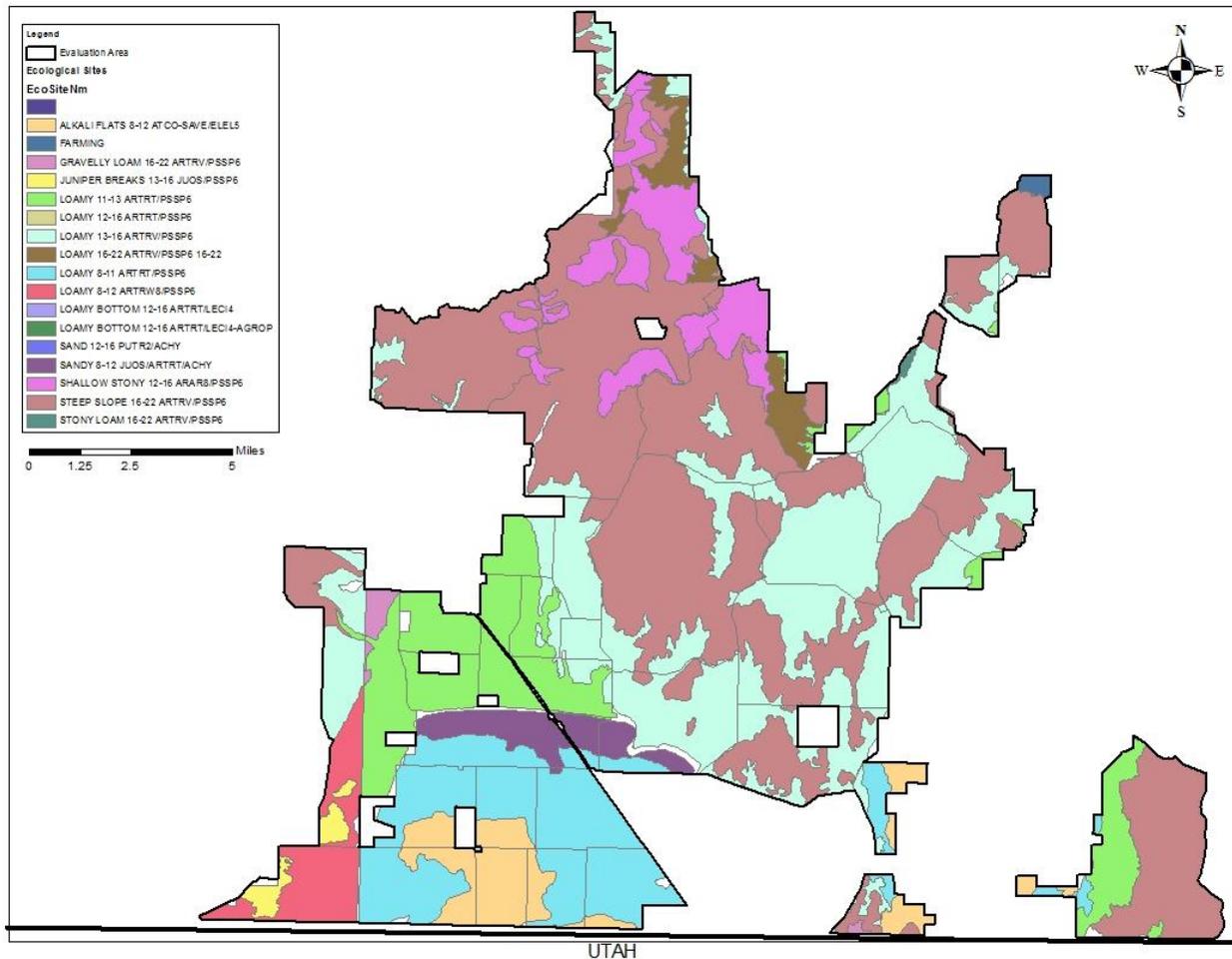
Thirteen distinctive ecological sites occur within the evaluation area. The dominant ecological sites have variations of big sagebrush & bluebunch wheatgrass as the key vegetation. Table 3.2 summarizes the number of acres within each ecological site. Figure 3.2 depicts the location of the ecological sites within the evaluation area.

Table 3.2 - Ecological Sites within the evaluation area.

| Ecological Site Description | Acres |
|------------------------------------|------------------|
| Alkali Flats 8-12 ATCO/ELEL5 | 5,880 |
| Gravelly Loam 16-22 ARTRV/PSSP6 | 623 |
| Juniper Breaks 13-16 JUOS/PSSP6 | 916 |
| Loamy 11-13 ARTRT/PSSP6 | 12,621 |
| Loamy 13-16 ARTRV/PSSP6 | 24,748 |
| Loamy 16-22 ARTRV/PSSP6 | 2,782 |
| Loamy 8-11/12 ARTRT/PSSP6 | 18,545 |
| Loamy Bottoms 12-16 ARTRT/LECI4 | 47 |
| Sand 12-16 PUTR2/ACHY | 23 |
| Sandy 8-12 JUOS/ARTRT/ACHY | 3,015 |
| Shallow Stony 12-16 ARAR8/PSSP6 | 7,279 |
| Steep Slopes 16-22 ARTRV/PSSP6 | 52,354 |
| Undefined | 7,616 |
| Total | 136,449 * |

* includes 2,482 acres of private land

Figure 3.1: Ecological sites identified within the evaluation area



ii. Lake Bonneville Shoreline Juniper Band

Within the evaluation area approximately 2,108 acres of juniper exist in an arched band near Black Pine Road. This band appears to correspond with the ancient shoreline of Lake Bonneville. It is mapped as a Sandy 8-12 JUOS/ARTRT/ACHY site (Figure 3.4), and the junipers within the site are mature trees that were mapped on the original 1915 plats. This site appears to be a unique vegetative area within the evaluation area. This area was not assessed using land health indicators because an ecological site description is not available. The area is described in greater detail in the detailed pasture descriptions for the Bowhuis and Rest Stop Pastures.

iii. Upland vegetation

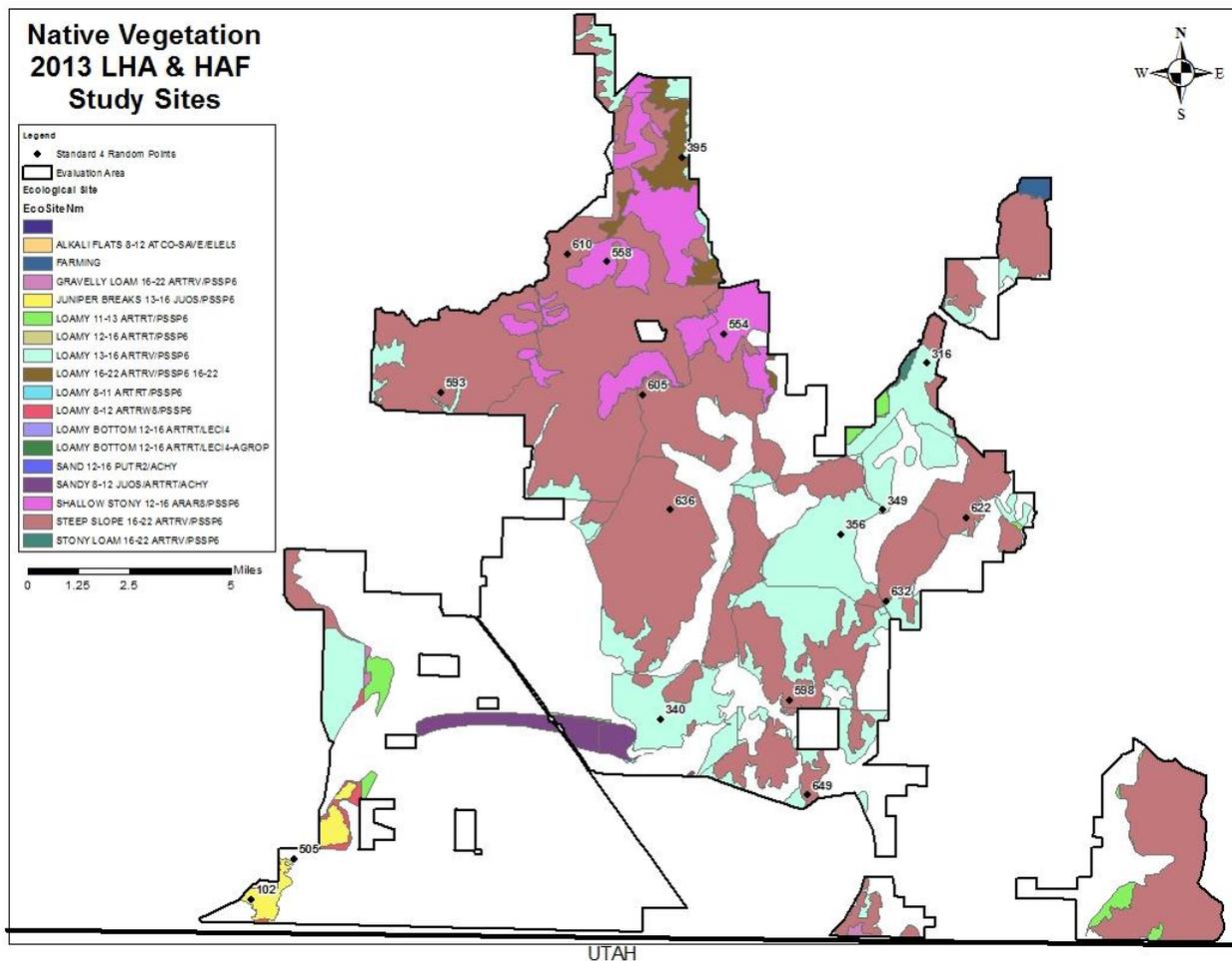
Native vegetation composes approximately 58% of the evaluation area. The majority of which has adequate species diversity and cover for proper ecological functioning condition. The native vegetation is found on six distinct ecological sites; Steep Slope 16-22 ARTRV/PSSP6, Shallow Stony 12-16 ARAR8/PSSP6, Loamy 16-22 ARTRV/PSSP6, Loamy 13-16 ARTRV/PSSP6, Loamy 8-12 ARTRW8/PSSP6, and Juniper Breaks 13-16 JUOS/PSSP6.

Prior to the fires of 2006-2007, large areas within the east central portion of the native vegetation experienced varying degrees of juniper encroachment. Based off isolated islands not burned during the 2006-2007 fires, it is expected that those areas with increased juniper cover (Type II and Type III juniper encroachment) had reduced shrub, forb and perennial bunchgrass cover.

The Steep Slope 16-22 ARTRV/PSSP6 ecological site makes up approximately 62% of the native sites. Approximately half of this site (the eastern portion of the evaluation area) has been affected by juniper encroachment either presently or in the recent past. At the 2012 HAF study site, bulbous bluegrass cover was 7.4% within the Steep Slope 16-22 ARTRV/PSSP6 ecological sites. This was also observed within the steeper slopes of the northern portion of the evaluation area. It is speculated that this area was seeded with Bulbous bluegrass at some point in the past as an erosion control measure but there is no documentation to support this claim. Bulbous bluegrass is a weak perennial and acts much like cheatgrass by filling in the interspaced between bunchgrasses and shrubs.

The Loamy 13-16 ARTRV/PSSP6 ecological site was also affected by encroaching junipers prior to the 2006-2007 fires. Following the fires the northern portion of this ecological site is recovering. It is suspected that the pulse in nutrients combined with decrease competition from the juniper over story lead to the increase in perennial grass canopy cover. However, the southern portion of the ecological site is recovering more slowly and has abundant cheatgrass cover, and bare ground. Sagebrush cover is reduced in both the northern and southern portions of this ecological site.

Figure 3.2: Map of Site ID locations for cover data within Native Vegetation collected in 2013 with the ecological sites depicted.



iv. Rangeland Seedings

Beginning in the late 1940s, the Bankhead-Jones lands located within the evaluation area were seeded to non-native bunchgrasses (Table 3.3), to stabilize soils and provide forage for livestock and wildlife. Some of these

seedings are now more than 60 years old. Later seedings took place through the 1980s to improve forage production, as well as to rehabilitate burned areas or to vegetate areas where shrub expansion was controlled.

Rangeland seedings, composed of crested wheatgrass (*Agropyron cristatum*) and other improved forage grasses, make up about 42% of the evaluation area. Some seedings are composed solely of crested wheatgrass, others are mixtures of grass species, a few forbs and native shrubs but do not provide quality habitat for wildlife even though they are over 20 plus years old. With time, seedings eventually become more diverse with the encroachment of native shrubs; however, the presence of forbs does not tend to increase.

Table 3.3: Seeding Species used in the Curlew allotment between 1952-1989.

| Plant species used in seedings on the Curlew allotment (1952 – 1989) | |
|---|--|
| Crested wheatgrass (<i>Agropyron cristatum</i> , <i>A. desertorum</i>) | Ryegrass (<i>Lolium perenne</i>) |
| | Alfalfa (<i>Medicago sativa</i> , <i>M. falcata</i>) |
| Intermediate wheatgrass (<i>A. intermedium</i>) | Bitterbrush (<i>Purshia tridentata</i>) |
| Pubescent wheatgrass (<i>A. trichophorum</i>) | Fourwing saltbush (<i>Atriplex canescens</i>) |
| Tall wheatgrass (<i>A. elongatum</i>) | Small Burnett (<i>Sanguisorba minor</i>) |
| Great Basin wildrye (<i>Elymus junceus</i>) | Yellow sweetclover (<i>Melilotus officinalis</i>) |
| Russian wildrye (<i>Psathyrostachys juncea</i>) | |

Current records indicate that the Black Pine Reseeding project planted 10,251 acres in 1951, the Stone area was seeded in 1954, the Van Koman and Wight areas in 1956, the Holbrook Burn area in 1958, the Roe area in 1959, the Mills area in 1961 and 1965, the Bowen and Grandine areas in 1963, the Cove, Cow Hollow and Stocker areas in 1965, the Holbrook area in 1969, the Bowhuis and Cove areas in 1973, the Haliday area in 1980, North Canyon in 1983 and the Trail Canyon, Badger Hole area in 1989

Some seedings have remained monocultures of crested wheatgrass while others have been recolonized by shrubs such as sagebrush and rabbitbrush at varying densities. Of those areas where shrubs recolonized the area, nearly 40% have been burned recently. Those which burned are now healthy monocultures of crested wheatgrass. None of the seeded areas contain a diverse or abundant forb population and native grasses do not appear to be reestablishing.

The majority of the seedings are vigorous with the exception occurring within the Alkali Flat 8-12 ATCO-SAVE/ELEL5 and the Loamy 8-11 ARTRT/PSSP6 ecological sites. Large expanses of halogeton and cheatgrass occur throughout these areas. In addition, based on cover transects, bare ground is greater than expected. This may be due to alkali soils, the low precipitation zone, the current stocking rate, or a combination of these factors. It is also unknown as to the success of the initial seeding within these sites. Records show that the areas were seeded and monitoring, including visual observations, have found seeded species throughout these poor sites, however currently seeded species densities are very low which tends to show that the initial seeding may not have been very successful. Native grasses (squirrel tail) have been found within historically seeded areas within the Alkali Flat ecological sites.

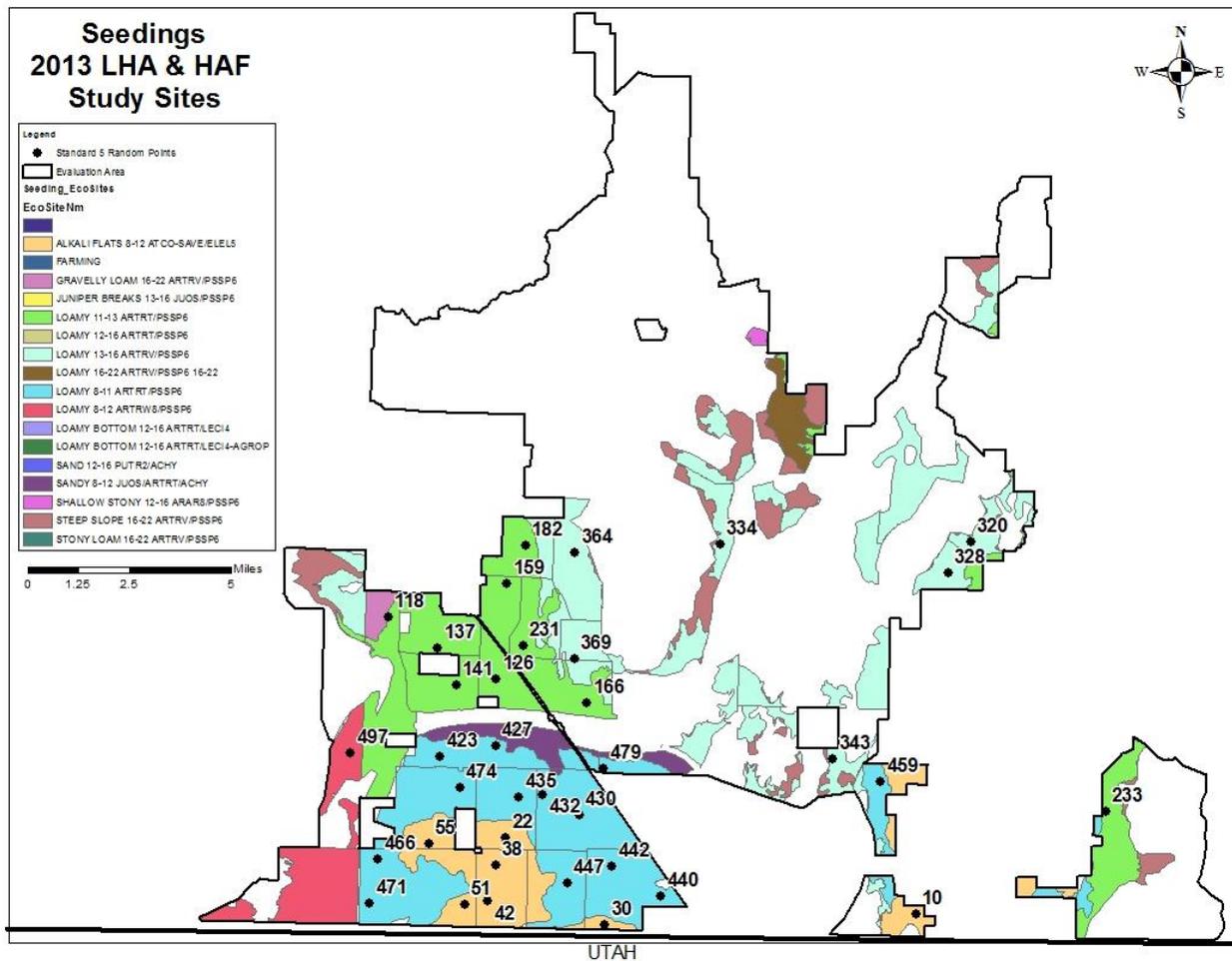
All of the Loamy 13-16 ATRRV/PSSP6 ecological sites that were sampled in 2012 were burned during the 2006/2007 fires resulting in sagebrush cover decreasing from 11% in 2000 to 0% in 2012. Forb cover increased from 3% in 2000 to 6.5% in 2012. This may have been caused by a pulse of nutrients and/or the decreased competition from woody species for a period of time following the wildfires.

Production studies conducted in 2014 found that within the seeded portion of the evaluation area production of perennial grasses ranged from 0 lbs/acre within portions of the alkali ecological sites to 974 lbs/acre within

more loamy sites. The loamy sites appear to be within the expected range of variation based on a study of the longevity of crested wheatgrass conducted within Oneida County between 1940 and 1964. During the 1964 study production data was collected yearly between 1940 and 1964 and the air-dry crested wheatgrass herbage yield in lbs/acre were reported. On average, crested wheatgrass production was 1,003 pounds per acre but ranged between 310 lbs/ac. and 1,590 lbs/ac within a silt loam soil type and a 9 to 14 inch precipitation zone (Hull and Klomp 1966).

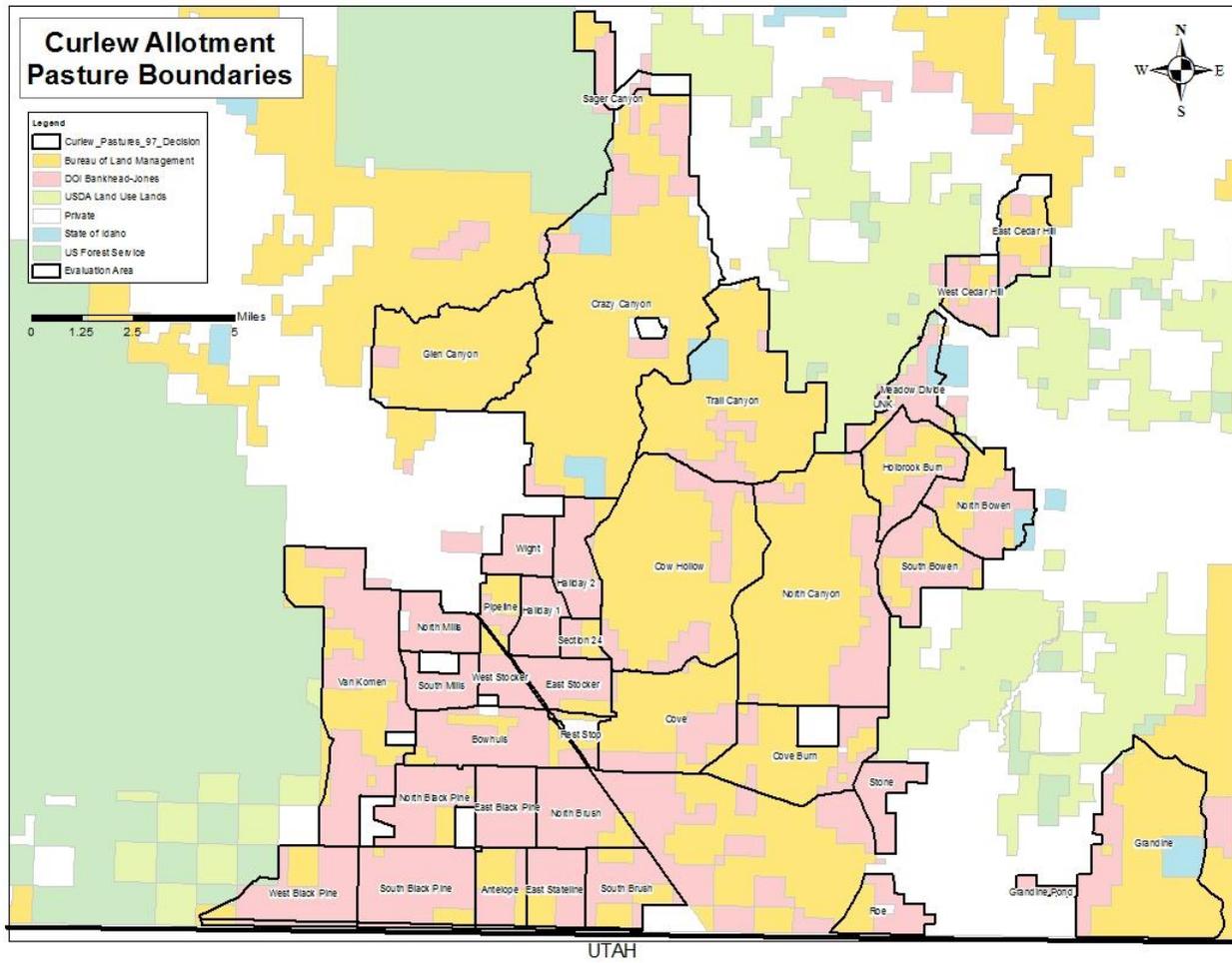
Cover percentages and comparisons of vegetation within the above and below sections is based off cover studies collected at the time of the 2000, 2011 and 2012 HAF studies and 2013 HAF (Sage Grouse Habitat Assessment Framework)/LHA (Land Health Assessment) studies. This information is summarized in Appendix F: Cover Studies.

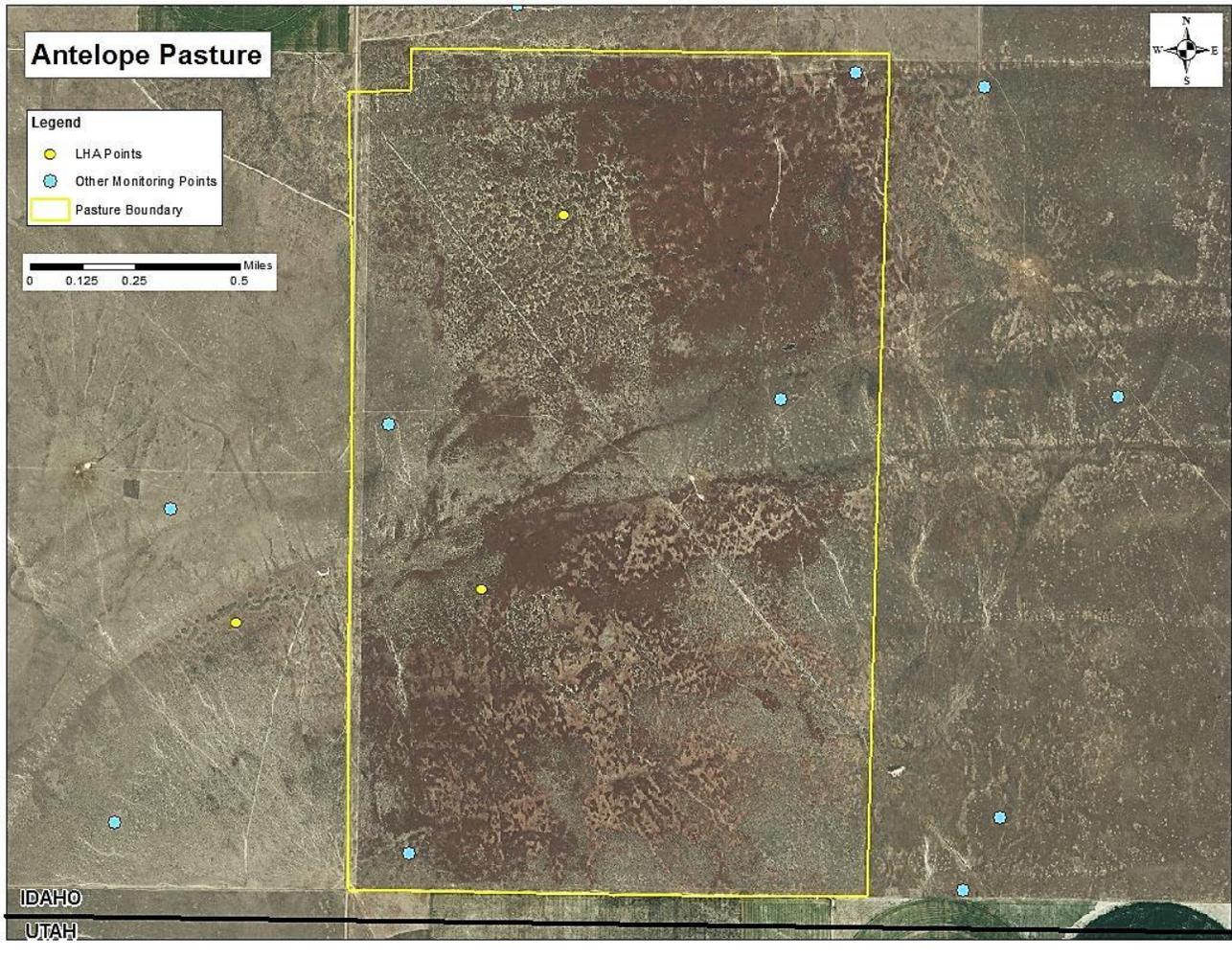
Figure 3.3: Map of Site ID locations for cover data within Seedings collected in 2013 with Ecological Sites depicted.



v. Detailed Pasture Descriptions

Figure 3.4: Pasture boundaries within the Curlew Allotment.





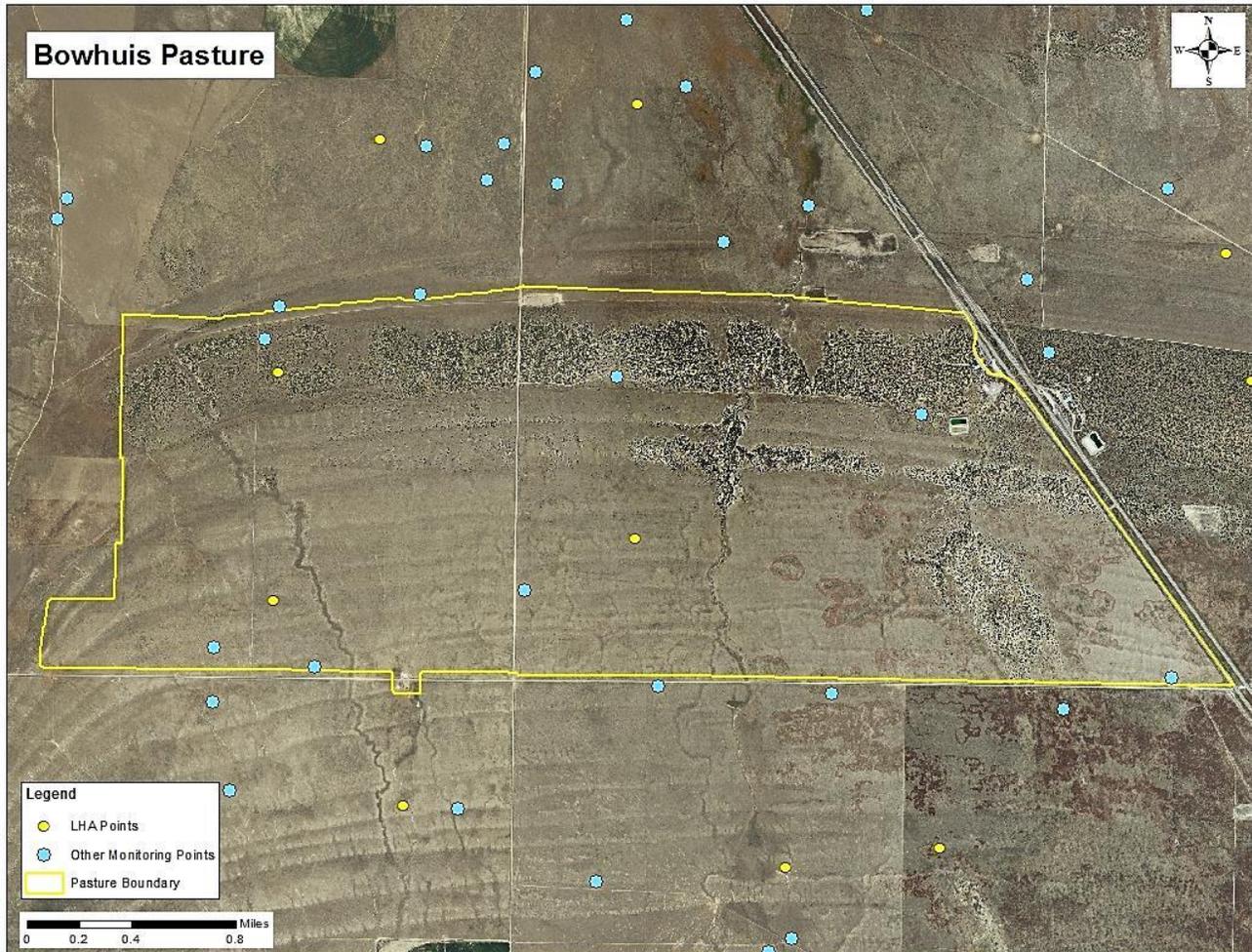
Antelope Pasture (1,561 acres):

Antelope pasture is considered a crested wheatgrass seeding that was planted on an Alkali Flats 8-12 ATCO-SAVE/ELEL5 ecological site. However, the seeded species (crested wheatgrass) is absent or greatly reduced on the majority of the pasture. An established stand of crested wheatgrass does occur across the center of the pasture. Based on utilization photos and observations these plants appear to be vigorous. The 2012 HAF surveys were conducted within an established crested wheatgrass site and found that canopy cover for the seeded species can be as high as 62%.

Within the pasture several large areas which are largely devoid of shrubs and perennial grasses occur. These areas are typically covered in either monocultures of cheatgrass or halogeton. In 2013, two sites were evaluated during the Land Health Evaluations. Both sites were located within areas with little crested wheatgrass canopy cover and abundant greasewood. The LHA found that one site was at a moderate departure from what would be expected for Indicator 12; Functional/Structural groups while the other was at a moderate to extreme departure. This indicator assesses suites of species that are grouped together on an ecological site basis and relates to a change in the type of plants for a given site. For this pasture the shift has been a decrease in bunchgrasses and an increase in annual grasses. The average crested wheatgrass canopy cover was 0.5% while the average cheatgrass canopy cover was 10%. Some remnant squirrel tail (*Elymus elymoides*) was observed. In addition, the average weedy species canopy cover was 15% and consisted of bur buttercup (*Ranunculus testiculatus*), clasping pepperweed (*Lepidium perfoliatum*), and pennycress (*Thlaspi arvense*). Greasewood dominates the shrub component.

In 2014, production studies were conducted. Within the areas dominated by greasewood and annual invasives, production of perennial grasses averaged just over half a pound per acre. Within the few isolated islands of established crested wheatgrass, production of perennial grasses averaged approximately 535 pounds per acre.

Though some areas of productive crested wheatgrass persist within the pasture, perennial grasses (both native and crested wheatgrass) are largely absent. Perennial species have been replaced by annual species such as bur buttercup, pennycress, halogeton and cheatgrass throughout the pasture and greasewood dominates the shrubby species.



Bowhuis Pasture (3,455 acres):

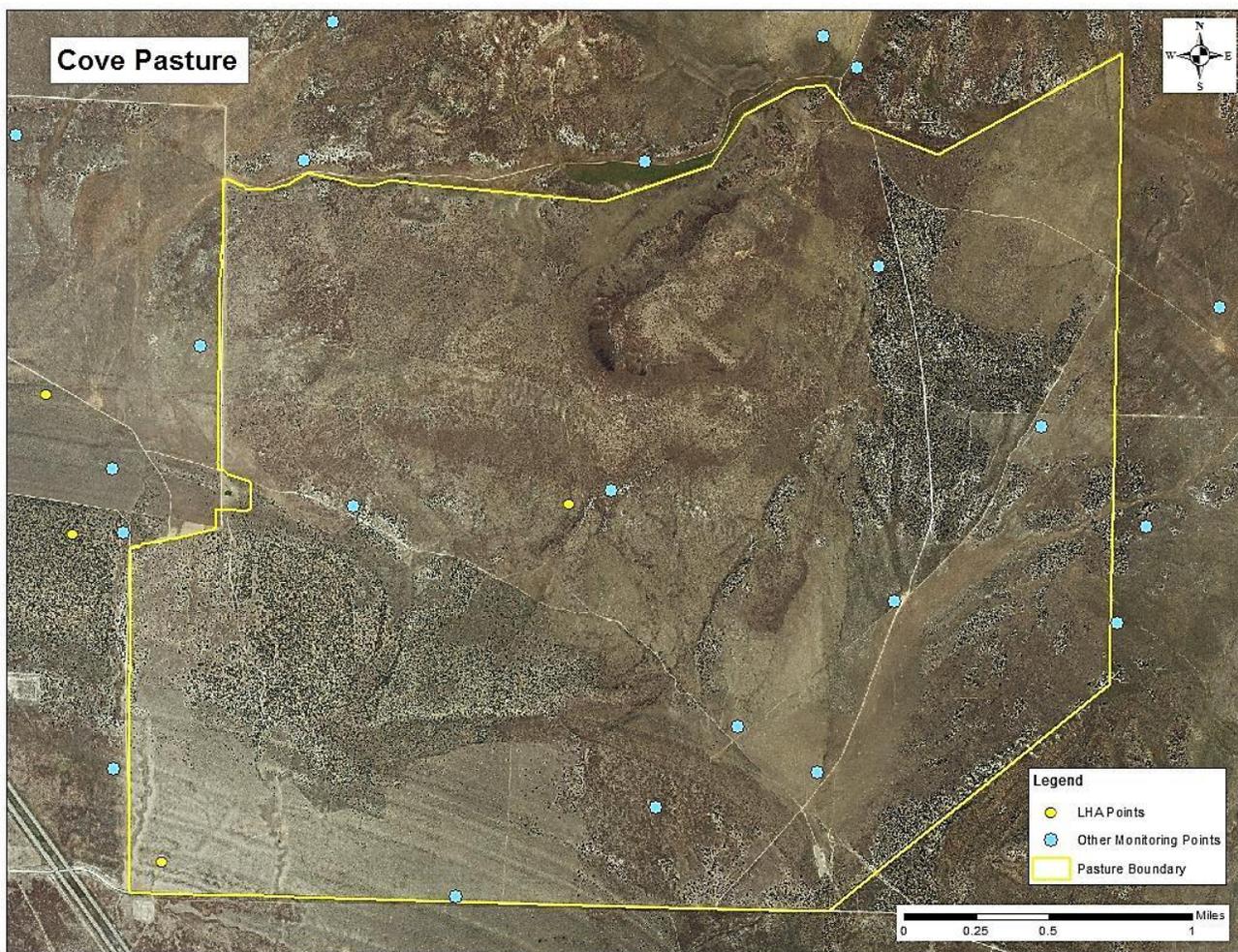
The majority of the Bowhuis Pasture was and continues to be a seeding, however the northern portion contains a native Juniper Belt associated with the ancient shoreline of Lake Bonneville.

Native Vegetation: The presence of juniper associated with a sandy soil is unique since it is typically associated with shallow rock outcrops. A specific ecological site description could not be found to compare the condition of this area to. Assessment information shows that there are a number of native grasses, forbs and crust formation within the Juniper Belt. During the 2013 LHA/HAF sampling perennial grasses contributed 4% of the canopy cover, sagebrush, 13% and microbiotic crust contributed 10%. The ID team conducting the assessment felt that the native herbaceous species present is consistent with what should be on the site.

Seeding: Within the seeded portion of the pasture there are bare areas that may be associated with minor inclusions of alkali soils. HAF studies conducted in 2013 concluded that the Biotic Integrity of the sites is at

slight to moderate deviation from what would be expected. The average crested wheatgrass canopy cover was 30% with few to no perennial forbs or weedy herbaceous species. Sagebrush canopy cover averaged 6%, however, sagebrush canopy cover is higher on the west side of the 36000 W road (10% canopy cover) compared to the east side of the 36000 W road (2% canopy cover). The Land Health Assessment team noted that the perennial vegetation is generally vigorous and healthy though some of the older crested wheatgrass were dying in the middle (active growth only occurring on the outer ring). In addition, it appears that the crested wheatgrass plants on the west side of the 36000 W road have a smaller basal area than in other portions of the pasture (LHA photos, observations). In 2014, production studies were conducted. The average production for the seeding was 546 pounds per acre.

In general the seeding is productive. Crested wheatgrass plants are healthy and vigorous. Sagebrush is recolonizing the entire pasture however it appears to be doing so at a faster rate on the west side of the 36000W road.



Cove Pasture (5,201 acres): The Cove Pasture is comprised of both native vegetation and seedings.

Native Vegetation: The southwest portion of this pasture may be included in the Juniper Belt associated with the ancient shoreline of Lake Bonneville. Juniper stands also dominated the Steep Slope 16-22 ARTRV/PSSP6 and Loamy 13-16 ARTRV/PSSP6 ecological sites. Large portions of these ecological sites were encroached by junipers prior to the 2006/2007 fires. Based off the current understory of those juniper stands that were not

burned it is believed that prior to the fires native shrub and herbaceous vegetation cover was reduced. This was probably the result of the increased juniper distribution and density.

Fires in 2006/2007 significantly reduced the proportion of live junipers within the native vegetation areas; however, some large pockets of live junipers remain. LHA and HAF studies were conducted within the burnt portion of the native vegetation in 2013 and found that the biotic integrity of the site is moderately departed from what would be expected. At the study site no shrubs were encountered in either the line intercept or the point intercept studies. Sagebrush and green rabbitbrush were noted in the species list from the surrounding area, but the amount of sagebrush seedlings was not as high as would be expected 6-7 years post fire. This may be a function of the size of the fires and the resulting loss of a nearby seed source. Based on monitoring records the understory of the burnt juniper stands consist of Indian ricegrass (*Oryzopsis hymenoides*), needle grass species and thickspike wheatgrass (*Elymus lanceolatus* var. *lanceolatus*). Data shows that bunchgrasses appear to be healthy but are not as abundant as would be expected for a Loamy ecological site. A rhizomatous grass, thickspike wheatgrass, was encountered at a higher rate than bunchgrasses during the 2013 studies leading to a moderate departure rating for Indicator 12, Functional/Structural groups. The Land Health Assessment also rated Indicator 16, Invasive plants as a moderate departure due to the frequency of cheatgrass within the native portions of the pasture.

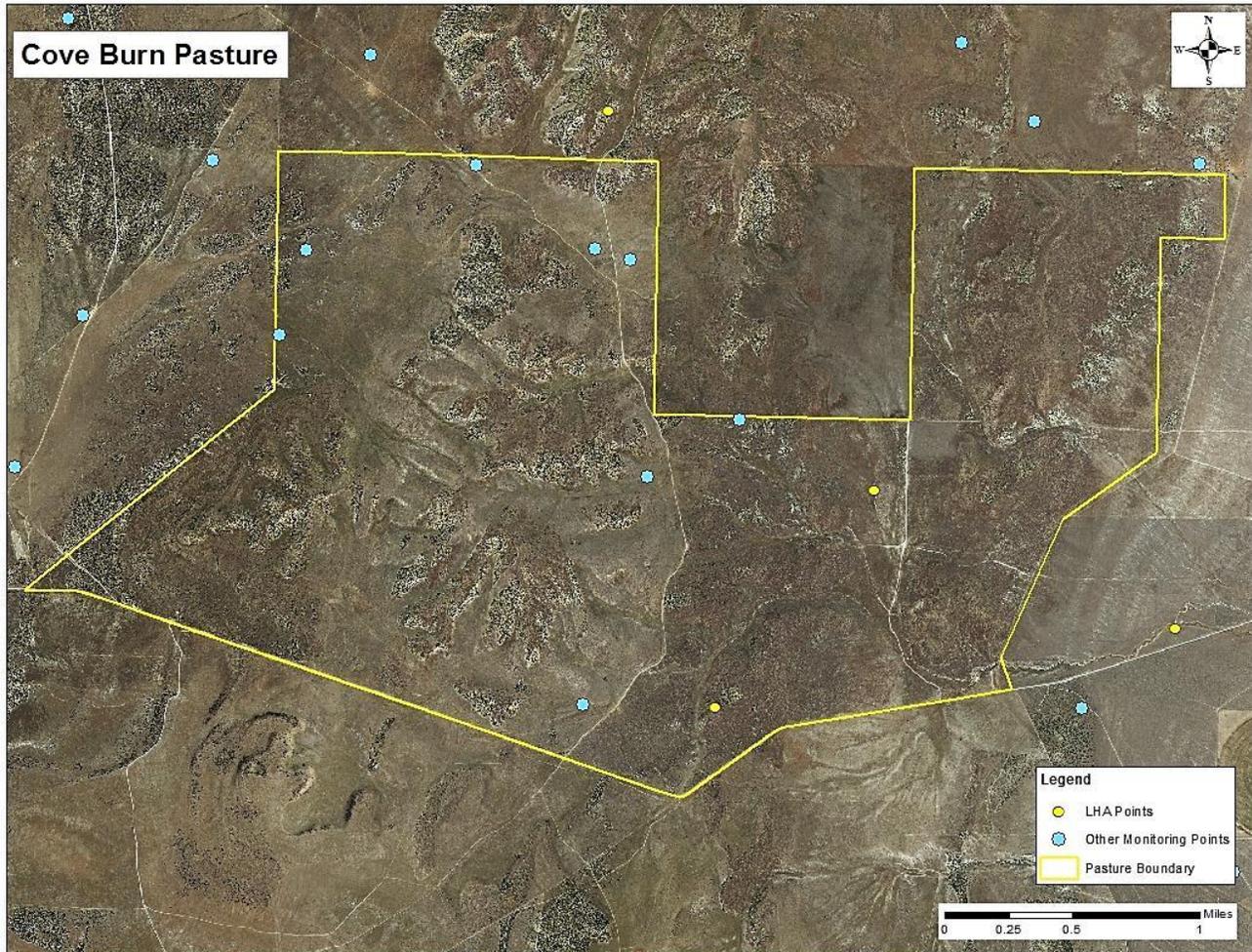
The unburnt pockets of junipers exist on the Loamy 13-16 ARTRV/PSSP6 ecological site which is supposed to be dominated by bluebunch wheatgrass and sagebrush. These unburnt islands have an understory consisting of bluebunch wheatgrass, Indian wheatgrass, needle grass species, and some remnant sagebrush (observations). Removal of the juniper would decrease competition for the remaining bunchgrasses and sagebrush and would improve the potential for a healthy sagebrush community. If treated, this area could function as a more readily available sagebrush seed source.

Though some areas with healthy bunch grasses are present within the native vegetation, for the majority of the native portion of the pasture, there are large areas where perennial bunch grasses seem to be replaced by thickspike wheatgrass. In addition, the level of cheatgrass found throughout exceeds what would be expected for a healthy site and may be at a tipping point should another large scale fire occur.

Seeding: The seedings are located primarily in the flatter valley bottom outside the juniper stands. A large portion of the pasture was burned during the 2006/2007 fires thereby creating burned and unburned seeded areas. Prior to the fires, the seedings in the central part of the pasture had an abundant sagebrush canopy cover (22% in 2000) but following the fires, the sagebrush cover is just 3% with other shrubs adding another 8%. The crested wheatgrass within the burned area consist of a vast expanse of large robust plants (Utilization photos).

The southwest corner of the pasture was not affected by the fires of 2006/2007. A Land Health Assessment was conducted within this section of the pasture in 2013 and found that the Biotic Integrity of the site is moderately departed from what would be expected due to moderate departures in Functional/Structural groups, Plant mortality and decadence, Annual production, and Invasive plants. Sagebrush canopy cover is low within this area (1% cover) but the canopy cover of other shrub species is 16%. The LHA study found that the crested wheatgrass production is less than expected and the plants do not exhibit vigor. As in the native portion of the pasture, the level of cheatgrass exceeds what would be expected for a healthy site and may be at a tipping point should another large scale fire occur.

The majority of the seedings were affected by the fires of 2006/2007 and have responded favorably with healthy crested wheatgrass plants and few invasive species. Only the southwest portion of the seeding lacks vigorous crested wheatgrass and possesses an excessive amount of cheatgrass

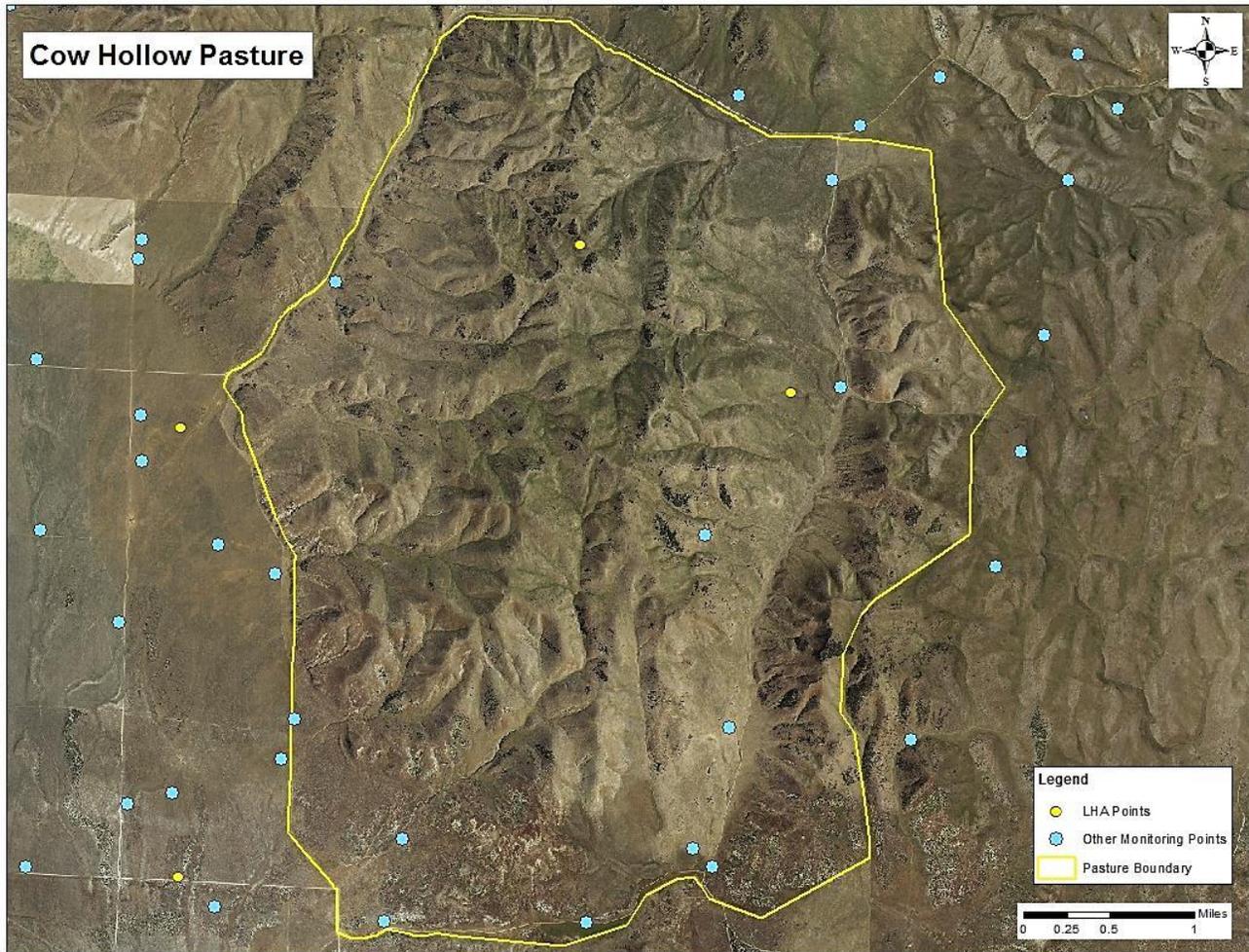


Cove Burn Pasture (4,340 acres): The Cove Burn Pasture is comprised of both native vegetation and seedings. The native vegetation is associated predominately with juniper stands and on the slopes and ridges of the hills while the seedings occur predominately on the flatter valley bottoms. LHA studies conducted in 2013 concluded that the Biotic Integrity at sample sites in both the native and the seeded portions of the pasture were moderately departed from what would be expected. Both sites had a rating of moderate to extreme departure for indicators 12 and 16, Functional Structural Groups and Invasive Plants respectively, and a rating of moderate departure for indicators 14, 15, and 17, Litter amount, Annual Production, and Reproductive Capability of Perennial Plants respectively (Appendix A).

Native Vegetation: A majority of the juniper stands were burned during the 2006 fires. The pasture was subsequently aerially seeded with Basin Big Sagebrush (*Artemisia tridentata* ssp. *tridentata*); however this treatment was not successful. Prior to the fires in 2006 it is suspected that sagebrush and other shrub canopy cover was reduced based on current shrub cover within adjacent unburned juniper stands. This reduction in cover was probably the result of the increased juniper distribution and density. Following the fires the live juniper was reduced but the shrubs, especially sagebrush, have not recovered. During the 2013 Land Health Assessment no shrubs were encountered in either the line intercept or the point intercept studies and no shrub species were noted in the species list gathered from the surrounding area. This is less than what would be expected 6 to 7 years post fire. The LHA and HAF studies done in 2013 noted that cheatgrass is common throughout the native portion of the pasture, especially around the bases of junipers. The LHA also noted perennial bunch grasses are lacking within large patches. The entire native portion has lower than expected shrub (0%) and perennial forb (1%) and grass (16%) cover. According to the Loamy 13-16 ARTRV/PSSP6

ecological site description the percent composition by weight for shrubs should be between 10 and 20, perennial forb should be between 10 and 20 and perennial grasses should be between 60 and 80.

Seeding: The LHA conducted in 2013 found that crested wheatgrass canopy cover was lower than what would be expected and that the plants lacked vigor within the seedings that occur within the east half of the pasture. The assessment also noted that cheatgrass is common throughout those sites. No sagebrush was encountered during the HAF sampling, however scattered sagebrush are visible in photos taken at the time of the assessment. Green rabbitbrush is the predominate shrub on the site with a canopy cover of 16%. Rabbitbrush resprouts following fire and is usually one of the first shrub species to recolonize an area. The remaining seedings contain healthy crested wheatgrass plants and scattered sagebrush.



Cow Hollow Pasture (11,226 acres): The Cow Hollow Pasture is comprised of both native vegetation and seedings. The native vegetation is predominately associated with juniper stands and on the steep slopes and ridges of the hills while the seedings occur predominately on the flatter valley bottoms near roads. Between 2001 and 2007 four fires burned within the Cow Hollow pasture. The Cow Hollow fire burned the western half of the pasture in 2007 while the Juniper Fire burned the majority of the central part of the pasture in 2005.

Native Vegetation: The native vegetation was dominated by juniper prior to these fires. This area was seeded with mountain big sagebrush following both the Cow Hollow fire and the Juniper fire. Although the Cow Canyon seeding did not achieve objectives the Juniper Fire seeding seems to have improved sagebrush cover

within areas once dominated with junipers. Following the fires the vegetative component shows signs of recovery.

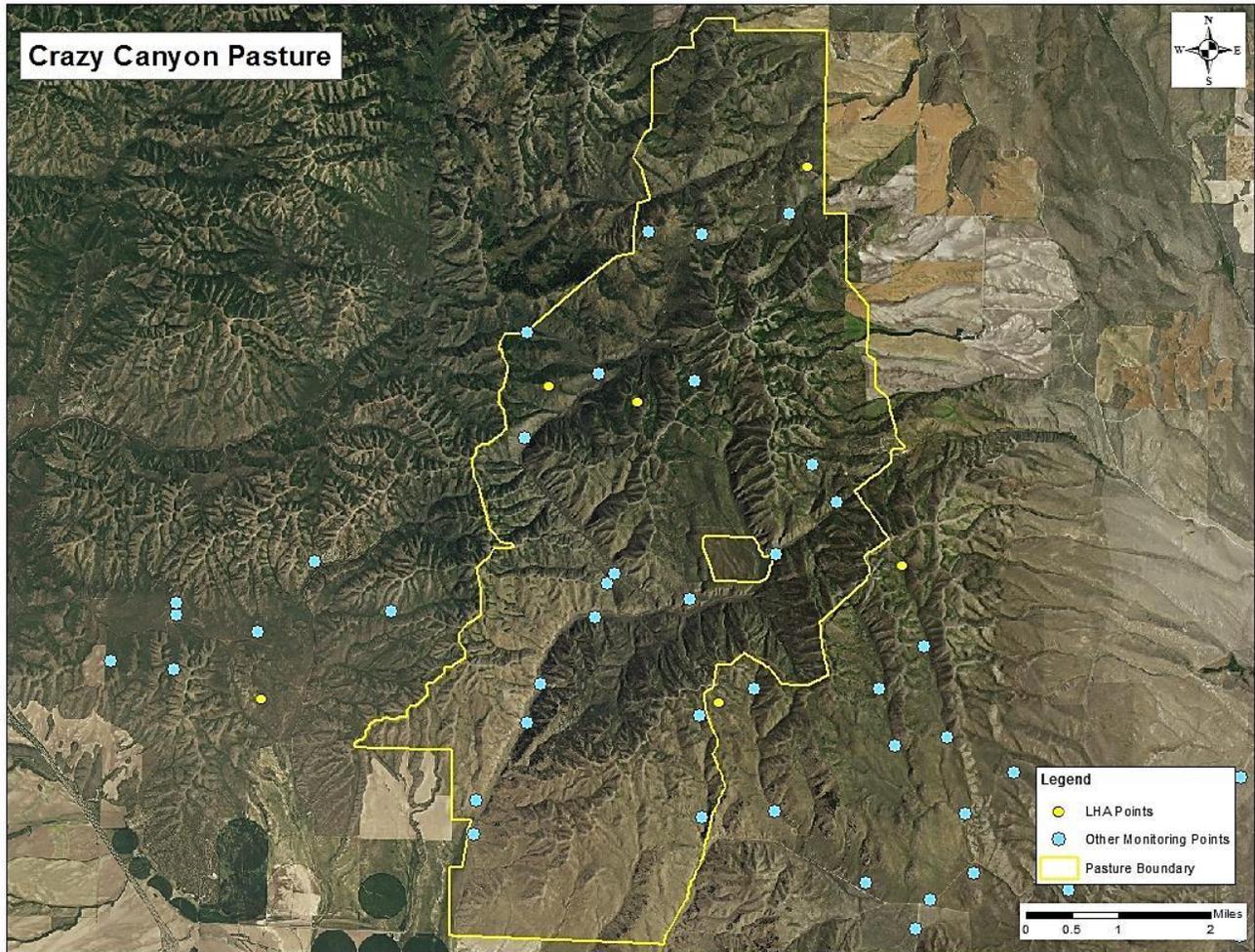
The 2013 LHA found a slight to moderate departure in Biotic Integrity; which was based primarily on the moderate to extreme departure rating concerning invasive plants. All other biotic indicators except soil stability were rated as either none to slight departure or slight to moderate departure from what would be expected. At the LHA site the shrub canopy cover is 16% and is composed of snowberry (*Synphorocarpus oreophilus*), service berry (*Amelanchier alnifolia*), sagebrush (*Artemisia* sp.), and snakeweed (*Gutierrezia sarothra*). The survey also noted the presence of bitterbrush (*Purshia tridentata*), green rabbitbrush (*Chrysothamnus viscidiflorus*), gray rabbitbrush (*Ericameria nauseosus*) and the presence of small juvenile junipers in the area. Several native bunchgrasses were recorded including bluebunch wheatgrass, Indian ricegrass, and Great Basin wildrye (29% cover) along with several native forb species (7% cover). This distribution of functional structural groups matches what would be expected for a Steep slope 16-22 ARTRV/PSSP6 ecological site. According to the ESD, invasive plant species should not be found within the site, however cheatgrass provides 7% of the canopy cover.

The presence of a diverse native community shows the resiliency and relative health of the native portion of the Cow Hollow pasture. Although cheatgrass is present and is of concern, the distribution and abundance of native perennial grasses on the site should prevent the site from converting to a monoculture of cheatgrass should another large scale fire occur.

Seeding: Nearly half the seedings within the pasture appear to be in poor condition. Based on utilization mapping and photos the seeded species, Intermediate wheatgrass (*Elymus hispidus*), is less vigorous and plants are producing at a level less than what would be expected within the southern half of the pasture.

In 2008, 20,000 Hobble Creek Sagebrush were planted by tractor within the seeded areas of the southern portion of the pasture. Permanent monitoring plots were not establish, therefore, the survival rate is unknown. However, there is mature sagebrush within the planting area as of 2014. In 2010 the Idaho Fish and Game planted 20,000 sagebrush seedlings with a tractor just west of the BLM 2008 planting. As of 2014, there was a 3% survival rate.

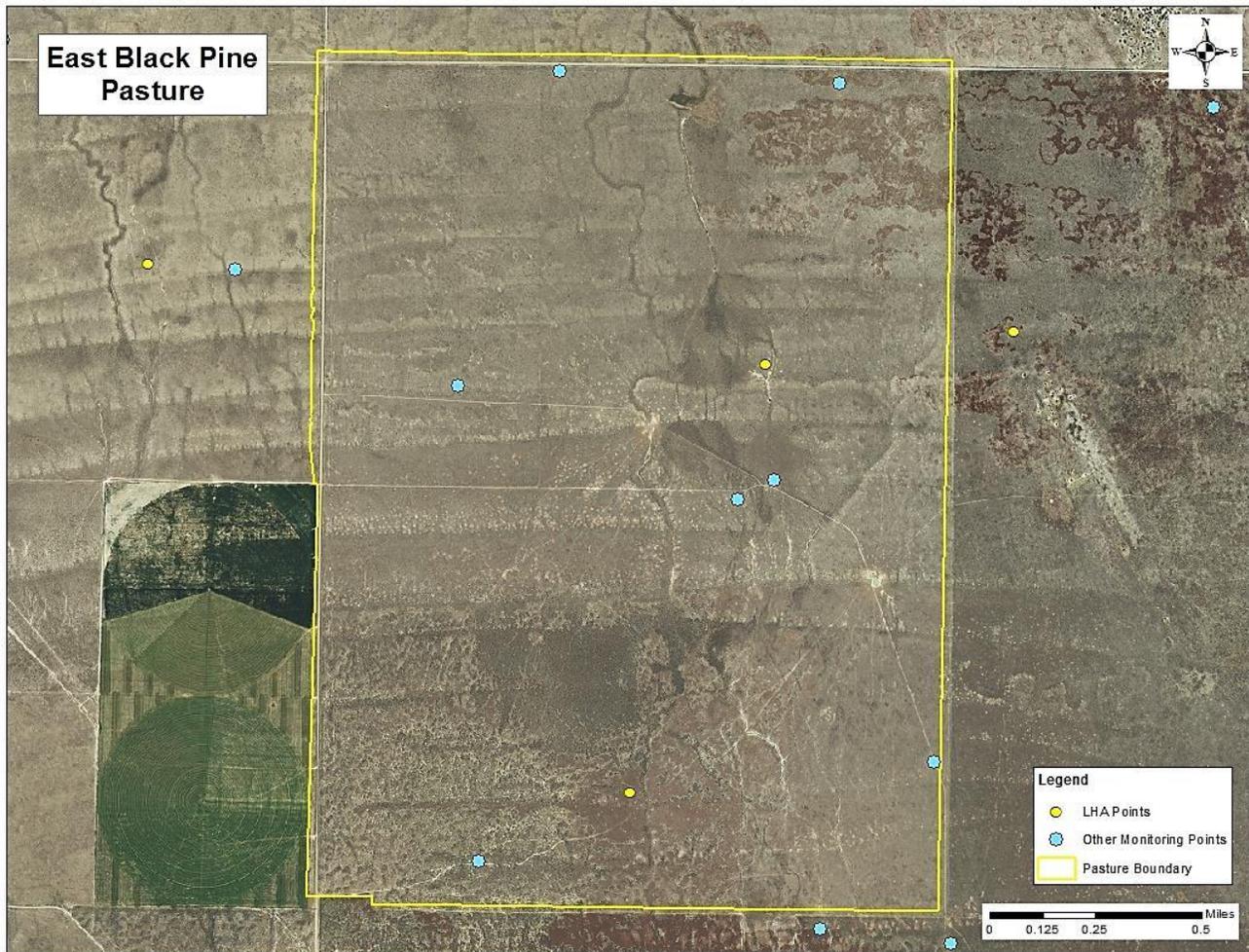
The northern half of the seeding appears to be in good condition. The Interdisciplinary team (ID team) rated the Biotic Integrity of the site as none to slight departure from what would be expected. The LHA and HAF studies found that bunchgrasses are plentiful, and vigorous. The seeded species, Intermediate wheatgrass (*Elymus hispidus*), has a canopy cover of 44%. Several forb species, sagebrush and other shrub species are also present within the northern portion of the seeding providing a diversity of species.



Crazy Canyon Pasture (19,871 acres): This pasture is comprised almost entirely of native vegetation. The pasture is characterized by steep hills with narrow valley bottoms. The bottoms consist of a mixture of native vegetation and crested wheatgrass seedings. Utilization mapping shows that the valley bottoms and road corridors are more heavily utilized than the surrounding hillsides. Photos of the area and notes from utilization studies show that bunchgrasses within the bottoms are less vigorous than those occurring on the surrounding hillsides and that weedy species are more concentrated.

The majority of the pasture is located within a Steep Slope 16-22 ARTRV/PSSP6 ecological site. The biotic integrity of the sites was never rated above slight to moderate departure. Study plots conducted in conjunction of the 2013 Land Health Assessment found that within this ecological site, the density and diversity of native grasses, perennial forbs, sagebrush and other mountain shrubs are adequate to maintain ecological processes. However, it did note that bulbous bluegrass was common throughout the site (19% within the transect). Bulbous bluegrass is a highly competitive species which reduces the establishment of other perennial grass species (Hull 1974). Therefore the high canopy cover of this species is concerning.

The southern portion of the pasture was burned during the Cow Canyon Fire of 2007. It burned both native vegetation and a crested wheatgrass seeding that exists within a bowl in the southwest corner of the pasture. Based off reconnaissance of the area in 2014, it was determined that the seeding is not as vigorous as would be expected.

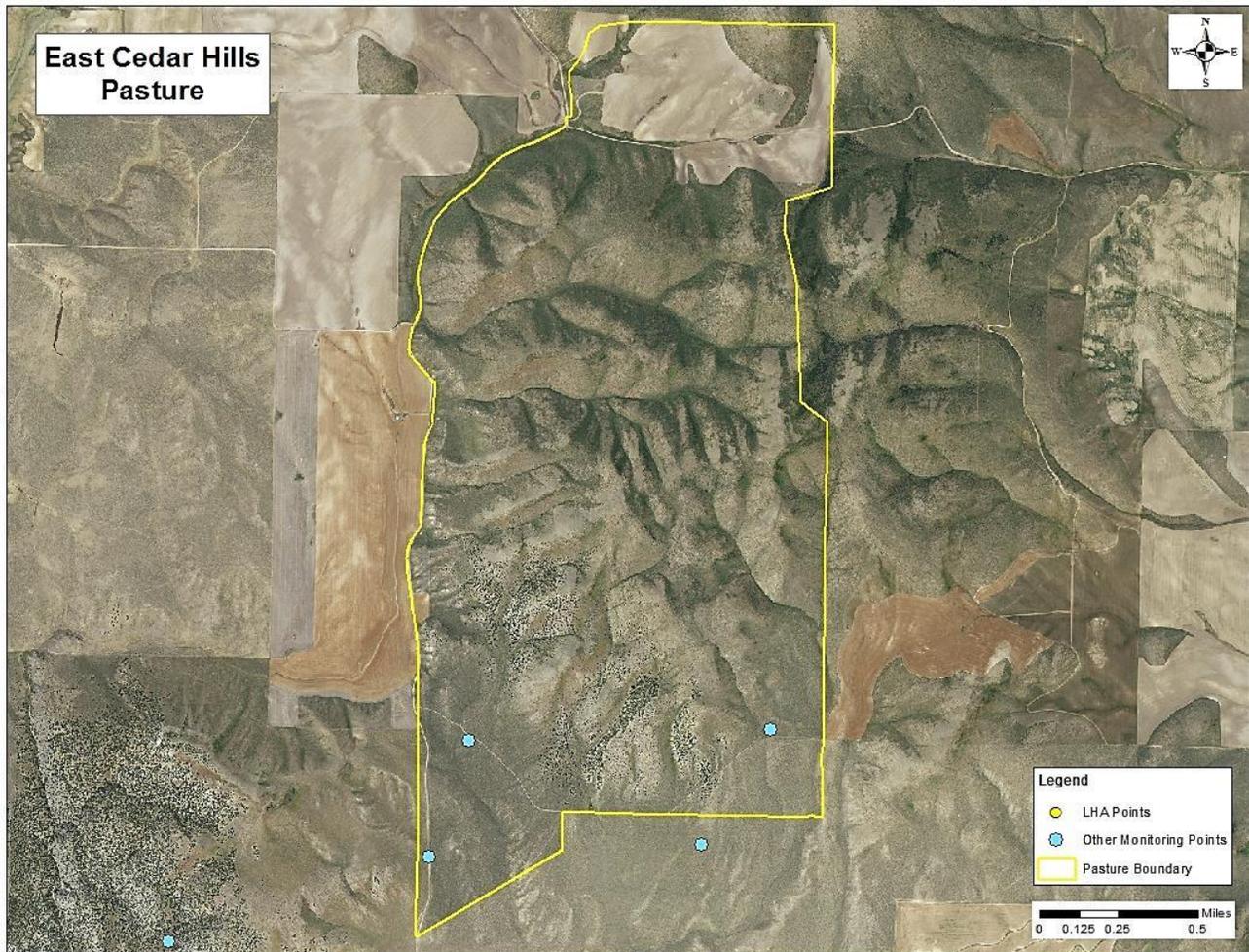


East Black Pine Pasture (1,928 acres): The East Black Pine Pasture is a seeding that was planted on two distinct ecological sites. The southern portion of the pasture is located on an Alkali Flat ecological site while the northern portion is located on a Loamy 8-11 ARTRT/PSSPS ecological site with alkali soil inclusions. LHA and HAF studies were conducted within both ecological sites.

At the time of the assessment it was not evident that the area within the Alkali Flat ecological site had been plowed or seeded to crested wheatgrass. The poor expression of seeded species could be because the area was not seeded with the rest of the pasture at the time of the original planting, the original planting did not establish within the site, or that the seeding deteriorated over time. The assessment found that the southern portion of the pasture is at a moderate to extreme departure from what would be expected for Biotic Integrity. Indicator 14, litter amount and indicator 17, reproductive capability of perennial plants were rated as moderate departure, indicator 12, functional/structural groups and indicator 16, invasive plants were rated as moderate to extreme departure and indicator 15, annual production was rated as extreme to total departure. Crested wheatgrass is severely lacking (0% canopy cover within transect) and cheatgrass and other weedy species compose 8% and 24% of the canopy cover respectively. This is similar to the results found within the Antelope pasture and exemplifies the difficulties of establishing grasses on alkali soils within a low precipitation zone. The assessment noted that the rare bunchgrasses that do occur on the site do so under sagebrush. Production studies conducted in 2014 encountered no perennial grasses within the Alkali portion of the pasture.

In contrast, the assessment found that the northern portion of the pasture (Loamy 8-11 ARTRT/PSSPS ecological site), consists of a vigorous crested wheatgrass seeding. Crested wheatgrass is abundant with a

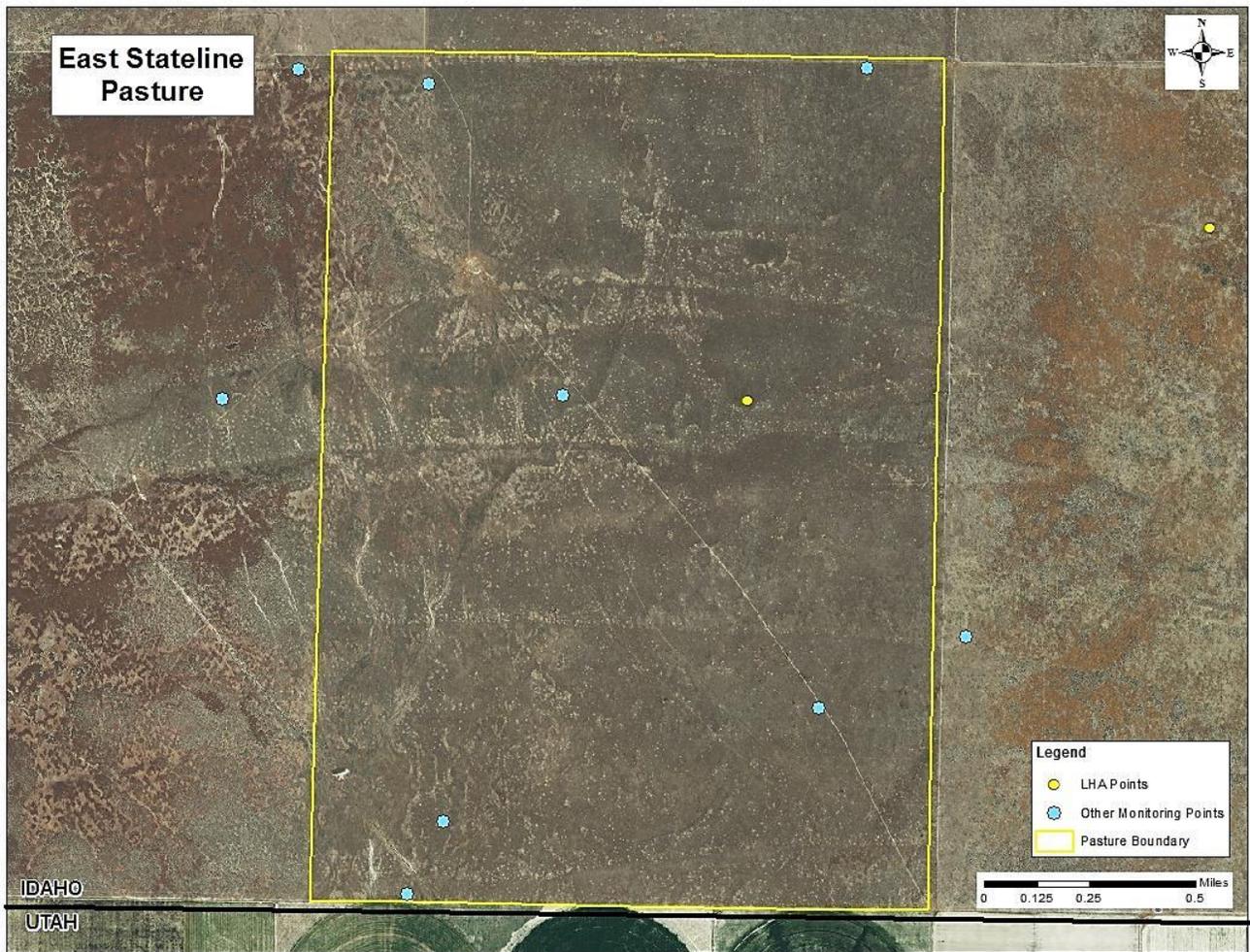
canopy cover of 28%, while cheatgrass and other weedy species were absent. Though crested wheatgrass canopy cover is adequate the LHA noted that some of the plants had dead centers but that the bases of the plants are larger than those found within the North Black Pine pasture. The assessment also notes that there are areas of dense sagebrush scattered throughout the northern portion of the pasture. These factors attributed to a slight to moderate departure rating for biotic integrity attribute for the Loamy 8-11 ESD site. Production studies within this portion of the pasture found an average of 365 pounds per acre of perennial grasses.



East Cedar Hills Pasture (1,940 acres): The majority of the East Cedar Hills Pasture consists of native vegetation. Some small pockets of crested wheatgrass exist along the southern boundary with the USFS managed land.

Native Vegetation: The native portion of the pasture is healthy, consisting of abundant perennial forbs, grasses and sagebrush. Some of the perennial grasses species occurring within the pasture include bluebunch wheatgrass, western wheatgrass, Indian ricegrass, needlegrass species, and Great Basin wildrye. Some biological crust formation is present within the native portions of the pasture. Invasive species are rare within the pasture. However, agricultural land at the northern end of the pasture may provide an available weedy plant seed source.

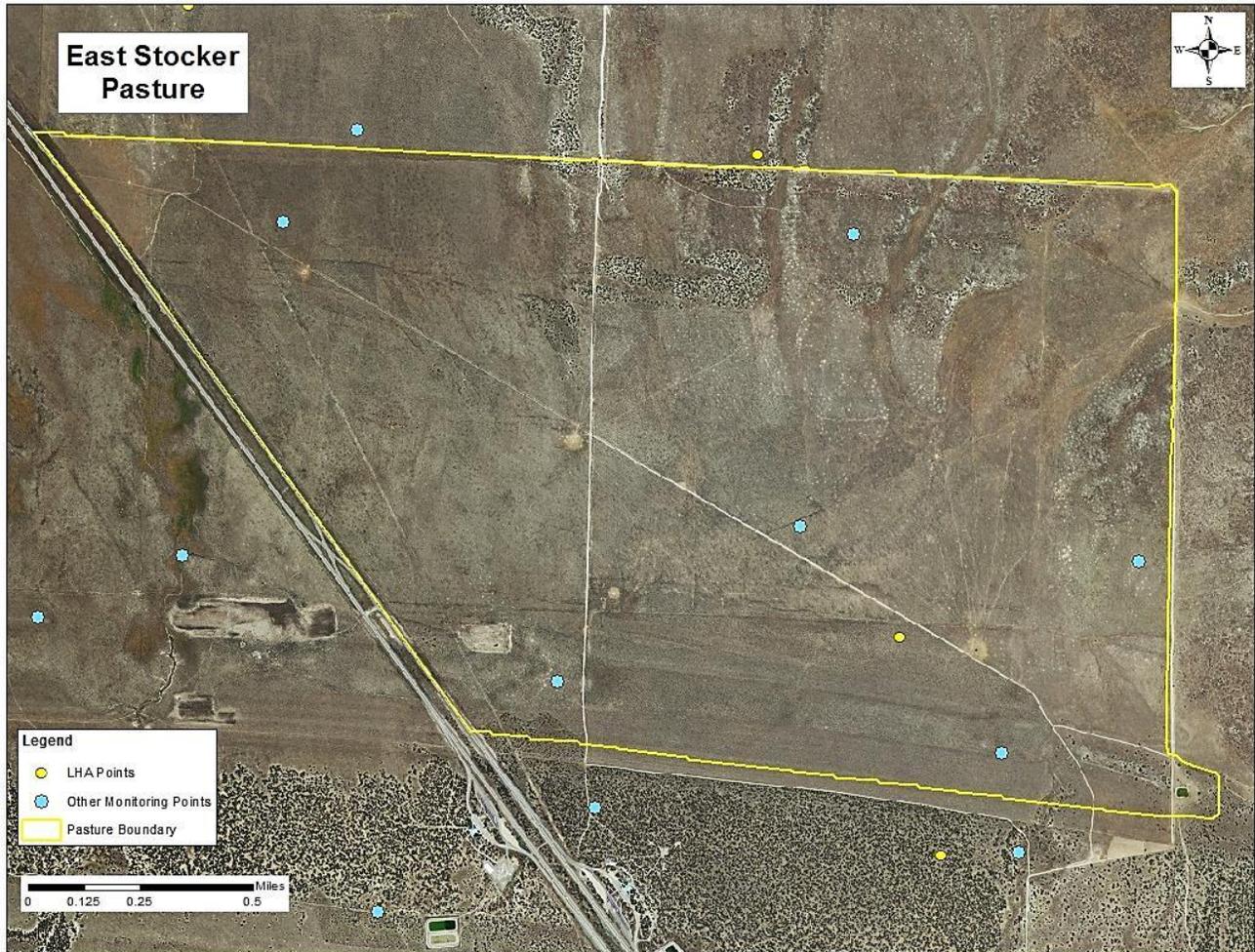
Seeding: The seeded portions of the pasture are in good condition with adequate crested wheatgrass cover and mature sagebrush. Bulbous bluegrass is present within the seeding and the amount of canopy cover found within the study plot (17%) is of concern due to its highly competitive nature.



East Stateline Pasture (1,803 acres):

The East Stateline Pasture is a seeding that was planted on two distinct ecological sites. The western most portion of the pasture (roughly 31%) is located on an Alkali Flat ecological site. The other portion is located on a Loamy 8-11 ARTRT/PSSPS ecological site with isolated alkali soil inclusions. Halogeton is found throughout the pasture within these inclusions and the Alkali Flat ecological site.

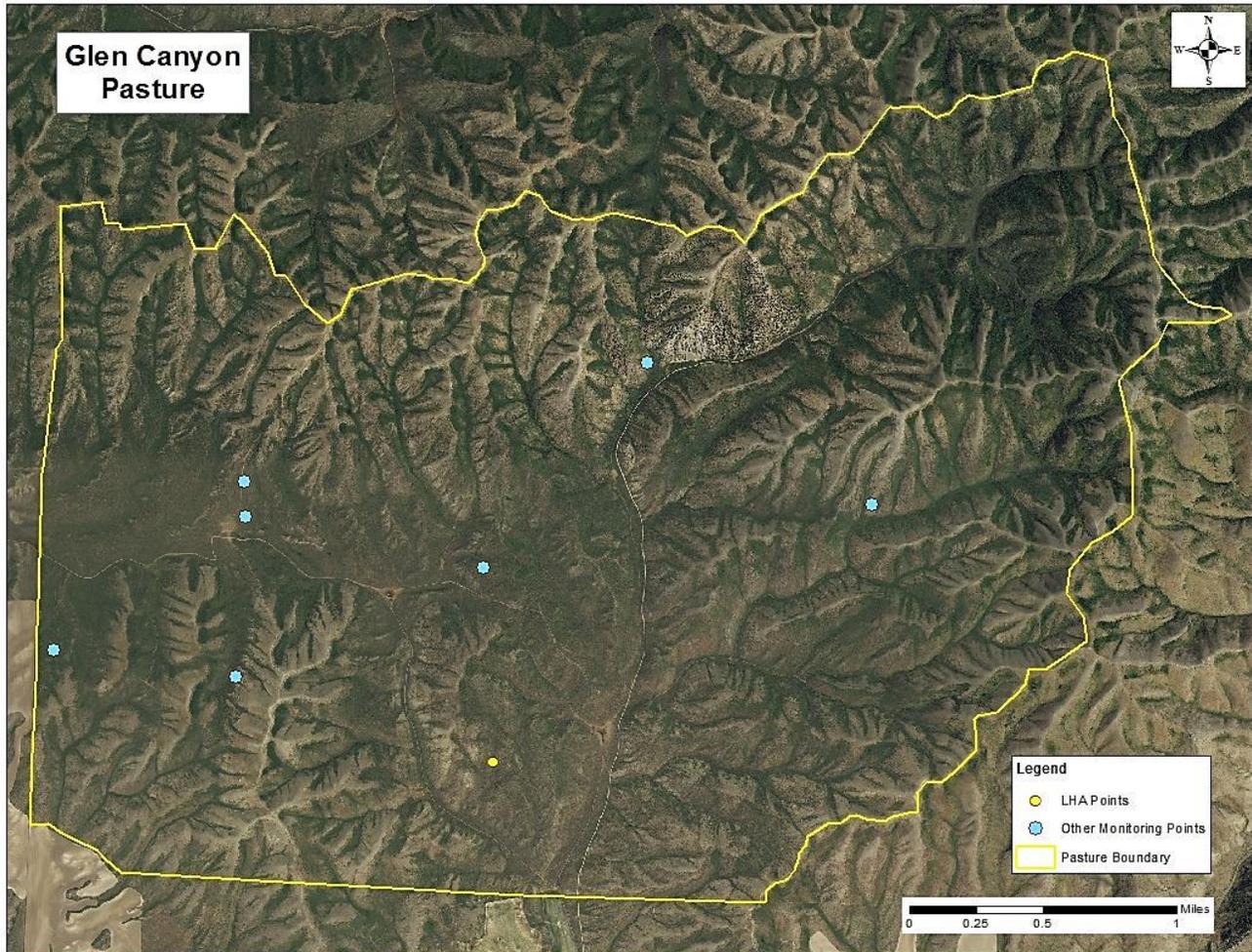
The portion of the seeding planted on the Alkali Flat ecological site is not as productive as would be expected in a vigorous crested wheatgrass seeding. Based on utilization photos, the seeded species is smaller in stature than expected and less vigorous. The portion of the seeding planted on the Loamy ecological site was assessed in 2013. Within this portion of the pasture the crested wheatgrass is in good condition and abundant (20% of the canopy cover). No forbs were encountered during sampling in 2013, but this is to be expected within a crested wheatgrass seeding. These factors attributed to a rating of slight to moderate departure for the biotic integrity attribute for the Loamy 8-11 ecological site. Numerous utilization photos support the LHA data that the seeding within the Loamy ecological site appears healthy and productive.



East Stocker Pasture (1,755 acres):

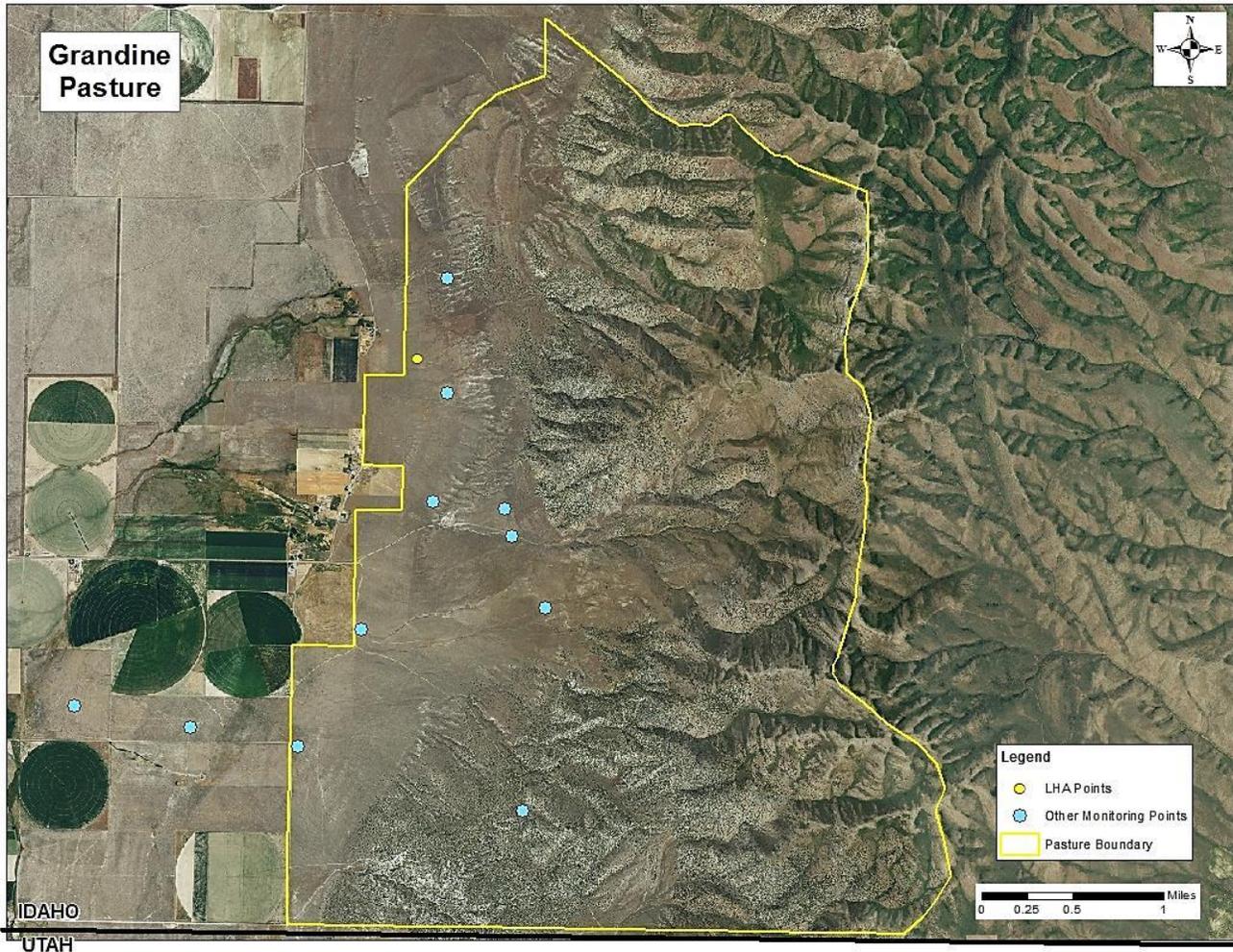
The East Stocker Pasture is a seeding. Two distinct vegetative communities exist within the seeding. The eastern portion of the pasture was burned during the fires of 2006/2007. Within the burnt portion of the pasture the seeding appears healthy with a crested wheatgrass canopy cover of around 35% with little sagebrush or other shrub canopy cover (Appendix F; Cover Studies 2000, 2011, 2012). Utilization photos from this portion of the pasture show abundant, vigorous plants.

Crested wheatgrass canopy cover is less within the unburnt portion of the pasture (17%) (Appendix F; Cover Studies 2013). These plants are rarely located within the interspaces of shrubs, which contribute as much as 15% canopy cover. Within this area the crested wheatgrass plants are less vigorous. As shrub cover continues to increase it is expected that grass cover will decline. It was noted during the site assessments that this portion of the seeding has the minimal requirement for a healthy seeding, but could be on a downward trend if grazing pressure increases or continues at the current rate and shrub cover increases.



Glen Canyon Pasture (6,258 acres): The Glen Canyon Pasture is characterized by steep hills with narrow valley bottoms. The bottoms consist of a mixture of native vegetation and crested wheatgrass seedings. All of the waters for this pasture occur within the bottoms along the road corridors. Consequently, utilization mapping shows that the valley bottoms and road corridors are utilized more than the surrounding hillsides. Photos of the area and notes from utilization studies show that bunchgrasses within the bottoms are less vigorous than those occurring on the surrounding hillsides and that weedy species are more concentrated.

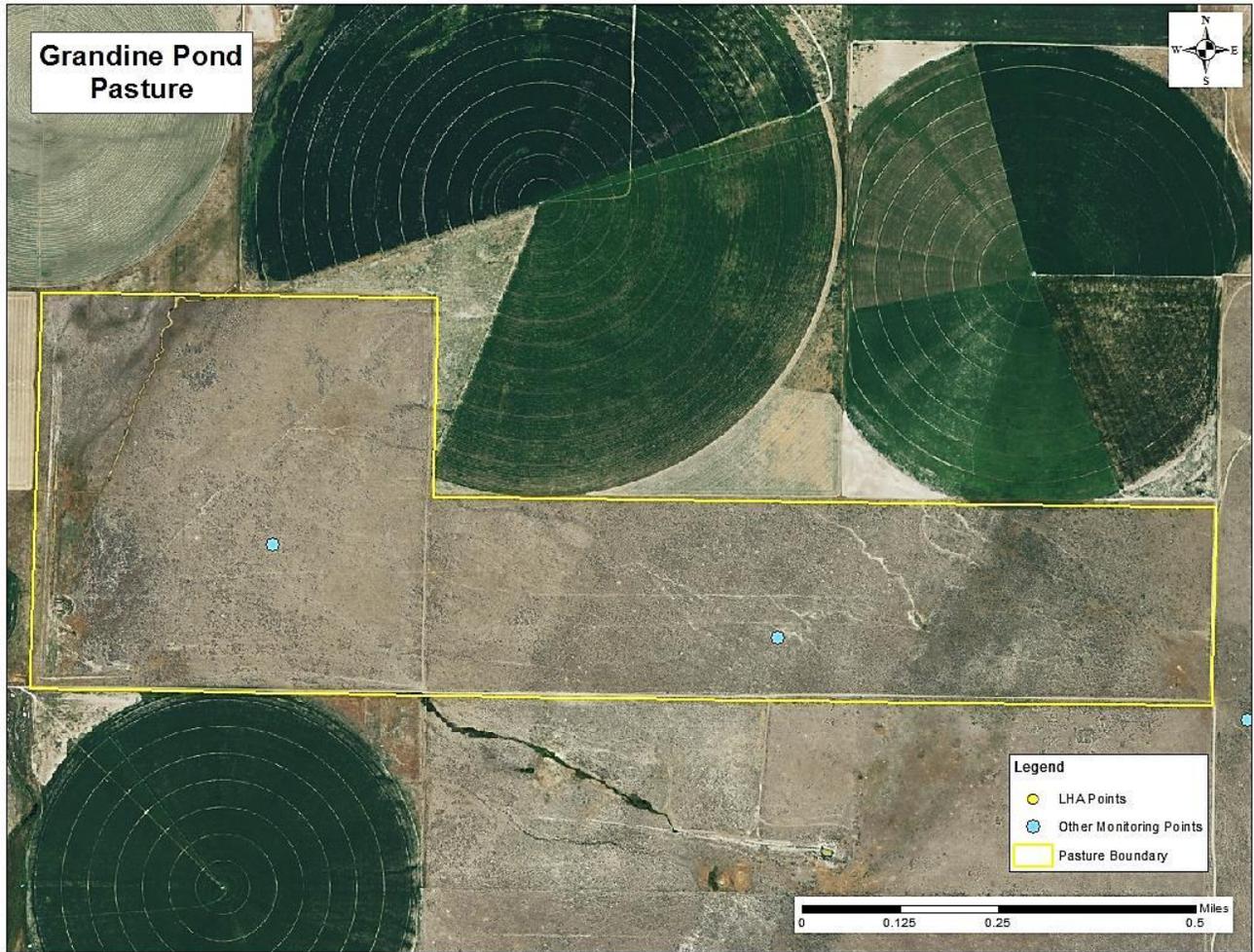
Native Vegetation: The native vegetation within the pasture as a whole is healthy. The LHA of 2013 rated the biotic integrity as slight to moderate departure from what would be expected, mainly due to the increase in invasive plants. The pasture has a relatively high shrub canopy cover (35%) but only 4% sagebrush canopy cover. This is what would be expected within a mountain shrub community. At the assessment site, Bulbous bluegrass had a 15% canopy cover, while native grass species had a total of 9%. The species composition and cover percent would vary across the pasture, however the presence of Bulbous bluegrass and its density within the native community is of concern due to its highly competitive nature that can reduce the establishment of other grass species (Hull 1974). Cheatgrass, Kentucky bluegrass, and hounds tongue (*Cynoglossum officinale*) are common throughout the pasture, especially within the valley bottoms and along travel routes. Although invasive species do occur within the pasture it is not believed that they would result in a monoculture following wildfires due to the abundance and diversity of native plant species. Their presence however remains a concern.



Grandine Pasture (8,344 acres): The Grandine Pasture is composed of both native vegetation and seedings.

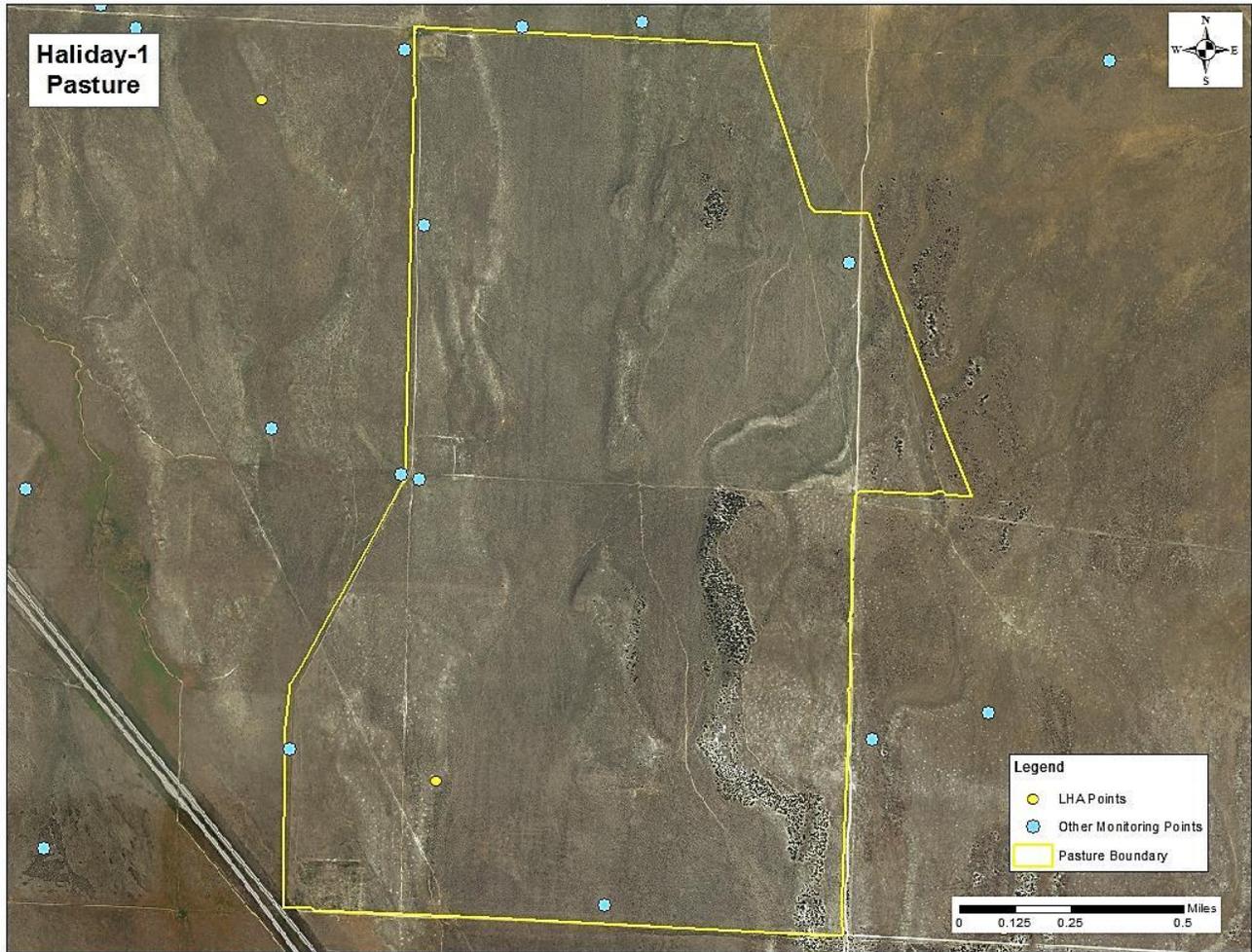
Native Vegetation: The native vegetation is found primarily where the topography increases in steepness and in association with juniper stands within the Steep Slope 16-22 ARTRV/PSSP6 ecological site. No cover studies and very few utilization studies have been conducted within the native vegetation. However, based on photos in which the hillside is visible, the few utilization studies conducted in the native vegetation, aerial photographs and field reconnaissance it appears that stage II juniper encroachment (junipers are co-dominant with sagebrush) is occurring on a majority of the hillside, with the exception of those areas affected by wildfires. Within those areas affected by wildfires the native bunchgrasses are large and healthy. Within the juniper encroachment area, areas of Stage I and early Stage II juniper encroachment exist where sagebrush and native grasses are still present and viable. Removal of the juniper within these areas would rejuvenate the native shrub and grass communities. Continued expansion of junipers is a threat to the remaining sagebrush and bunchgrasses found within the native vegetation. Areas of phase III juniper is present within the native area, however extensive studies and mapping would be required to determine its extent.

Seeding: The seeding is healthy and found predominately on the flatter valley bottom and benches. The crested plants are large, vigorous and have a canopy cover of approximately 20%. Sagebrush is scattered throughout the seeding with a higher concentration occurring in the northern portion of the pasture (22% cover; Appendix F: Cover 2013 vs 11% cover; Appendix F: Cover 2000, 2011, 2012). Utilization mapping indicates that the majority of the livestock use occurs within the seedings, with the highest utilization occurring near the watering troughs. The 2013 LHA rated the biotic integrity as none to slight departure.



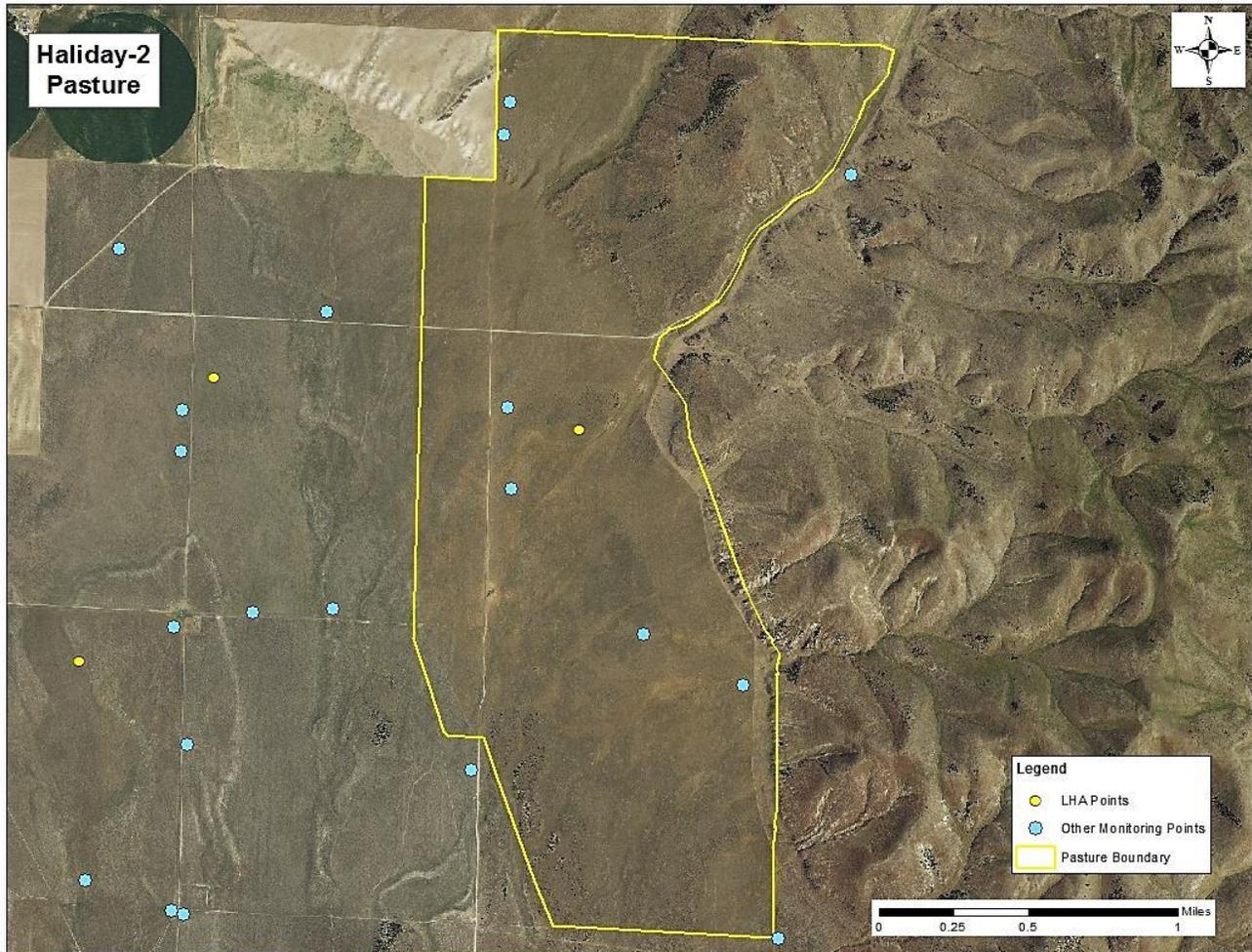
Grandine Pond Pasture (323 acres):

The Grandine Pond Pasture is a productive seeding. No cover studies or land health assessments were conducted in the Grandine Pond Pasture; however, several years of utilization photos show that mature sagebrush is abundant on the site along with the seeded species (crested wheatgrass). The crested wheatgrass plants occur in large bunches throughout the pasture.



Haliday-1 Pasture (1,407 acres):

The Haliday-1 Pasture is a vigorous seeding. Utilization photos along with the 2013 LHA studies show a well-established crested wheatgrass seeding with plants evenly distributed between the interspace and under shrubs. Sagebrush, both mature and seedlings are present throughout the pasture along with snakeweed. In 2013, the LHA found that the seeded species (crested wheatgrass) had 39% canopy cover, perennial forbs had 2% canopy cover, and that sagebrush and other shrubs each had 9% canopy cover. This is within the expected range of variation attributing to a none to slight departure rating for the biotic integrity attribute during the 2013 LHA studies.

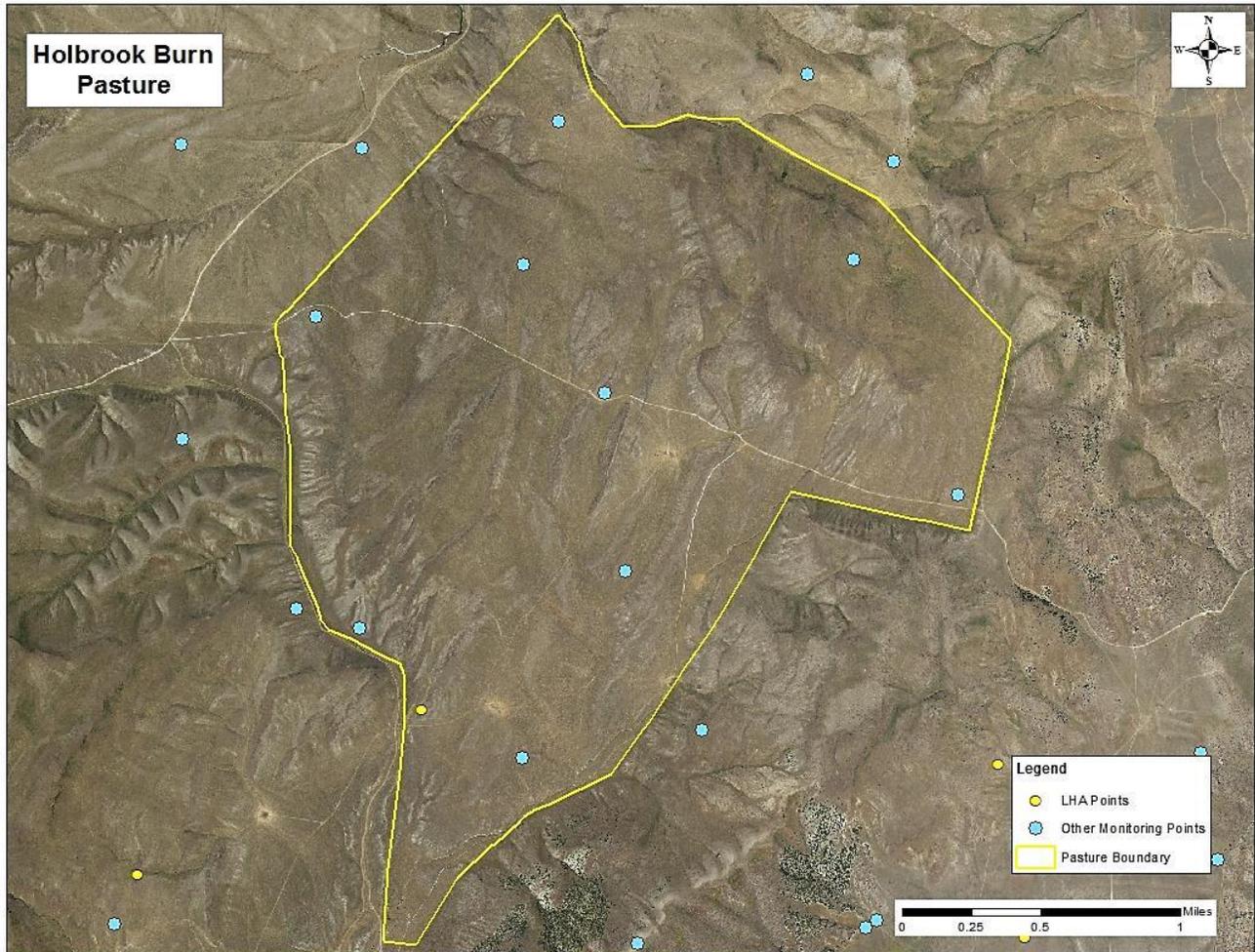


Haliday-2 Pasture (1,979 acres):

The Haliday-2 Pasture is a seeding. The entire pasture was burned during the fires of 2006/2007. Following the fires the majority of the pasture was seeded with mountain big sagebrush but the objectives for the treatment were not met. The southern portion of the pasture has had two separate tractor plantings of bare root sagebrush seedlings; one in 2012 (20,000 seedlings) and a follow up treatment in 2014 (5,000). Success of the 2012 planting is poor which is attributed to a lack of precipitation during the 2012 growing season. The 2014 treatment occurred within the same treatment footprint and results of this treatment are unknown at this time.

In 2009, 25,000 bare root sagebrush seedlings were planted with a tractor in the northwest portion of the pasture. The seedlings had been grown from seed collected locally by PFO personnel the previous year. In 2010, the treatment had a 62% survival rate which has decreased to 41% as of 2014. This planting continues to meet objectives.

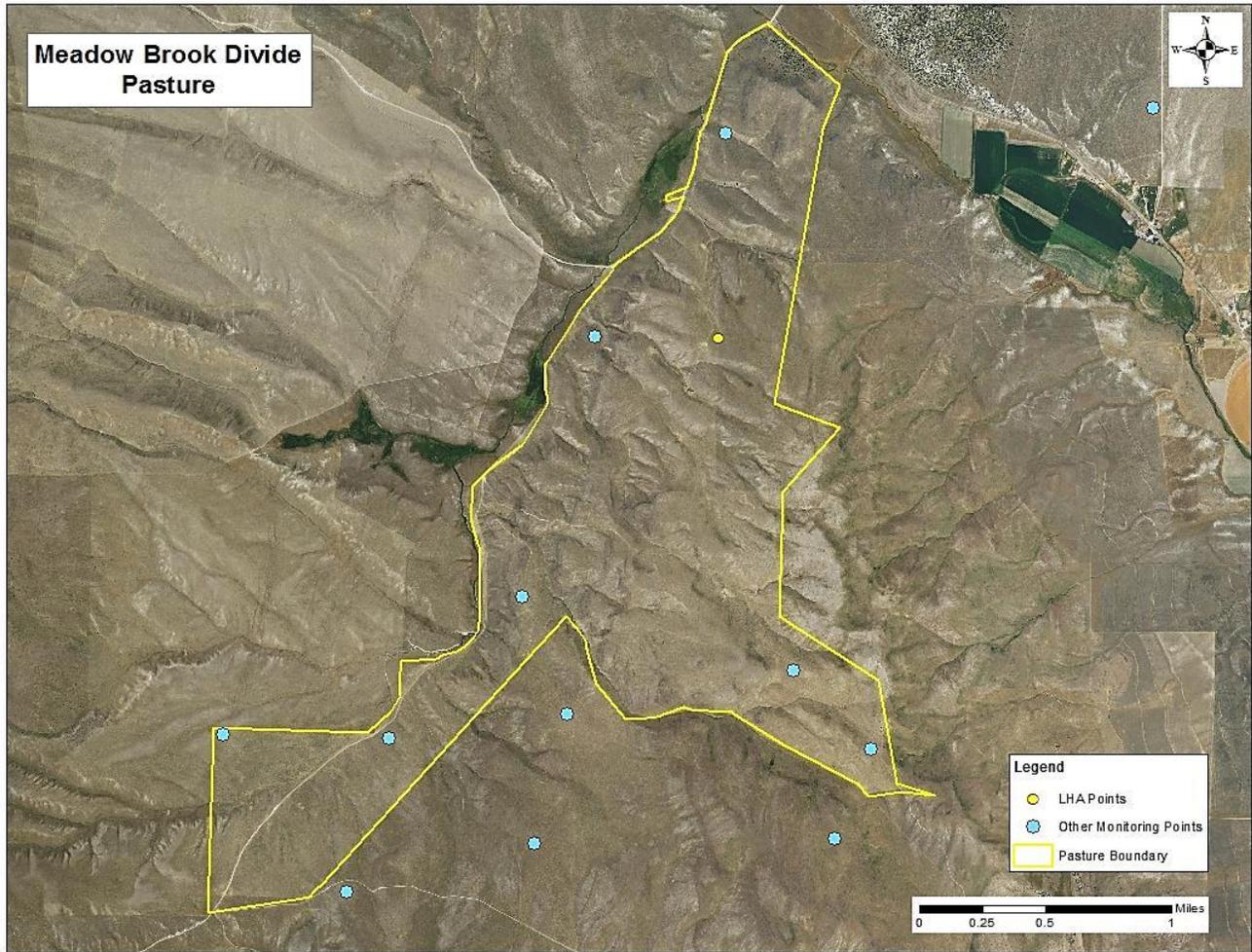
The seeding itself is in good condition with abundant crested wheatgrass canopy cover (35%) composed of large, vigorous plants. This is similar to the canopy cover reported for the HAF surveys in 2000, 2011, and 2012. The 2013 LHA also found that perennial forb canopy cover was 3% which is greater than what would be expected within a crested wheatgrass seeding. The fires of 2006/2007 reduced sagebrush canopy cover from 20% in 2000 to 0% in 2013, however, this is to be expected following wildfires. Green rabbitbrush, which re-sprouts following disturbance and is an early serial species, is currently the dominate shrub species.



Holbrook Burn Pasture (2,961 acres): The Holbrook Burn Pasture is comprised of both native vegetation and seedlings. The native vegetation occurs predominately on the slopes and ridges of the two prominent hills while the seedlings occur predominately on the flatter valley bottoms. The entire pasture burned during the fires of 2006/2007.

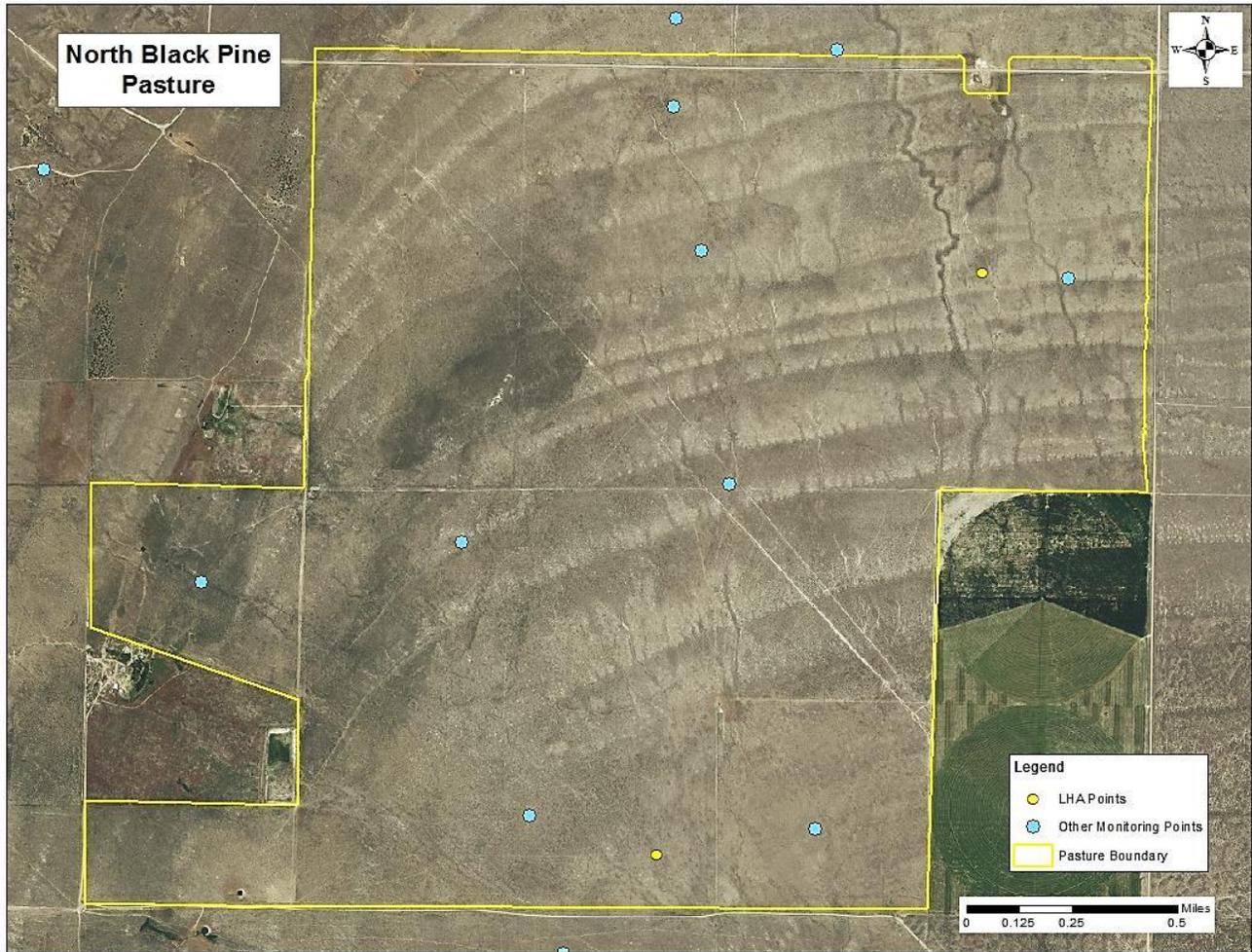
Native Vegetation: Utilization studies show that the native vegetation consists of bluebunch wheatgrass, Idaho fescue, Nevada bluegrass and bulbous bluegrass. The shrub component consists primarily of green rabbitbrush (*Chrysothamnus viscidiflorus*) though there are some pockets of unburned sagebrush to act as a seed source. The native vegetation is healthy with large clumps of bluebunch wheatgrass and needle and thread species. The 2013 LHA found that the biotic integrity was slight to moderately departed from what would be expected for the site mainly due to the lack of sagebrush following the 2006-2007 fires

Seeding: The seeding is robust and in good condition. Cover transects conducted in 2000 and 2011 found that crested wheatgrass canopy cover varied between 51-78%, with only 1-2% cheatgrass canopy cover and 4-6% perennial forb canopy cover. The crested wheatgrass plants are large, healthy, vigorous, and expansive. Few shrubs occur within the seeding. Sagebrush canopy cover decreased from 13% to 1% following the fires of 2006/2007, while other shrub species canopy cover increased from 2% to 5%. These other shrub species include bitterbrush, green rabbitbrush and horse brush.



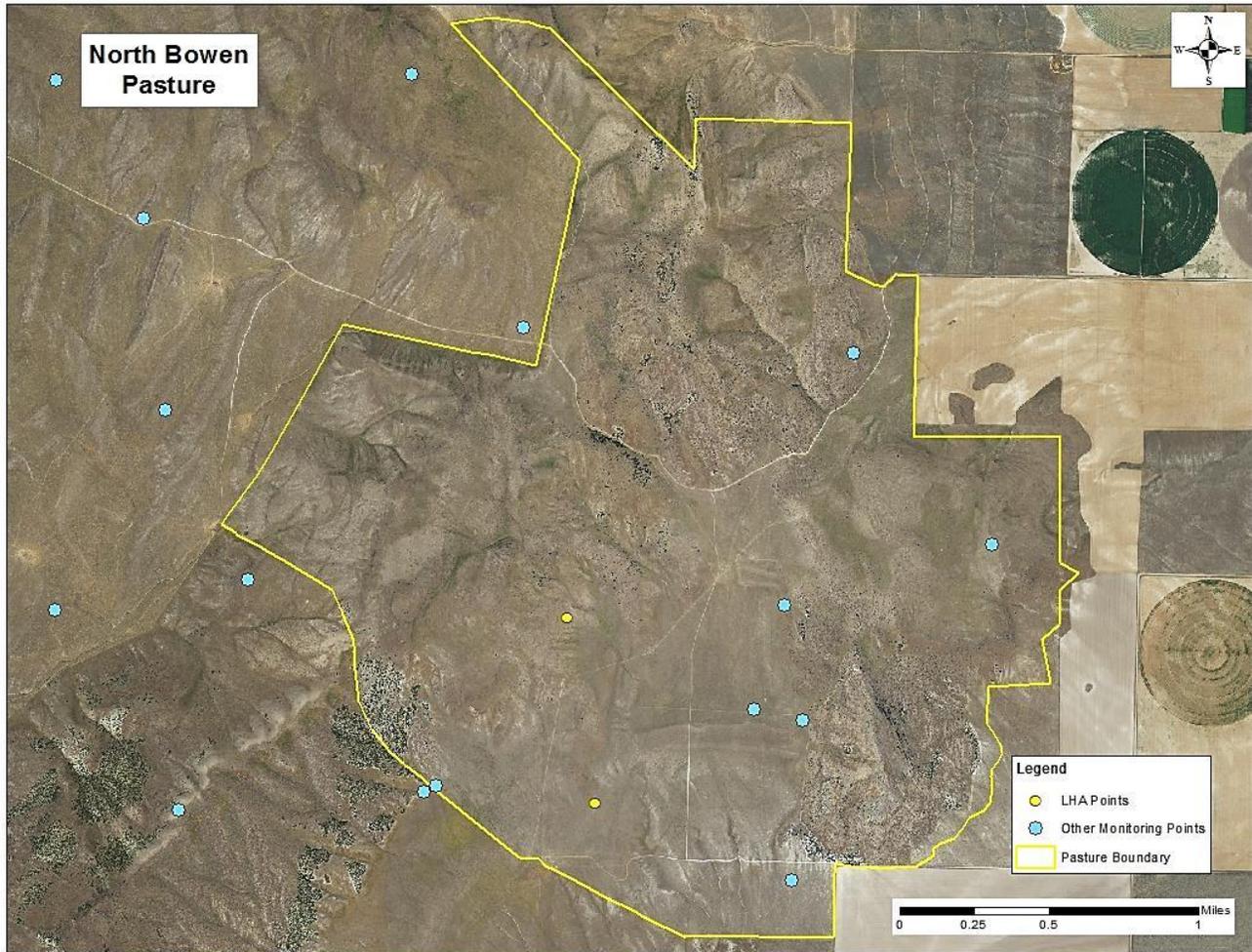
Meadow Brook Divide Pasture (1,976 acres):

The Meadow Brook Divide Pasture is comprised primarily of native vegetation although some seedlings do occur near the Meadow Brook Road. These seedlings were not delineated due to their small size. The Meadow Brook Divide Pasture was burned during the fires of 2006/2007. Since then the area has been recovering. The native vegetation consists of nearly 15% bluebunch wheatgrass canopy cover, and 29% Sandburg’s bluegrass canopy cover for a combined total of 51% native grass canopy cover. The LHA and HAF studies conducted in 2013 found that the biotic integrity of the site rated as none to slight departure from what would be expected. It also reported a canopy cover of 13% for green rabbitbrush (*Chrysothamnus viscidiflorus*) and only 1% canopy cover of sagebrush. Following fires this is not unexpected. Despite the low sagebrush canopy cover reported by the HAF, photos taken at the same time show several young sagebrush plants scattered throughout the site. In addition, the abundance and diversity of perennial forbs is relatively high with 16 species reported by the (HAF) data. All in all the pasture is healthy with a good diversity of native grasses, forbs and shrubs.



North Black Pine Pasture (2,471 acres):

The North Black Pine Pasture is a seeding that was planted on two distinct ecological sites. The southern portion of the pasture was planted on an Alkali Flat 8-12 ATCO-SAVE/ELEL5 ecological site and the northern portion was planted on a Loamy 8-11 ARTRT/PSSP6 ecological site with possible alkali soil inclusions. Two study sites were assessed within the pasture during the 2013 LHA, one in each ecological site. Both sites are moderately departed from what would be expected in terms of biotic integrity. Though utilization photos show that crested wheatgrass plants are well distributed throughout the pasture the assessments for both sites note the apparent lack of vigor of the seeded species. The crested wheatgrass plants are not producing up to potential, are spindly, and/or are dying in the middle of the crown. Crested wheatgrass cover was found to be 14% within the Loamy 8-11 ecological site and 19% within the Alkali Flat ecological site. The LHA data for both ecological sites mention the presence of halogeton. Sagebrush occurs at a low rate (6-8% canopy cover) except the southeast corner of the pasture where it is largely absent. Forbs are lacking throughout the pasture but this is expected within a crested wheatgrass seeding. Production studies indicate that perennial grass contributes approximately 646 pounds per acre within the Alkali ecological site and an average of approximately 394 pounds per acre within the Loamy ecological site. Generally the seeded plants appear to be in poor condition compared to adjacent seeded areas.

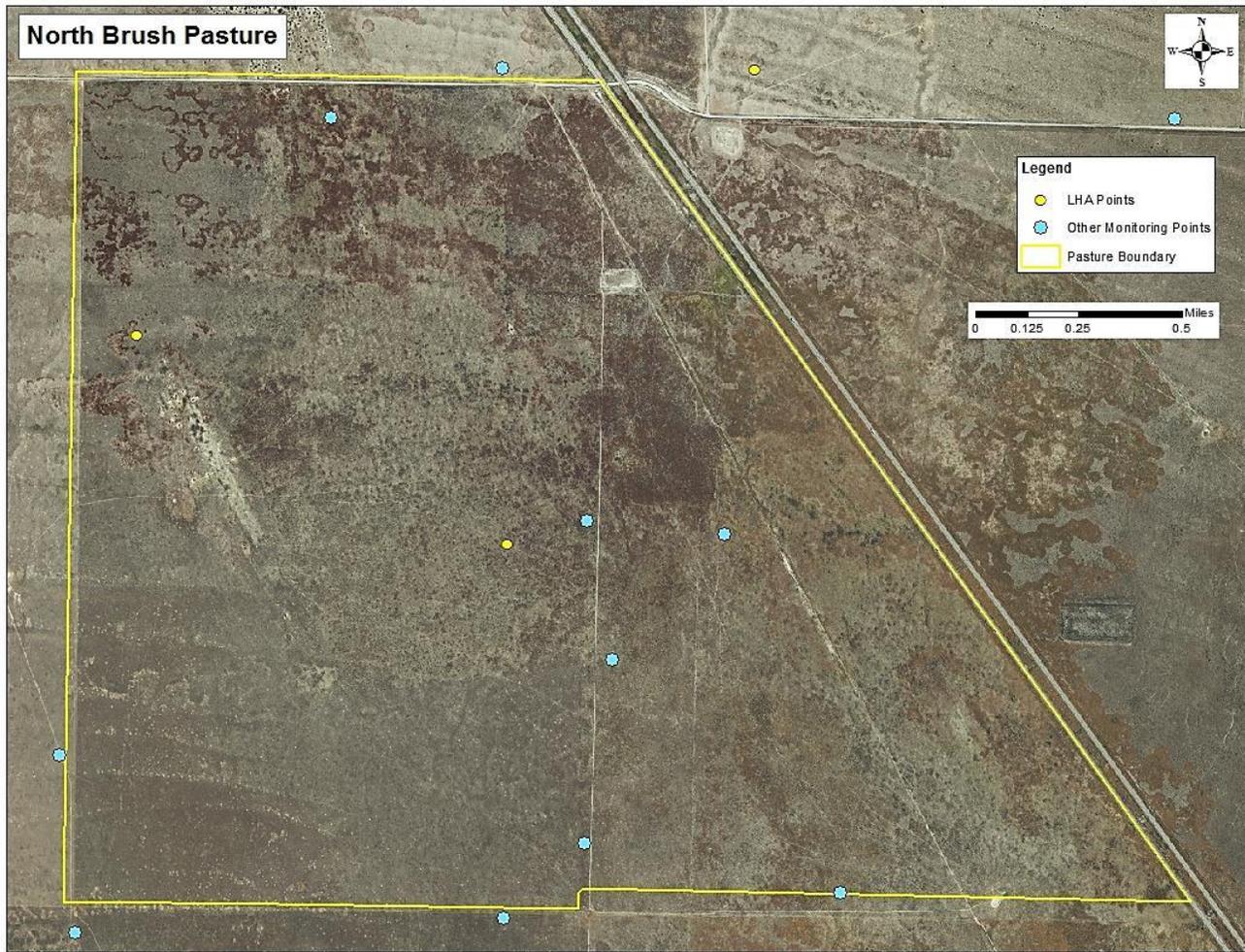


North Bowen Pasture (3,173 acres): The North Bowen Pasture is comprised of both native vegetation and seedings. The native vegetation occurs predominately on the slopes and ridges of the hills while the seedings occur predominately on the flatter valley bottoms. The North Bowen Pasture was burned during the 2006/2007 fires.

Native Vegetation: The native vegetation within the pasture is recovering following the 2006/2007 fires. The LHA and HAF studies conducted in 2013 reported that perennial native grass canopy cover is around 14%. A diverse compilation of native grasses occur within the pasture and include bluebunch wheatgrass, Indian ricegrass, and Needle and Thread. Sagebrush was greatly reduced due to the 2006/2007 fires but it is recovering. Photos taken at the time of the assessment show several young sagebrush plants scattered throughout the site. The photos also confirm the health of the native grass population by showing large, vigorous plants. Bulbous bluegrass and cheatgrass are scattered throughout the native portion of the pasture, however, they are not at a level to warrant much concern. It did however contribute to a slight to moderate departure from expected for biotic integrity of the site.

Seeding: Though the LHA noted that some of the crested wheatgrass plants were wolfy, the seeding is generally in good condition and vigorous. Crested wheatgrass canopy cover is 25% and the plants appeared to be reproducing well. In addition, the perennial forbs make up 3% canopy cover and were more diverse than expected in a seeding consisting. Forbs included: yellow salsify (*Tragopogon dubius*), scarlet globemallow (*Sphaeralcea coccinea*), and a lupine species. Although the pasture burned in 2006/2007 some sagebrush

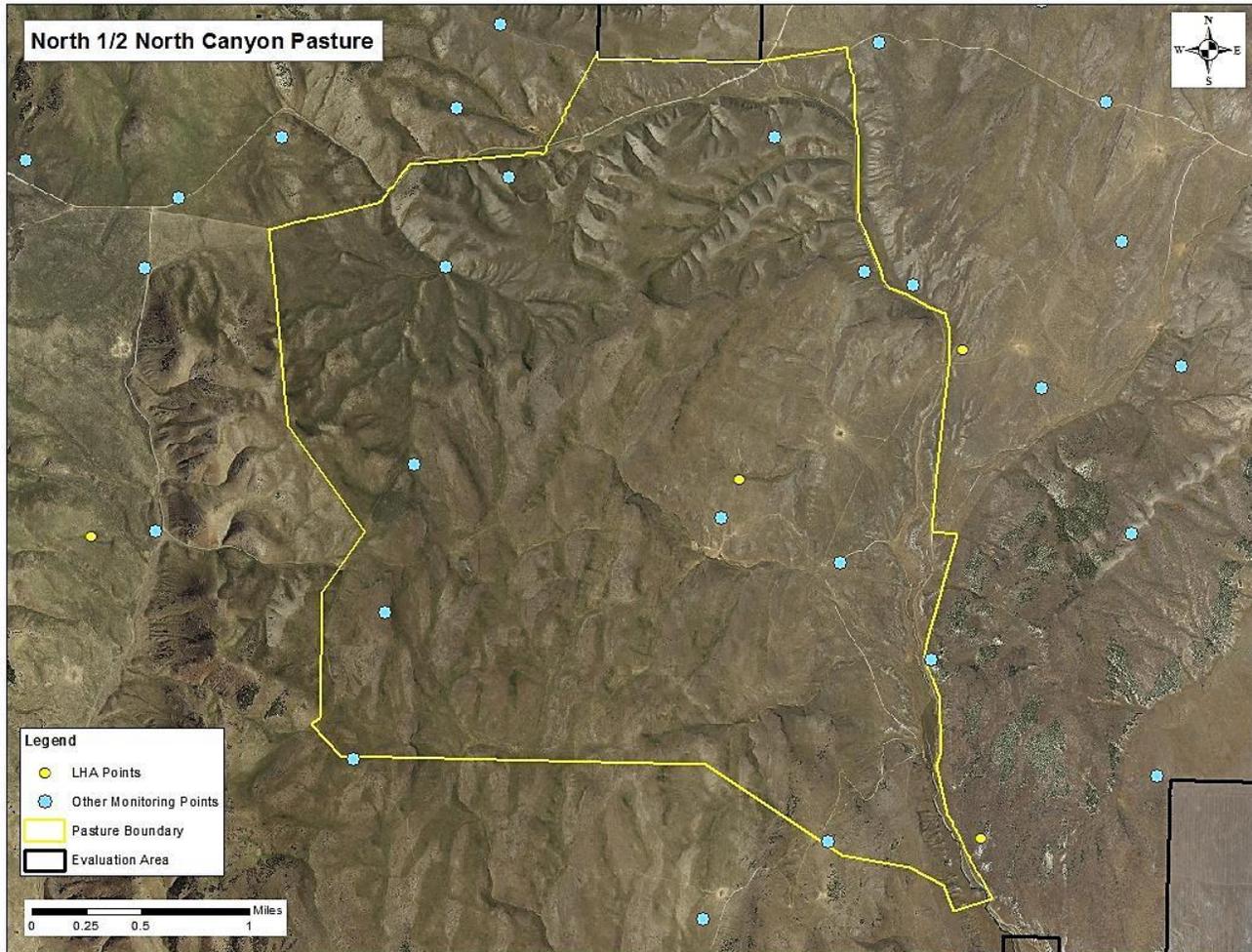
seedlings were observed in 2013. The lack of sagebrush contributed to a slight to moderate departure from expected for biotic integrity for the site.



North Brush Pasture (2,556 acres):

The North Brush Pasture is a seeding. The seeding was planted on a Loamy 8-11 ARTRT/PSSP6 ecological site with some Alkali soil inclusions. These inclusions may explain the lack of sagebrush from areas throughout the pasture. Two study locations were assessed during the 2013 LHA. One of the study sites occurred within a recently burned area. No sagebrush was encountered within this area; however outside of the burned area sagebrush is prevalent with canopy cover as high as 23%.

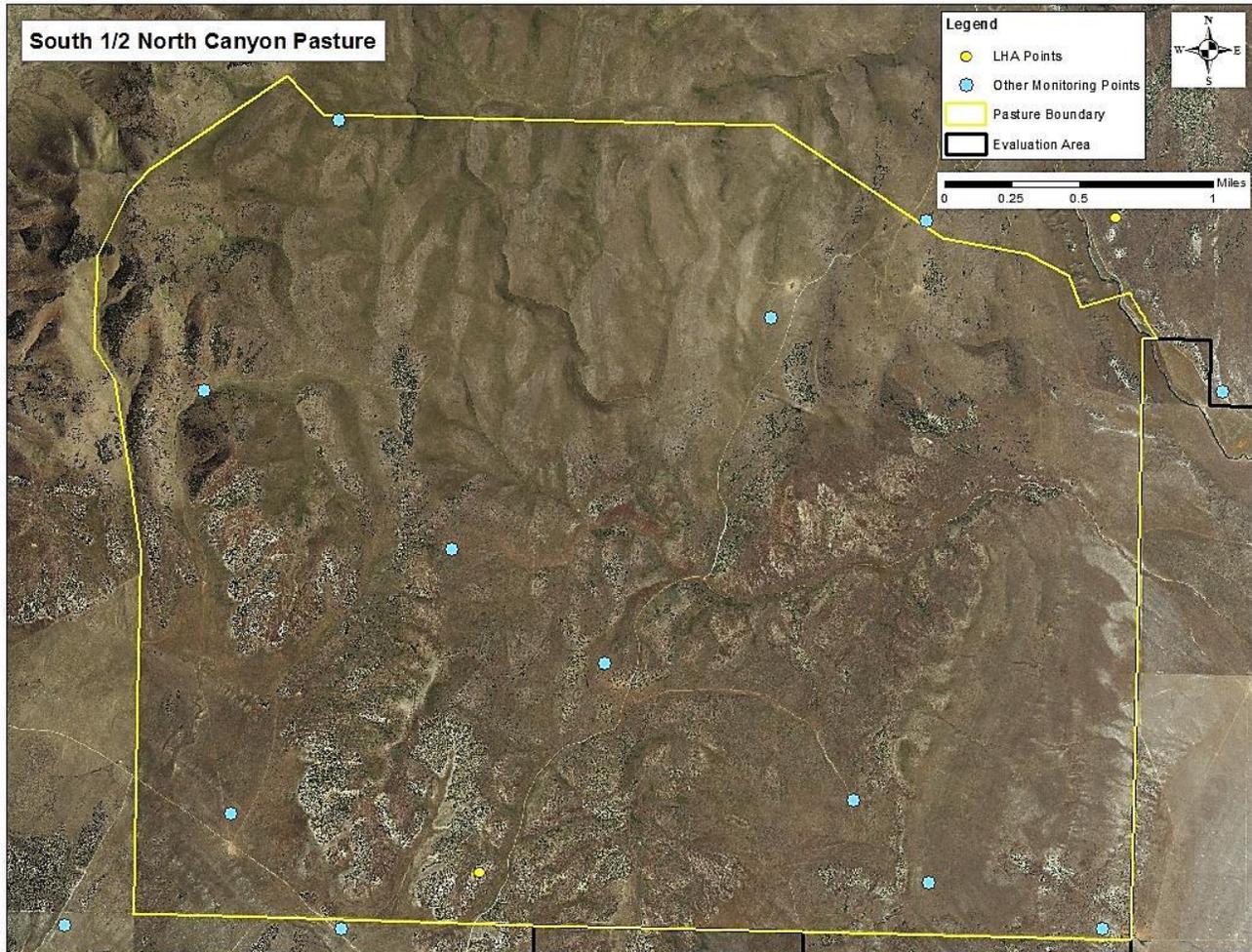
The crested wheatgrass throughout the pasture appears unhealthy. Several of the LHA studies noted that the centers of a significant number of plants are dead. Other plants are spindly and lack vigor. Crested wheatgrass canopy cover varied between 0 and 7%. The crested seeding may be more productive near the southern portion of the pasture. Cheatgrass and Russian thistle are common throughout the pasture, even within the more productive crested sites. Perennial forb canopy cover is low (0-1%) but this is to be expected in a seeding. The reduced vigor of the seeded species and the increase of invasive species contributed to a moderate departure rating for the biotic integrity attribute of the 2013 LHA. Production studies conducted in 2014 found that the average production of perennial grasses is 442 lbs/acre and ranged between 259 lbs/acre and 577 lbs/acre.



North Canyon North Half Pasture (5,631 acres): The North Canyon Pasture North Half is comprised of both native vegetation and seedings. The native vegetation occurs predominately on the slopes and ridges of the hills while the seedings occur predominately on the flatter valley bottoms near the roads.

Native Vegetation: Several studies have been conducted within this pasture including HAF studies in 2000, 2012 and 2013 as well as a LHA. The studies show that the native vegetation is composed of a healthy composition of perennial grasses (41-47% canopy cover), and perennial forbs (11-13.5% canopy cover). Prior to the fires in 2006/2007 the north half of North Canyon Pasture had approximately 24% sagebrush canopy cover. Although neither of the HAF studies performed after the fires recorded any sagebrush canopy cover, photos taken at the time of the assessments show several young sagebrush plants scattered throughout the site. This may be due to the aerial seeding of mountain big sagebrush that was conducted after the 2006-2007 fires within the pasture. In addition, the Land Health Assessment in 2013 noted that although mature sagebrush were lacking due to fire, the sagebrush was re-establishing. It went on to state that the site was comprised of native shrubs, forbs, and grasses sufficient to maintain ecological processes. This led to a rating of slight to moderate departure for biotic integrity for the 2013 LHA.

Seeding: The seeding was burned during the 2006/2007 fires and subsequently aerially seeded with mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Utilization photos from 2008 and 2010 show that sagebrush seedlings are present within the seeding. It also appears that the crested wheatgrass plants are healthy and vigorous.

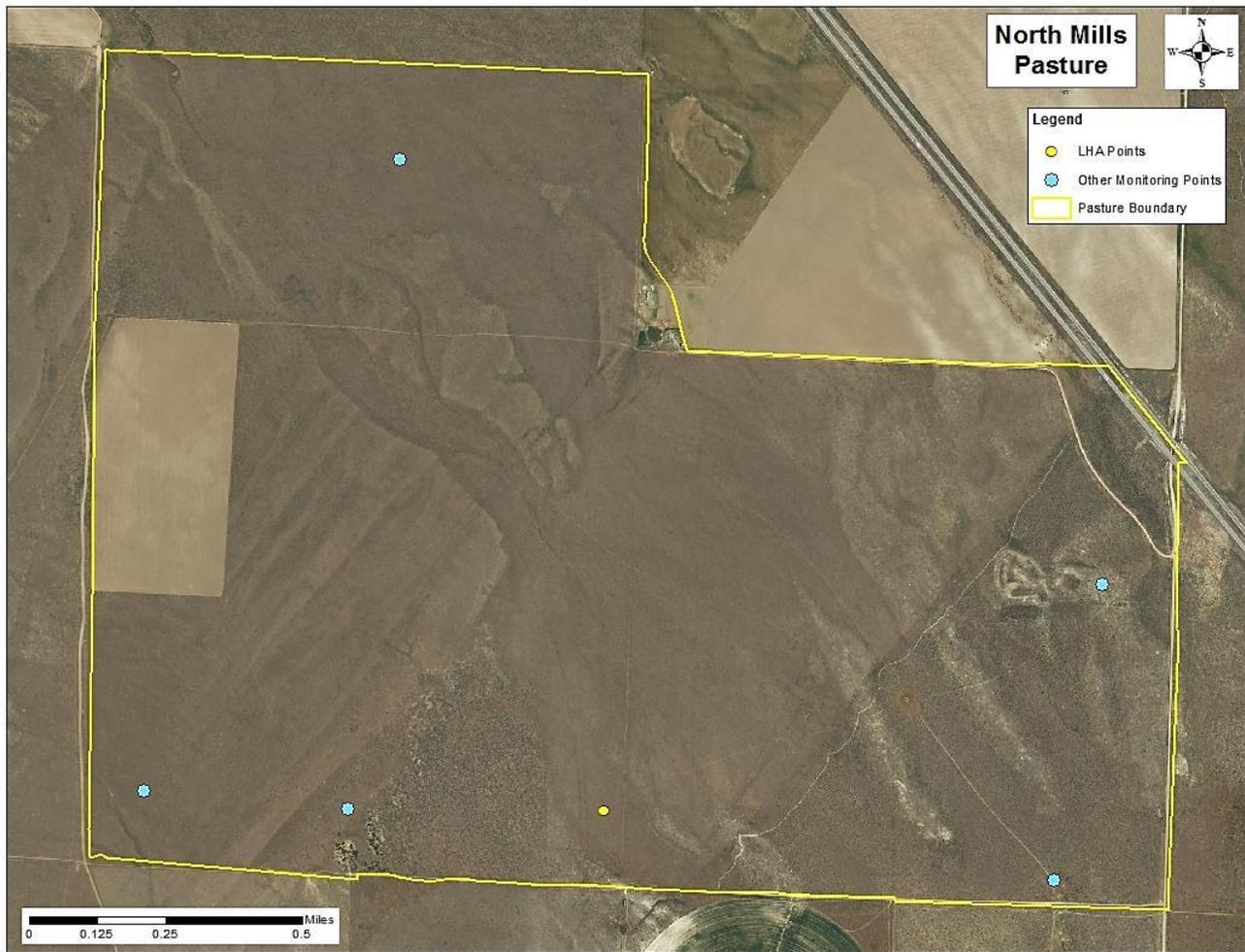


North Canyon South Half Pasture (6,917 acres): The North Canyon Pasture South Half is comprised of both native vegetation and seedings. The native vegetation occurs predominately on the slopes and ridges of the hills while the seedings occur predominately on the flatter valley bottoms.

Native Vegetation: The native vegetation within the North Canyon South Half Pasture can be divided into two categories; native vegetation associated with juniper stands and native vegetation not associated with juniper stands. Those sites not associated with juniper stands had a sagebrush canopy cover of nearly 25%. However, after the fires of 2006/2007 the sagebrush canopy cover dropped to 0% in 2011. The perennial grass canopy cover increased from 21% to 56% and was composed primarily of bluebunch wheatgrass and Sandberg bluegrass. These sites appear to be in the early serial stages of recovery.

Native sites associated with juniper stands were assessed during the Land Health Evaluation in 2013 and associated HAF study. These studies found these sites are not within the normal range of variation expected for a Steep Slope 16-22 ARTRV/PSSP6 Ecological site in terms of perennial bunchgrasses and sagebrush. This led to a moderate departure for the biotic integrity attribute of the Land Health Assessment. This is attributed to the low perennial grass canopy cover (approximately 3%) and lack of sagebrush. This reduction in perennial grasses and native shrubs is probably the result of increasing juniper densities followed by severe fire intensities. Areas associated with juniper stands are recovering slowly. The LHA noted that the diversity of native species is not maintained, reproductive capability is reduced and annual production is less than expected.

Seeding: The seeding portion of the pasture was burned during the 2006/2007 fires and seems to be responding well to the disturbance. Utilization photos from 2010 and 2012 show that within the majority of the seeding the crested wheatgrass plants are in good condition and vigorous.

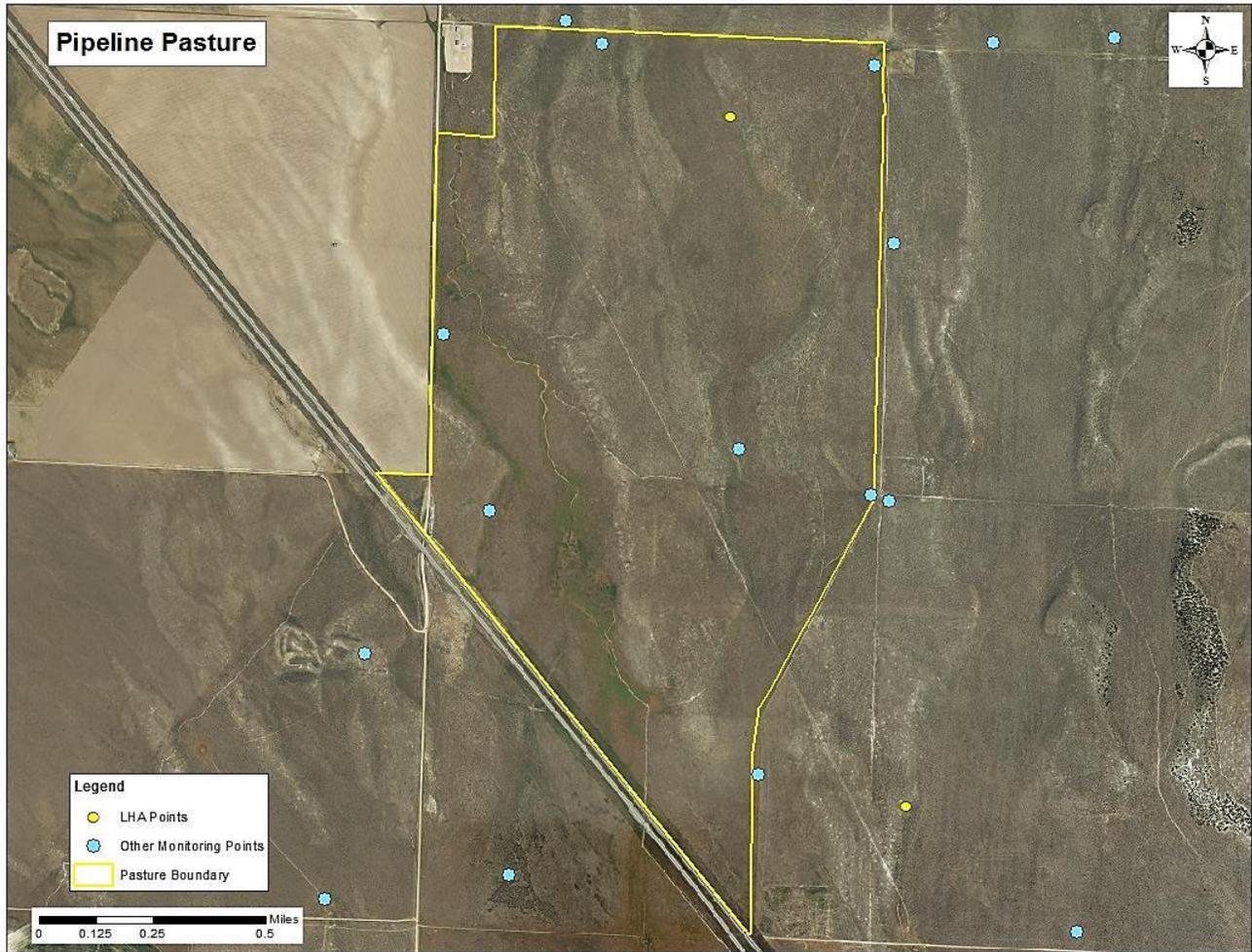


North Mills Pasture (1,590 acres):

The North Mills Pasture is a crested wheatgrass seeding of which approximately 2/3 burned in 2006. Following the wildfire sagebrush canopy cover decreased from 17% to 0%, despite the aerial application of sagebrush seed to the area. Other shrub species canopy cover also decreased from 8% to 1%. Utilization photos from 2012 show abundant, healthy crested wheatgrass plants within the burned portion of the seeding.

The southeast corner of the pasture was not burned in the 2006 wildfire. Utilization photos from 2012 show that mature sagebrush cover is abundant and that the crested wheatgrass plants are smaller and less vigorous than those within the burned portion of the pasture. However, these photos also show that crested wheatgrass plants exist both within the interspaces and under shrubs. Both LHA and HAF studies were conducted within the burned portion of the pasture in 2013. The HAF studies found crested wheatgrass canopy cover is 38%. The abundant, healthy crested wheatgrass contributed to a rating of slight to moderate departure for the biotic integrity attribute of the site.

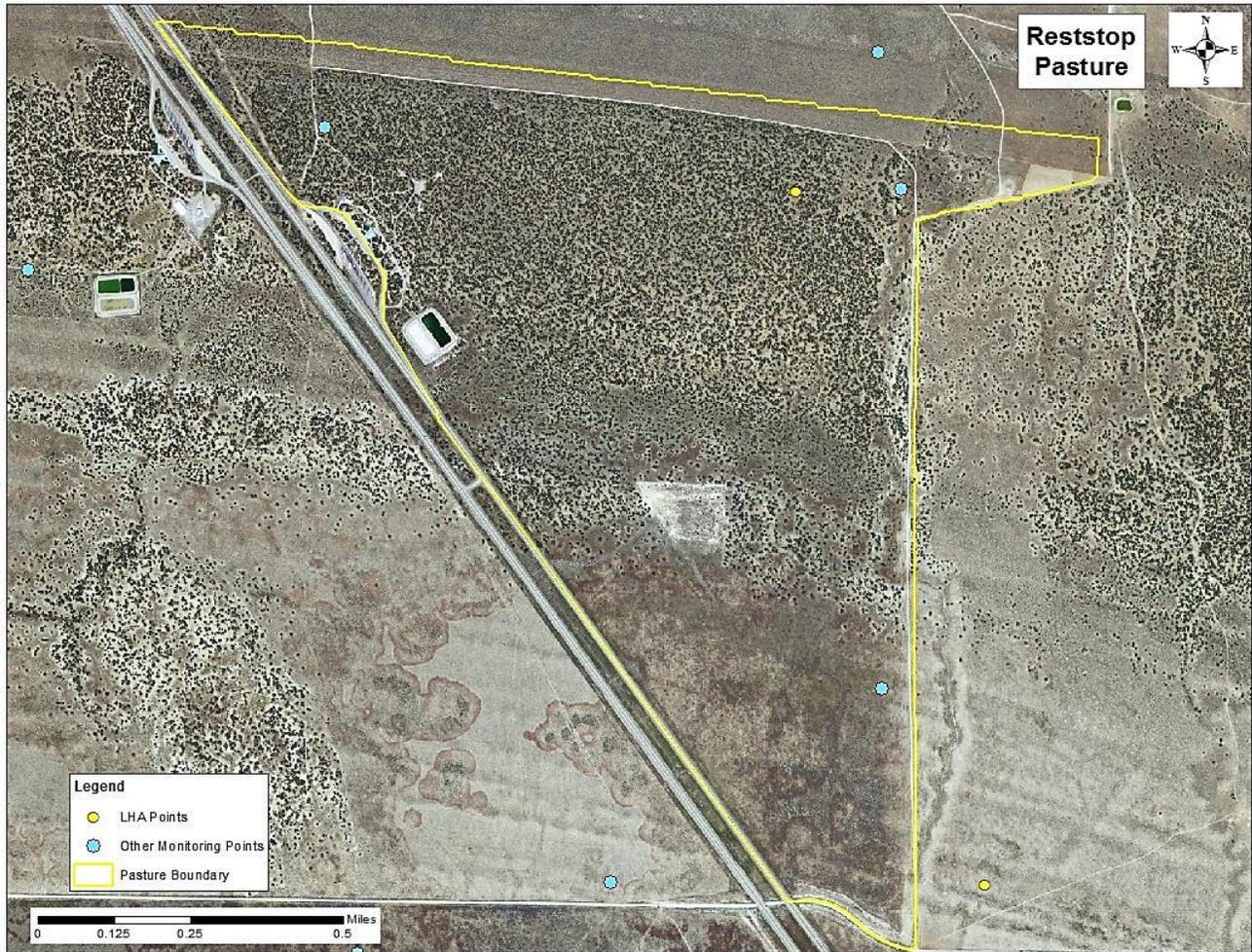
The North Mills pasture is a productive crested wheatgrass seeding with healthy, vigorous plants occurring within the burned portion of the pasture and a resilient population of crested wheatgrass occurring within the unburnt portion.



Pipeline Pasture (920 acres):

The Pipeline Pasture is a seeding. Portions of the pasture burned in smaller fires during the 2006/2007 fire season. Within the burnt portions of the pasture the crested wheatgrass is the dominate species and is comprised of large healthy plants (Utilization photos). The 2013 Land Health Assessment was conducted outside of the burned area and received a rating of slight to moderate departure for biotic integrity. It found that crested wheatgrass canopy cover was 33%. The LHA of 2013 noted that the crested wheatgrass plants at the site assessed were not vigorous, however photos from the 2012 utilization studies across the pasture show healthy, vigorous crested wheatgrass plants.

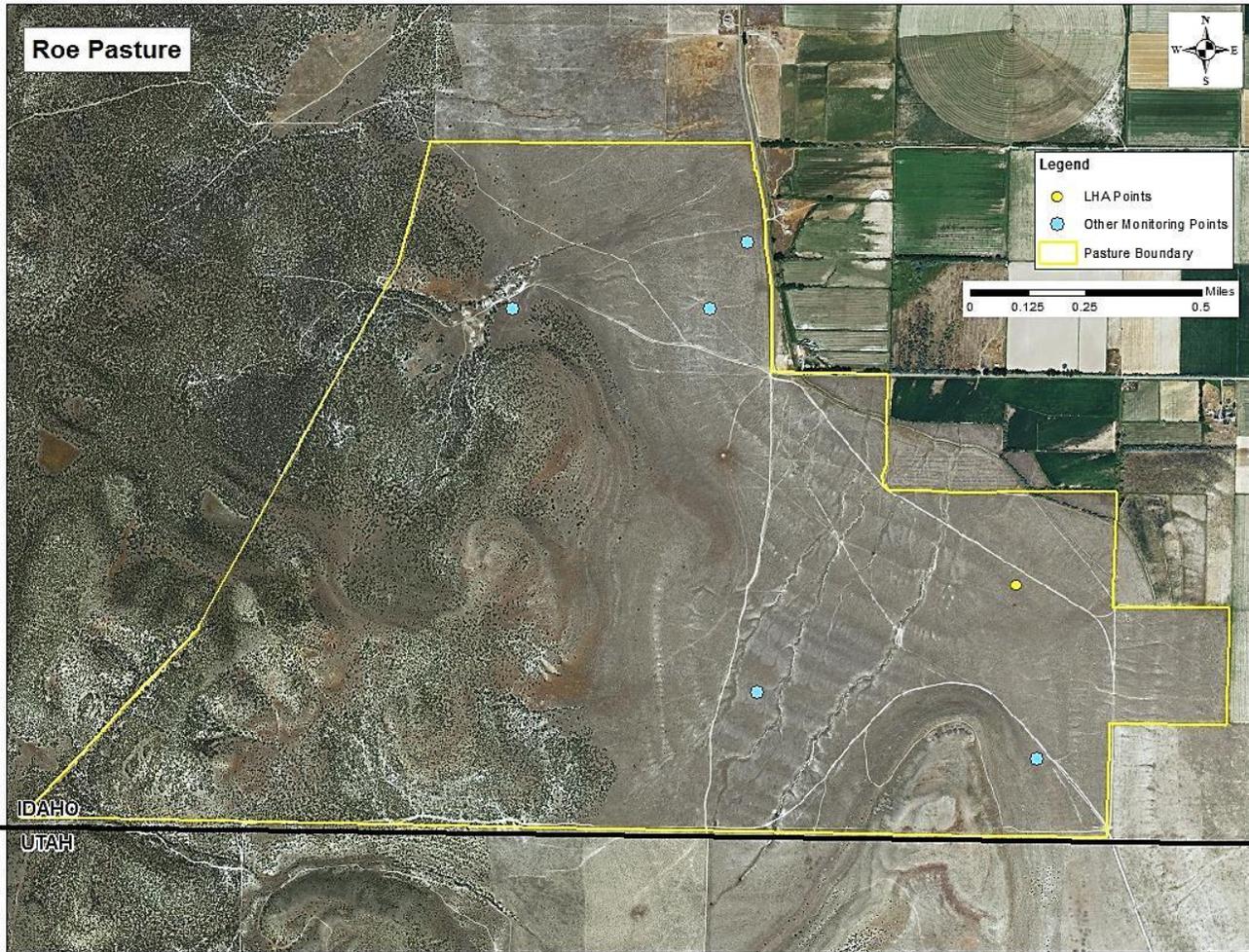
There is a wide variation of vegetative communities within this pasture. Within the burned area, there is a near monoculture of healthy crested wheatgrass plants with a few rabbitbrush. Within the non-burned portion of the pasture there is a good mixture of mature sagebrush, healthy crested wheatgrass, rabbitbrush, and some perennial forb species. Steep terrain and the main drainage within the pasture are dominated by vigorous native grasses.



Rest Stop Pasture (628 acres): Approximately half of the Rest Stop Pasture is a seeding. The Rest Stop Pasture also contains a portion of the Juniper Belt associated with the ancient shoreline of Lake Bonneville. A private land inholding makes up over a third of this pasture.

Native Vegetation: Native vegetation exists within this juniper belt. A Land Health Assessment and associated HAF study indicates that the Juniper Belt has 14% perennial grass canopy cover; consisting mainly of Needle and thread, Sandberg bluegrass and 7% perennial forb canopy cover. No sagebrush was encountered during sampling. A fairly well developed and well distributed microbiotic crust exists within the Juniper Belt.

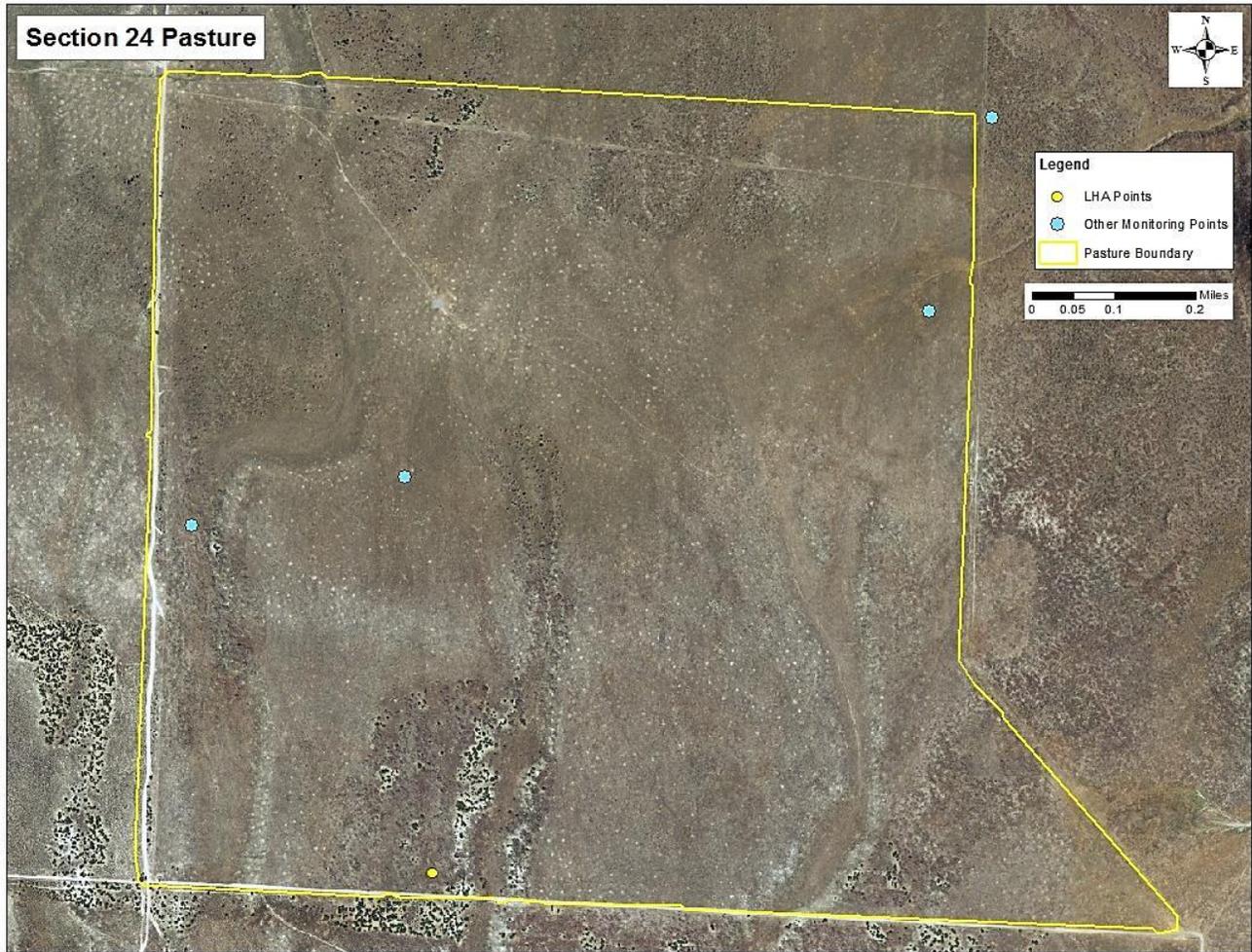
Seeding: The seeding occurs within the southern portion of the pasture. No cover or LHA studies have been conducted within the seeding portion of the Rest Stop Pasture. Based on utilization photos from 2012 the seeding appears healthy. Mature sagebrush is scattered throughout the seeding and crested wheatgrass appears to be abundant on the site.



Roe Pasture (1,470 acres): The Roe Pasture consists of both native vegetation and seedings. The native vegetation is predominately associated with steeper slopes and juniper stands while the seedings are predominately located on the flatter valley bottoms.

Native Vegetation: Based on aerial photos from 1992 to 2013 the juniper stands seem to be expanding into the higher valleys within the western portion of the pasture. Currently the juniper stand appears to be somewhere between a Stage II and Stage III juniper encroachment however field reconnaissance has shown that some bowls still possess adequate native grasses and some shrubs including sagebrush. Removal of the juniper from these areas would reinvigorate the sagebrush, native grass community.

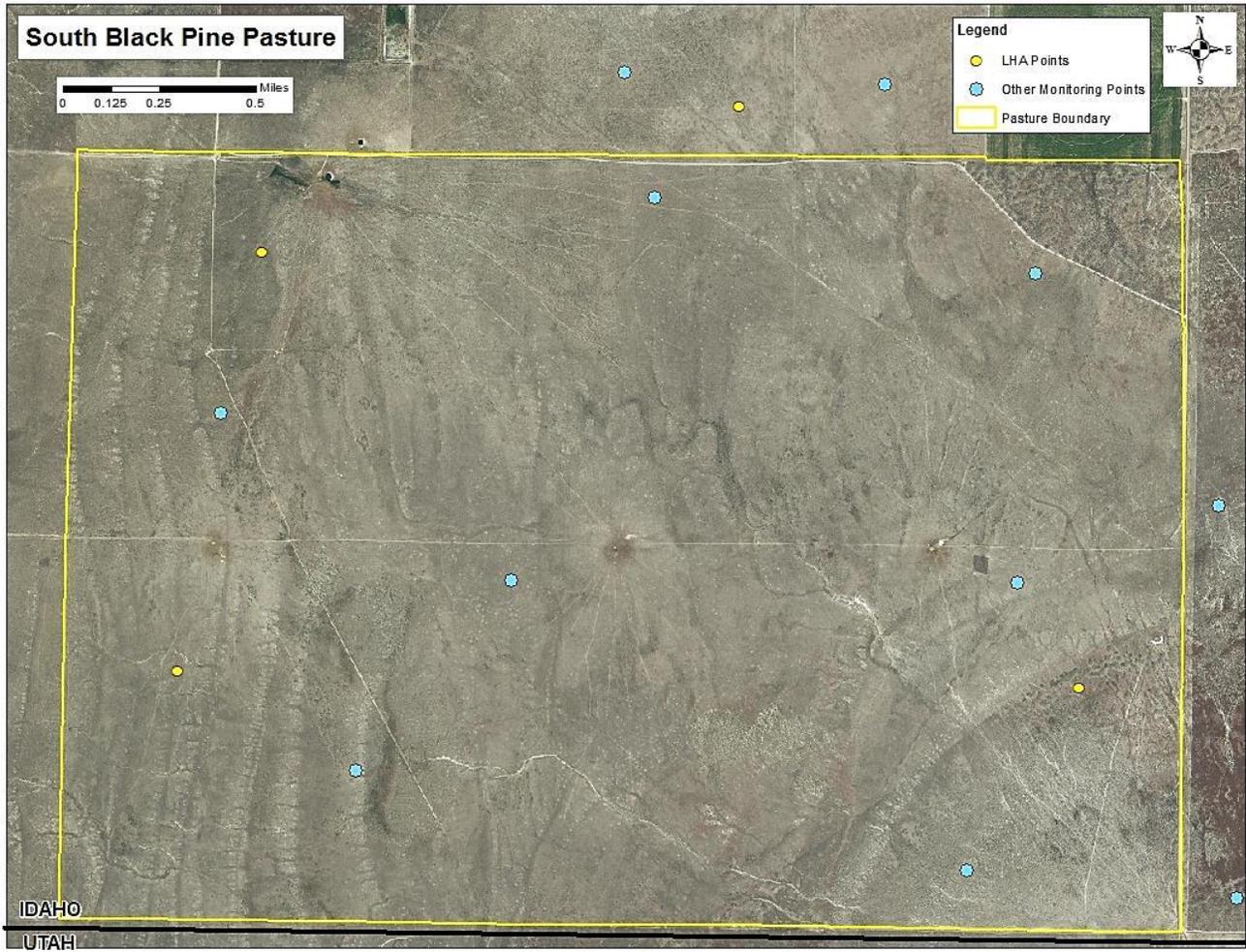
Seeding: The LHA conducted in 2013 found that crested wheatgrass was vigorous and abundant (20% canopy cover). This is supported by utilization photos taken in 2011 that show healthy plants with abundant seed heads. The LHA also noted that the pasture had been planted with short lived forbs at the same time it was planted to crested wheatgrass. These forbs have since disappeared and native perennial forbs have failed to recolonize the area. Mature sagebrush is present within the seeding (22% canopy cover). The LHA noted that weedy species are present along the roads however it does not mention any weedy species within the seeding itself. The biotic rating for the seeding is slight to moderate departure.



Section 24 Pasture (665 acres):

The Section 24 Pasture is a seeding that was burned in 2006/2007. Following the fires the pasture was aerially seeded with Mountain Big Sagebrush (*Artemisia tridentate* ssp. *vaseyana*). A second sagebrush treatment was conducted in 2013. Twenty thousand bare root sagebrush seedlings were planted with a tractor along the northern portion of the pasture. As of 2014 this treatment has a survival rating of 39%.

The seeding appears healthy with large, robust crested wheatgrass plants (utilization photos 2011, 2012). This is supported by the 2013 LHA data which found that crested wheatgrass had 28% canopy cover. It also noted that mature sagebrush are largely absent from the pasture but that they are re-establishing. The LHA found that the biotic integrity of the site is slight to moderately departed mostly due to the lack of mature sagebrush on the site.

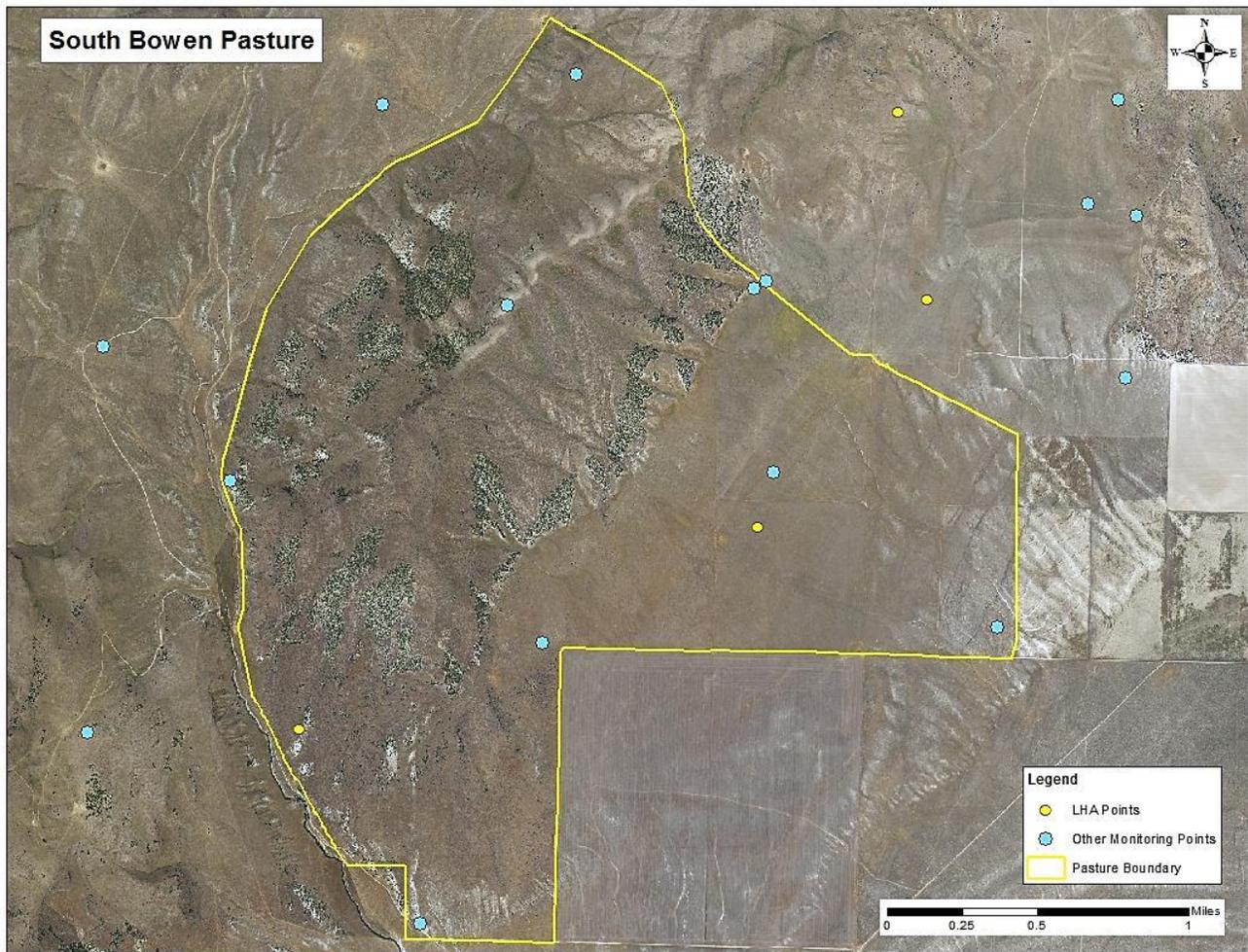


South Black Pine Pasture (3,534 acres):

The South Black Pine Pasture is a seeding. The southeast corner is on an Alkali Flat ecological site while the rest of the pasture is on a Loamy 8-11 ARTRT/PSSPS ecological site; however, it is believed that there are several large inclusions of alkali soils based on observations. Three study sites were assessed within the pasture during the 2013 Land Health Assessment. The site located within the Alkali Flat ecological site found that the seeded species (crested wheatgrass) was lacking in large portions of the area and that halogeton (*Halogeton glomeratus*) and other annual forbs were the dominate herbaceous cover. In the areas where crested wheatgrass was present it contributed only 3% of the canopy cover. It also noted a difference between plants growing in the interspaces between shrubs and those growing under shrubs. Those plants growing in the interspaces lacked vigor, were dying in the middle of the crown and produced few seed heads while those growing under shrubs produced abundant seed heads. Production studies conducted in 2014 within the alkali ecological site found that perennial grasses contributed 192 lbs/acre. The biotic integrity of the site assessed within the alkali ecological site was determined to be moderately departed from what would be expected.

The same can be said for the portion of the seeding located in the northwest corner of the pasture; the biotic integrity was assessed to be moderately departed from what would be expected. This was due to a decrease in vigor of the seeded species. This site has a greater crested wheatgrass canopy cover at 21%, however production studies conducted in 2014 concluded that the area produces approximately 270 lbs/acre of perennial grasses. This site was located on the Loamy ecological site but may contain alkali inclusions.

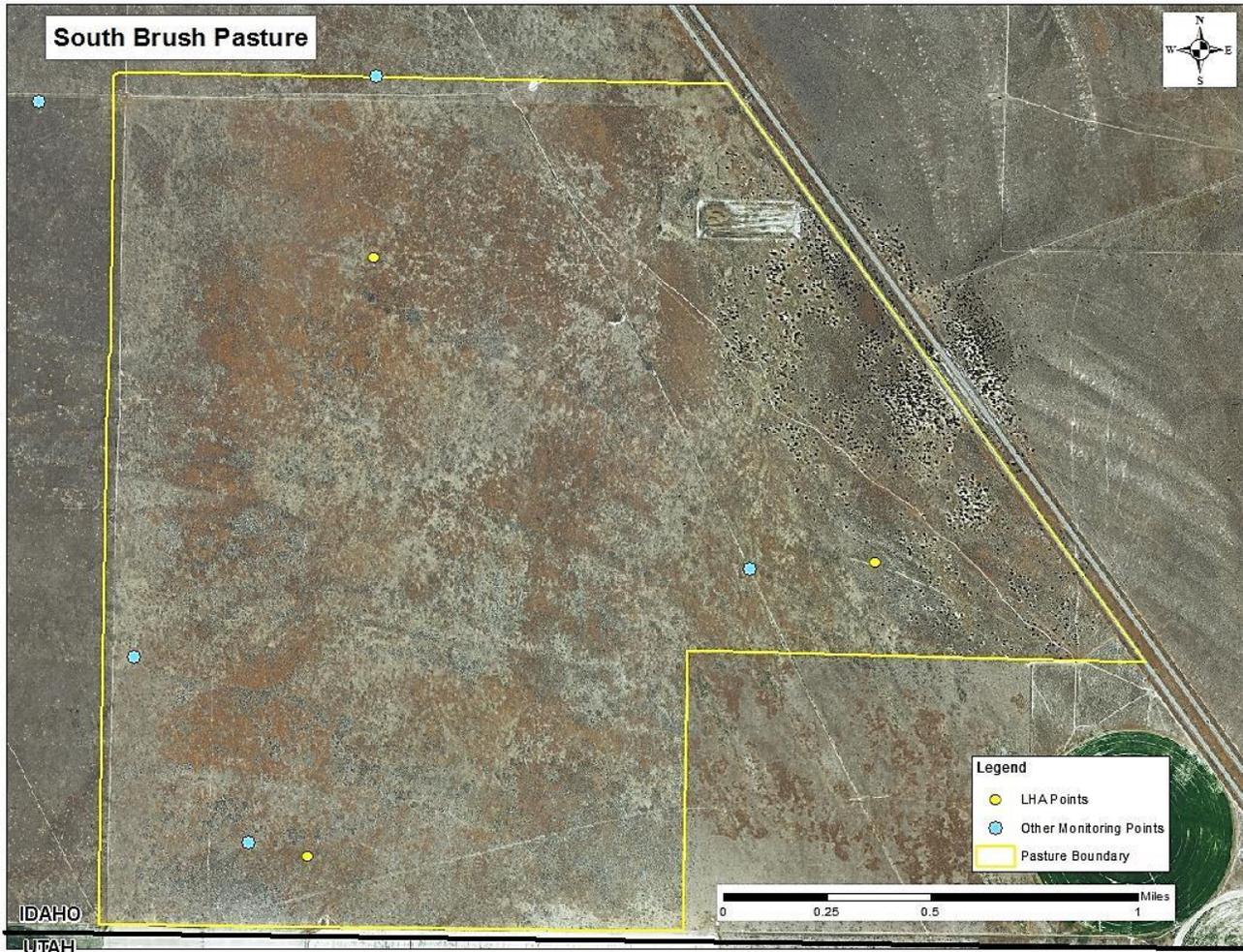
The final site located in the southwest corner of the pasture found the crested wheatgrass plants to be healthy with a canopy cover of 18%. The site had only 1% perennial forb canopy cover but this is to be expected within a crested wheatgrass seeding. Utilization photos show that a majority of the pasture has few shrubs and abundant, healthy crested wheatgrass plants. The 2014 production studies found that the Loamy ecological site produced an average of 520 lbs/acre of perennial grasses.



South Bowen Pasture (2,853 acres): The South Bowen Pasture is comprised of both native vegetation and seedings. The native vegetation occurs predominately on the slopes and ridges of the hills and in association with juniper stands while the seedings occur predominately on the flatter valley bottoms.

Native Vegetation: Prior to the 2006/2007 fires juniper stands existed on the dominate ridge that runs from the southwest to northeast through the pasture. Following the fires the native vegetation seems to be recovering. According to the Land Health Assessment of 2013 and concurrent HAF studies no sagebrush was encountered through sampling. However, photos taken at the time of the studies and notes written during the LHA confirm that young sagebrush plants are interspersed throughout the site. In addition, perennial grass cover was nearly 40% and was composed of Indian ricegrass, bluebunch wheatgrass, Basin wildrye, and needle and thread species. Only 1% cheatgrass canopy cover was recorded during the 2013 HAF study, but cheat grass was noted to occur primarily under junipers and where the juniper canopy cover was greatest prior to the 2006/2007 fires. These findings demonstrate that the native portion of the pasture is resilient, and progressing from an early serial stage following the fires to a more complex serial stage with varied structural components.

Seeding: A large portion of the seeding within the pasture as burned during the 2006/2007 fires. Prior to the fires sagebrush had a canopy cover of nearly 9% but following the fires the 2013 LHA/HAF studies failed to encounter any sagebrush. Even though no sagebrush was encountered during sampling, the LHA noted that sagebrush was re-establishing on the site and several are visible in the photos taken at the time. Within those portions of the seeding that burned, the crested wheatgrass is abundant, large, and highly productive. One concern is the proportion of bulbous bluegrass within the seeding (7% canopy cover). Though it is not believed that within the current environment it would increase in distribution, it is an aggressive species within disturbed areas and contributed to a slight to moderate departure rating for the biotic integrity attribute.



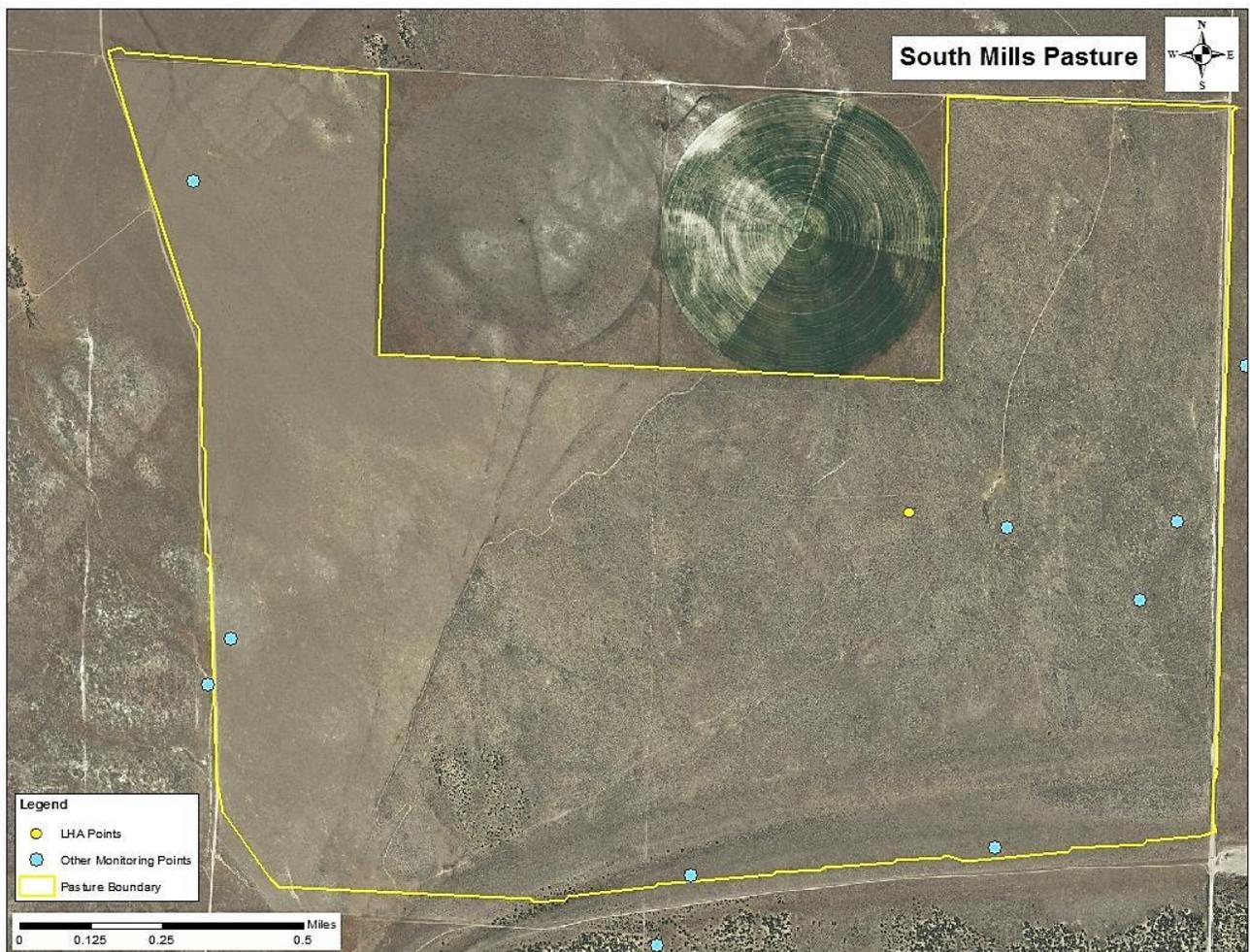
South Brush Pasture (2,329 acres):

The South Brush Pasture is a seeding that was planted on two distinct ecological sites (Alkali Flats 8-12 ATCO-SAVE/ELLEL5 and Loamy 8-11 ARTRT/PSSPS). THE LHA and HAF studies of 2013 found that crested wheatgrass canopy cover within the Alkali flats ecological site was 0%, perennial grass (Thick spike wheatgrass) canopy cover was 15%, sagebrush canopy cover was 19% and other shrubs had a canopy cover of 9%. Cheatgrass and annual forbs such as halogeton and bur butter cup were common throughout the site. Overall the site is not producing up to potential due to the lacked bunchgrasses, especially the seeded species crested wheatgrass and received a moderate departure from what would be expected for the biotic integrity attribute.

Two study sites were located within the Loamy ecological site and both received a moderate departure rating for biotic integrity. This was due to the distribution and healthy of the seeded species. Crested wheatgrass

canopy cover varied between 0 to 1% and the plants were smaller than would be expected. Perennial grasses had a canopy cover between 5 and 26%, which was composed of needle grass species and thick spike wheatgrass. Cheatgrass ranged between 7 and 20% of the canopy cover while sagebrush ranged between 13 and 18%. The values found in the 2013 LHA and HAF studies are similar to those found in the 2000 HAF studies. The lack of crested wheatgrass and the abundance of native perennial grasses indicate that portions of the pasture may not have been seeded, that the seeding may not have established or that it has declined with age. Utilization photos do show some isolated pockets with well-established crested wheatgrass stands, however, overall the seeding lacked bunchgrasses, especially the seeded species crested wheatgrass. The amount of cheatgrass that was found throughout the pasture is well above what would be expected for the site and is of concern. The 2014 production studies found that perennial grasses contributed on average 340 lbs/acre to the forage base.

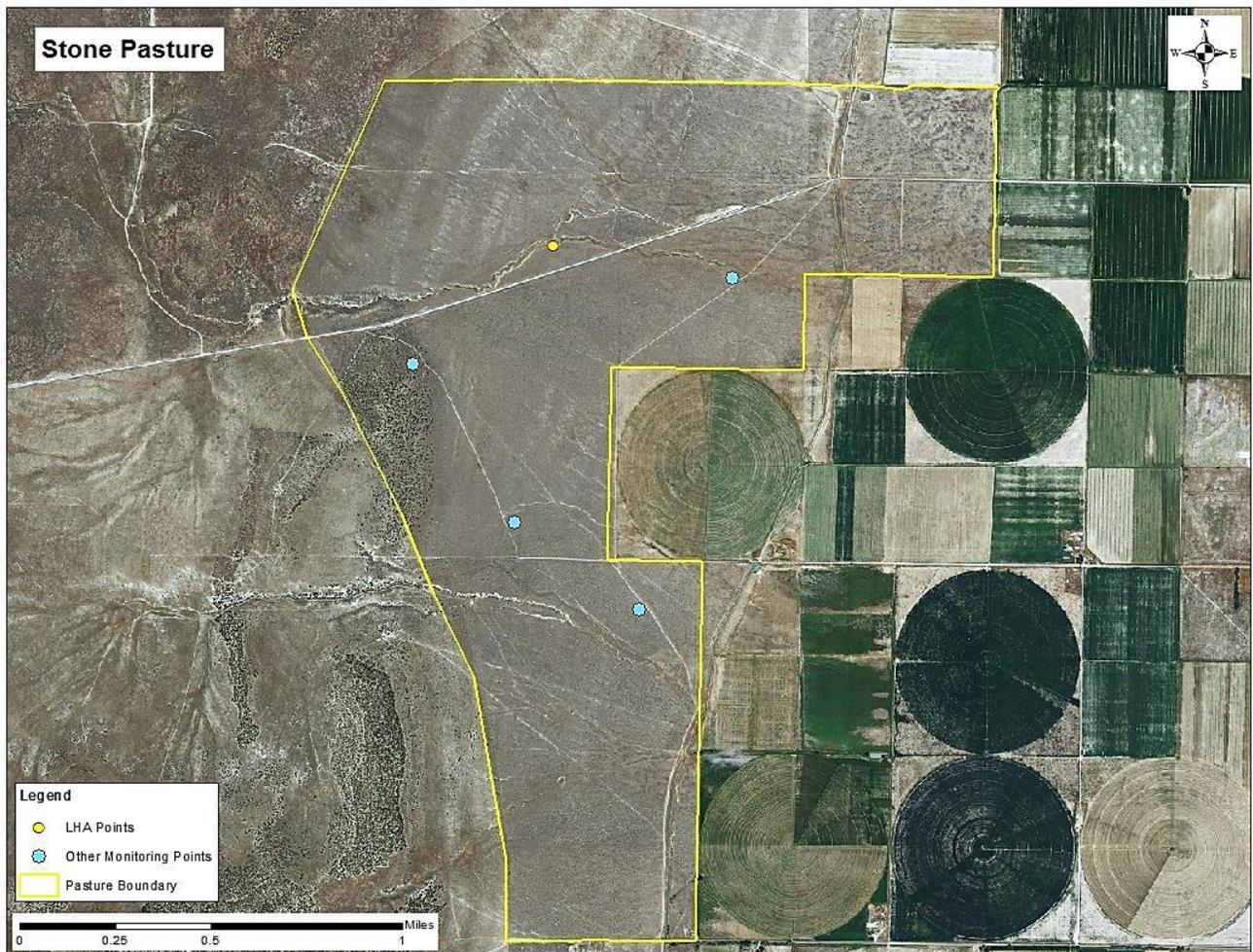
Along the eastern edge of the pasture a small strip of junipers exist. These junipers appear to be on an inclusion of sandy soil and of the same age class as those occurring within the Bowhuis pasture. Needle and thread grass species as well as Indian rice grass are common throughout the juniper stand. The 2014 production studies found that perennial grasses contributed 138 lbs/acre to the forage base. Intermixed within the older junipers and within the sagebrush adjacent to the juniper strip, younger, smaller junipers are establishing. Without disturbance it is believed that the juniper canopy cover and distribution will continue to increase causing a decrease in the health of the current understory.



South Mills Pasture (1,299 acres):

The South Mills Pasture is a seeding. The western most quarter of the pasture burned in 2006/2007. Utilization photos from 2012 show that sagebrush and other shrub canopy cover has been greatly reduced in the burned area but the crested wheatgrass plants appear to be vigorous. The 2014 production studies found that perennial grasses contributed an average of 824 lbs/acre.

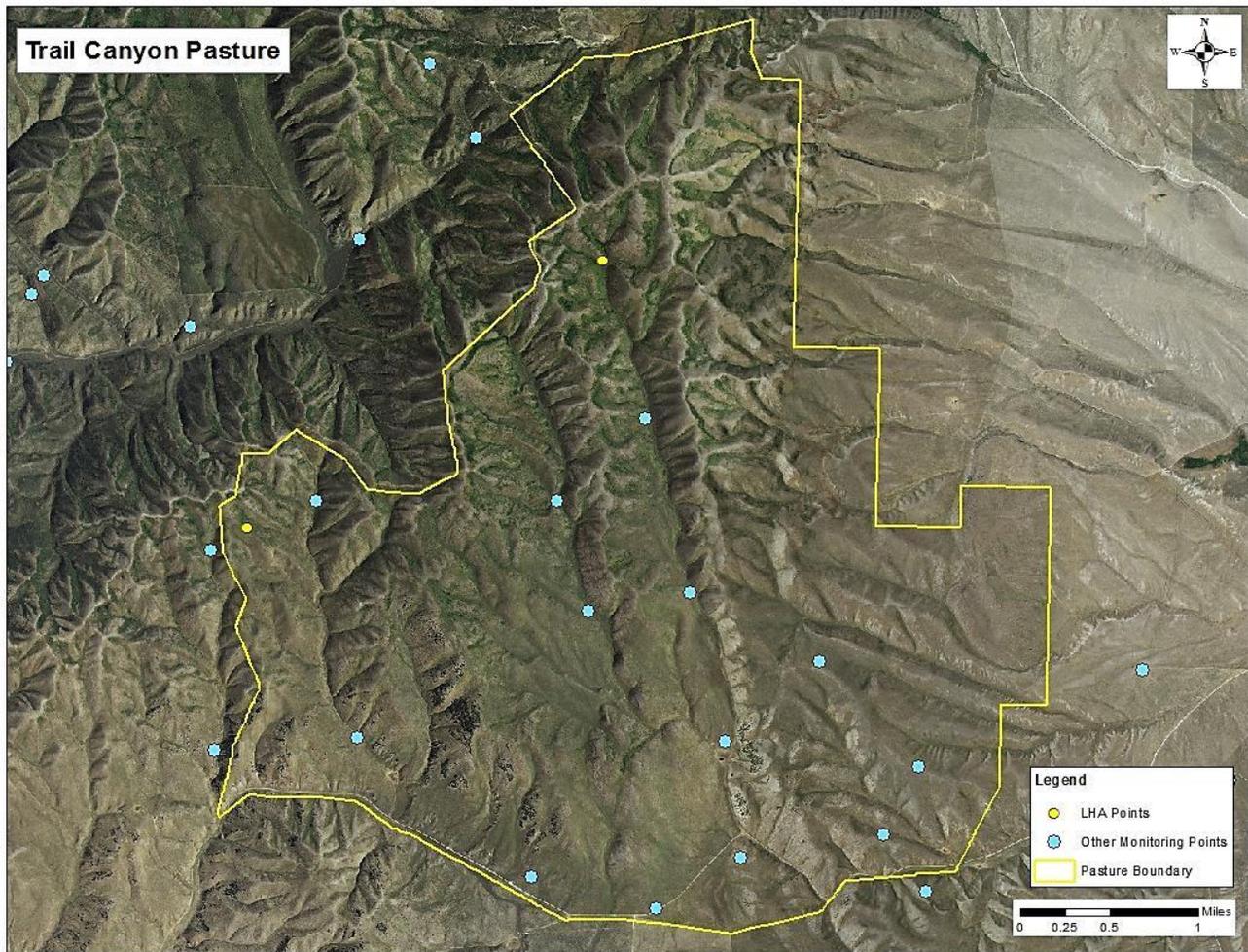
A LHA and HAF study was located within the unburnt portion of the pasture in 2013. These studies found that crested wheatgrass canopy cover was 19% and sagebrush canopy cover was 29%. The LHA noted that the bunchgrasses were smaller and more sparse than expected. It also noted that the dominant vegetative within the unburnt portion of the pasture appear to be shrubs. The dominance of the shrubs to perennial bunchgrasses and the lack of vigor of the perennial bunchgrasses found on site contributed to a moderate departure rating for the biotic integrity attribute of the LHA. The 2014 production studies found that within the unburnt portion of the pasture, perennial bunchgrasses only contributed an average of 195 lbs/acre.



Stone Pasture (1,325 acres): The Stone Pasture is predominately a seeding however some native vegetation exists in association with the juniper stands.

Native Vegetation: Based off photos and utilization studies, predominate vegetation within the native portion of the pasture includes sagebrush, junipers, and bluebunch wheatgrass. It appears that the extent of the native vegetation is extremely limited as some crested wheatgrass has been seeded within the juniper stand.

Seeding: The Stone 2 Fire in 2006 burned north of the Black Pine road. Within the burned portion of the pasture, sagebrush canopy cover decreased from approximately 8% to 0%. Aerial photography and utilization photos show that mature sagebrush is still present within the majority of the pasture south of the Black Pine road. The LHA and HAF studies conducted in 2013 occurred within the burned portion of the pasture. The studies found that the seeded species, crested wheatgrass, is healthy and abundant with a canopy cover of 27%. Utilization photos from several years confirm that crested wheatgrass within the rest of the pasture consists of large, healthy plants, which are located within the interspaces as well as under shrubs. Overall the seeding appears to be thriving.



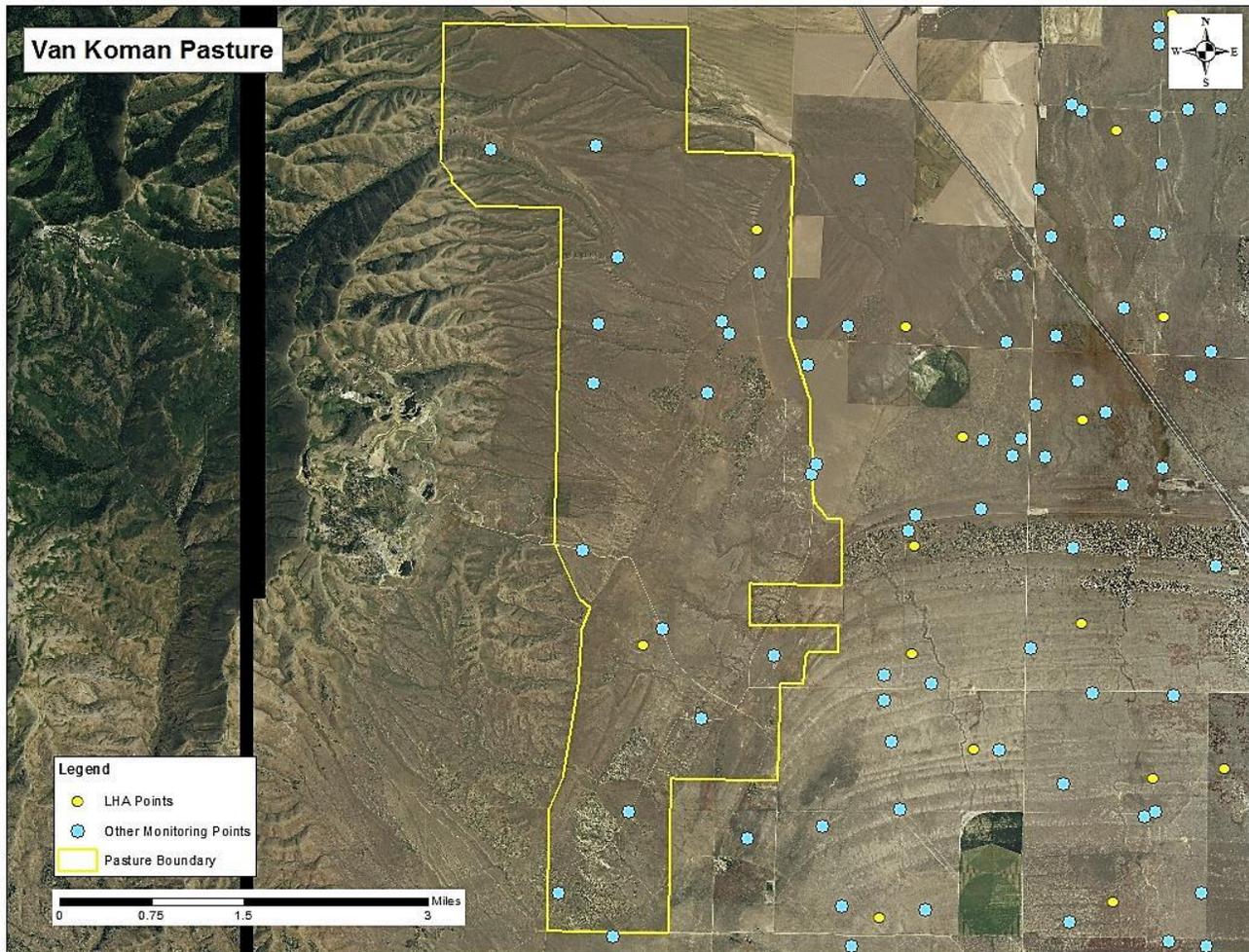
Trail Canyon Pasture (9,024 acres): The Trail Canyon Pasture is characterized by steep hills with narrow valley bottoms. The bottoms consist of a mixture of native vegetation and crested wheatgrass seedings. Utilization mapping shows that the valley bottoms and road corridors are more heavily utilized than the surrounding hillsides.

Native Vegetation: The Land Health Assessment of 2013 found that for a majority of the pasture, occurring in the Steep Slope 16-22 ARTRV/PSSP6 ecological site, was composed of a sufficient number and diversity of native grasses, perennial forbs, and other mountain shrubs to maintain ecological processes. Bluebunch wheatgrass canopy cover is around 42%. Sagebrush canopy cover was lower than expected at 1% however photos taken at the time of the assessment show large patches of mature sagebrush in the vicinity.

On the second largest soil type (Shallow Stony 12-16 ARAR8/PSSPS) sagebrush composed a greater part of the shrub canopy cover (7%). Perennial grass cover was 37% with bluebunch wheatgrass contributing 25%. Perennial forb canopy cover was 23%. However, bulbous bluegrass made up 11% of the canopy cover. Bulbous bluegrass is a weak perennial and acts much like cheatgrass by filling in the interspaces between bunchgrasses and shrubs.

Overall the native portion of the pasture shows minimal departure from what would be expected resulting in an appropriate variety of native shrubs, grasses and forbs.

Seeding: The seeded portion of the pasture is healthy. Utilization photos from 2011 and 2012 show scattered rabbitbrush, serviceberry, and sagebrush along with large, healthy crested wheatgrass plants within the seeding.



Van Koman Pasture (8,645 acres): The Van Koman Pasture is primarily comprised of a loamy ecological site and is very long extending approximately 9.4 miles north to south. Because of this, the pasture has a gradient of precipitation; receiving 8-12 inches at the southern half and 11-13 in the northern half. One LHA and HAF study site was located in the northern and southern halves of the pasture. Most of the pasture was burned in 2006 and 2007 and was subsequently aerially seeded with Basin Big Sagebrush (*Artemisia tridentata* ssp. *tridentata*).

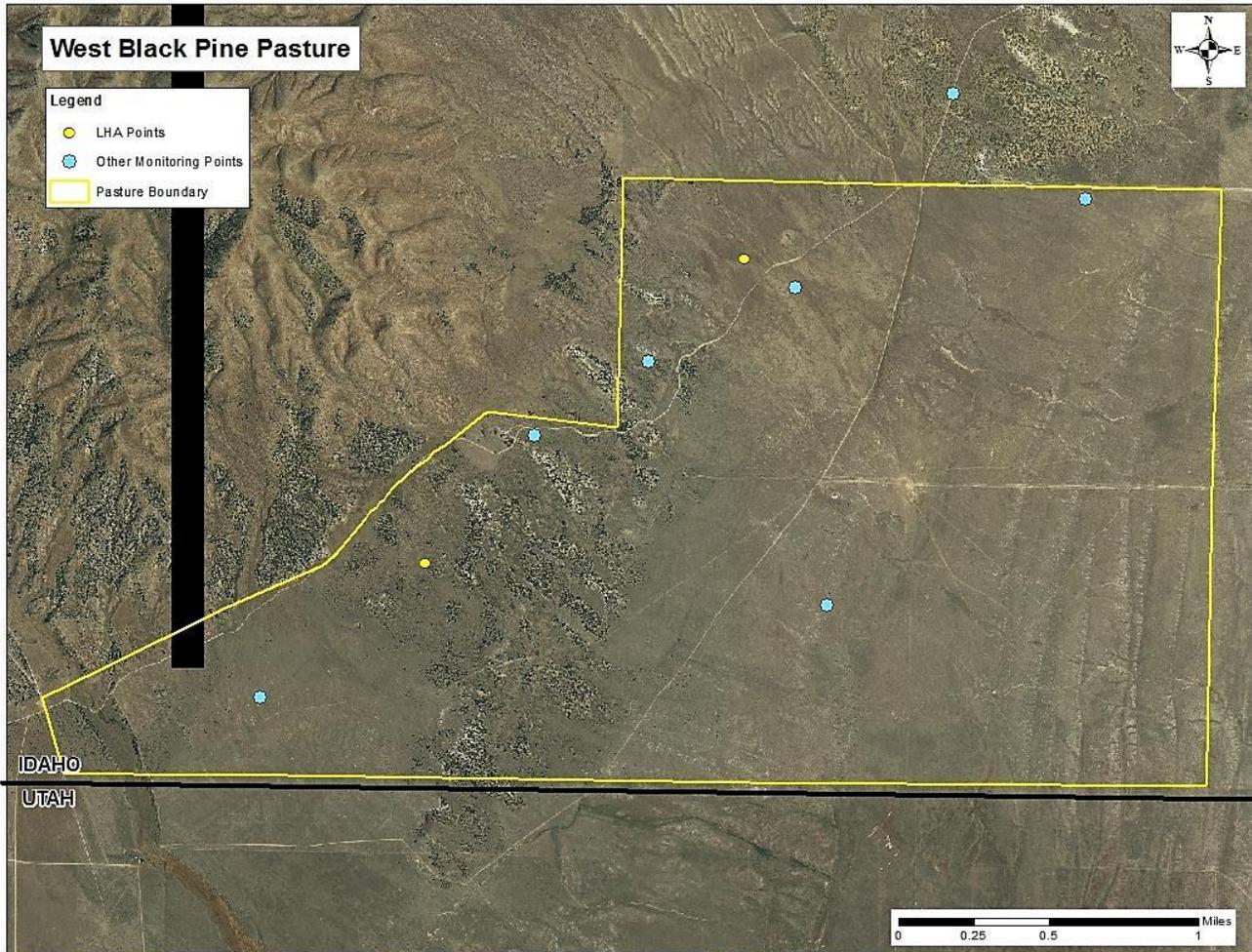
The Van Koman Pasture is comprised of both native vegetation and seedings. The native vegetation is mostly associated with slopes and juniper stands while the seedings occur on the valley bottom and on the flat benches.

Several juniper stands exist within the southern portion of the pasture. These stands are relatively young and still have some remnant shrub (sagebrush), grass and forb components. These occur adjacent to juniper stands which burned during the 2006/2007 fires. Within the burnt portion of the stand, the bluebunch wheatgrass appears to have responded well. It is expected that any thinning or removing these junipers would help restore the sagebrush/bluebunch wheatgrass community. The 2014 production studies found that perennial grasses contribute 123 lbs/acre to the forage base within these juniper stands.

Native Vegetation: According to the 2012 Utilization studies the native vegetation consists of bluebunch wheatgrass, Idaho fescue, needle and thread grass species, Indian ricegrass, arrowleaf balsamroot, rabbitbrush, and horsebrush. Cheatgrass and bulbous bluegrass were noted at almost every native vegetation sampling site. During the 2013 Land Health Assessment study at the northern site (Site ID 118) a number of native species were observed on the slopes surrounding a crested wheatgrass seeding. They included but are not limited to, Needle and Thread Grass, Great Basin wildrye, western wheatgrass, bluebunch wheatgrass, long leaf phlox, fleabane, prickly pear cactus, scarlet globe mallow, and arrowleaf balsamroot. The 2014 production studies found that perennial grasses comprise an average of 390 lbs/acre of the forage base in the northern portion of the pasture and 278 lbs/acre within the southern portion of the pasture (Appendix G; 2014 Production data).

Seeding: The crested wheatgrass seedings within the northern portion of the pasture are robust with abundant, healthy plants. The 2013 LHA and HAF studies found 44% crested wheatgrass canopy cover, 9% perennial grass canopy cover, and 20% bulbous bluegrass canopy cover. No sagebrush was encountered during the study. The abundance of bulbous bluegrass is concerning, however; the high crested wheatgrass component should help limit the potential spread of bulbous bluegrass. The 2014 production study found that perennial grasses contribute on average 652 lbs/acre to the forage base.

A Land Health Assessment conducted on the southern portion of the pasture occurred within an overlap zone between native vegetation and a seeding. It report 3% canopy cover for crested wheatgrass and 27% canopy cover for perennial grasses (13% bluebunch wheatgrass). No sagebrush was encountered during the study but the LHA noted that sagebrush seedlings were present. Photos show that both the crested wheatgrass and native perennial grasses were healthy. The 2014 production study found that perennial grasses contribute on average 474 lbs/acre to the forage base.

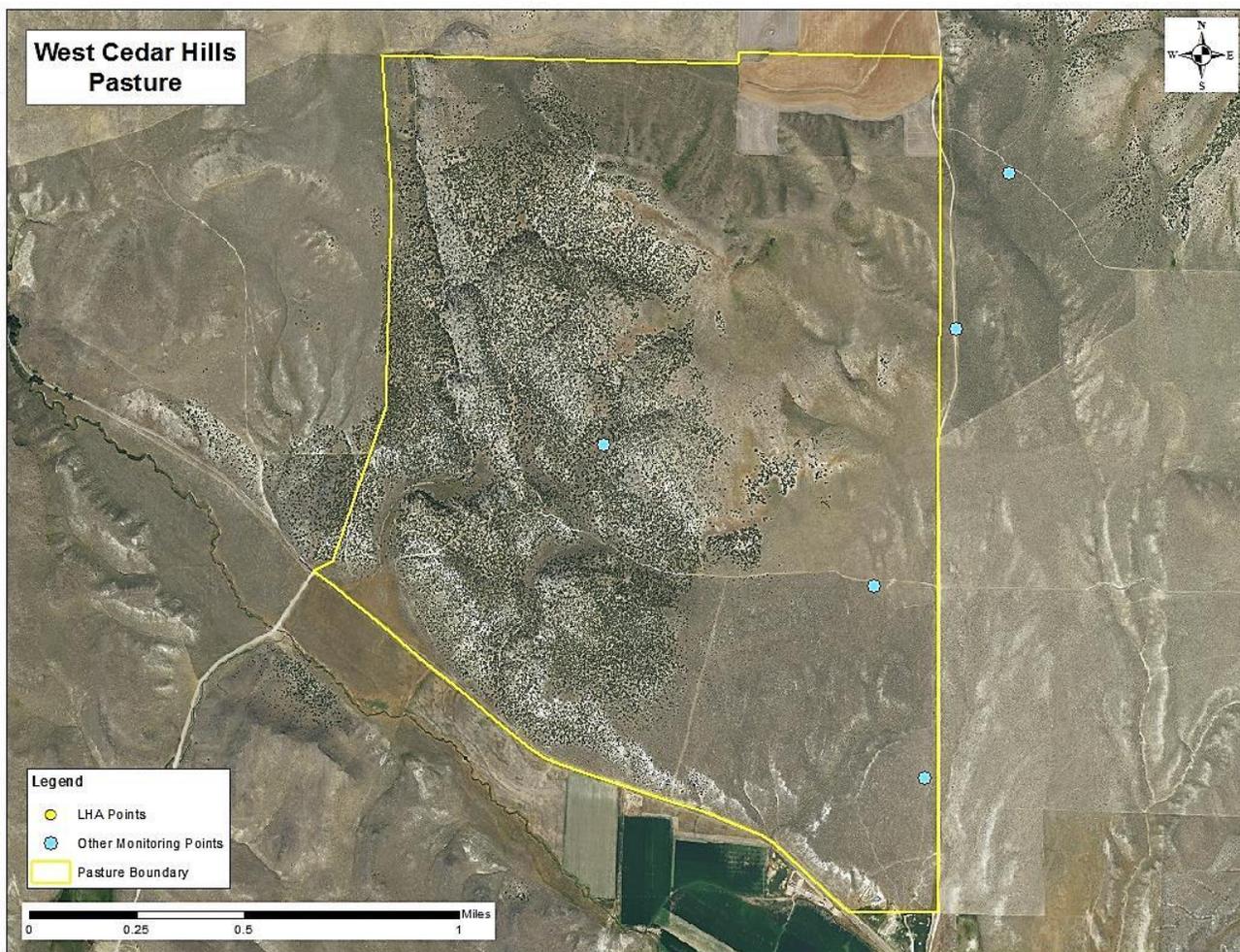


West Black Pine Pasture (3,143 acres): The West Black Pine Pasture is comprised of both native vegetation and seedlings. The native vegetation occurs predominately on the western portion of the pasture and is associated with the juniper stands. This portion of the pasture burned in the 2006/2007 fires.

Native Vegetation: Since the fires the native vegetation occurring within the Juniper Breaks 13-16 JUOS/PSSPS ecological site seems to be recovering. Perennial grasses make up 33% of the canopy cover (10% bluebunch, 21% Needle and Thread grass, 2% other). Forbs make up 4% of the canopy cover and include arrowleaf balsamroot, buckwheat species, astragalus species, desert parsley, scarlet globemallow, Indian paintbrush, long leaf phlox, and prickly pear cactus. The 2013 Land Health Assessment noted the presence of scattered sagebrush on the site as well as young junipers. The 2014 production studies found that perennial grasses contribute 85 lbs/acre to the forage base.

The native vegetation occurring on the Loamy 8-12 ARTRW8/PSSPS ecological site is also recovering following the 2006/2007 fires but does not appear to be as vigorous as that occurring within the Juniper Breaks ecological site. Perennial grass canopy cover is 18% (8% bluebunch wheatgrass, 5% Sandberg bluegrass, 3% Great Basin wildrye, and 2% Needle and thread grass) compared to 33% canopy cover in the Juniper Breaks ecological site. The diversity and abundance of perennial forbs is less within the Loamy 8-12 ARTRW8/PSSPS ecological site compared to the Juniper Breaks ecological site. Although no sagebrush was encountered during the HAF sampling, photos taken at the time of the assessment show scattered young sagebrush on the site.

Seeding: The crested wheatgrass within the seeding are abundant and healthy (utilization photos). The fires affected the western portion of the crested wheatgrass seeding. Cover transects determined that sagebrush canopy cover decreased from approximately 15% to zero following the fires. The production studies conducted in 2014 found that perennial grasses contributed 378 lbs/acre to the forage base within the burnt portion of the pasture. Within the unburnt portion of the pasture the same study found that perennial grasses contributed an average of 108 lbs/acre. Despite the low production values, utilization photos from 2011 and 2012 show that mature sagebrush is scattered throughout the unburnt portion of the seeding.

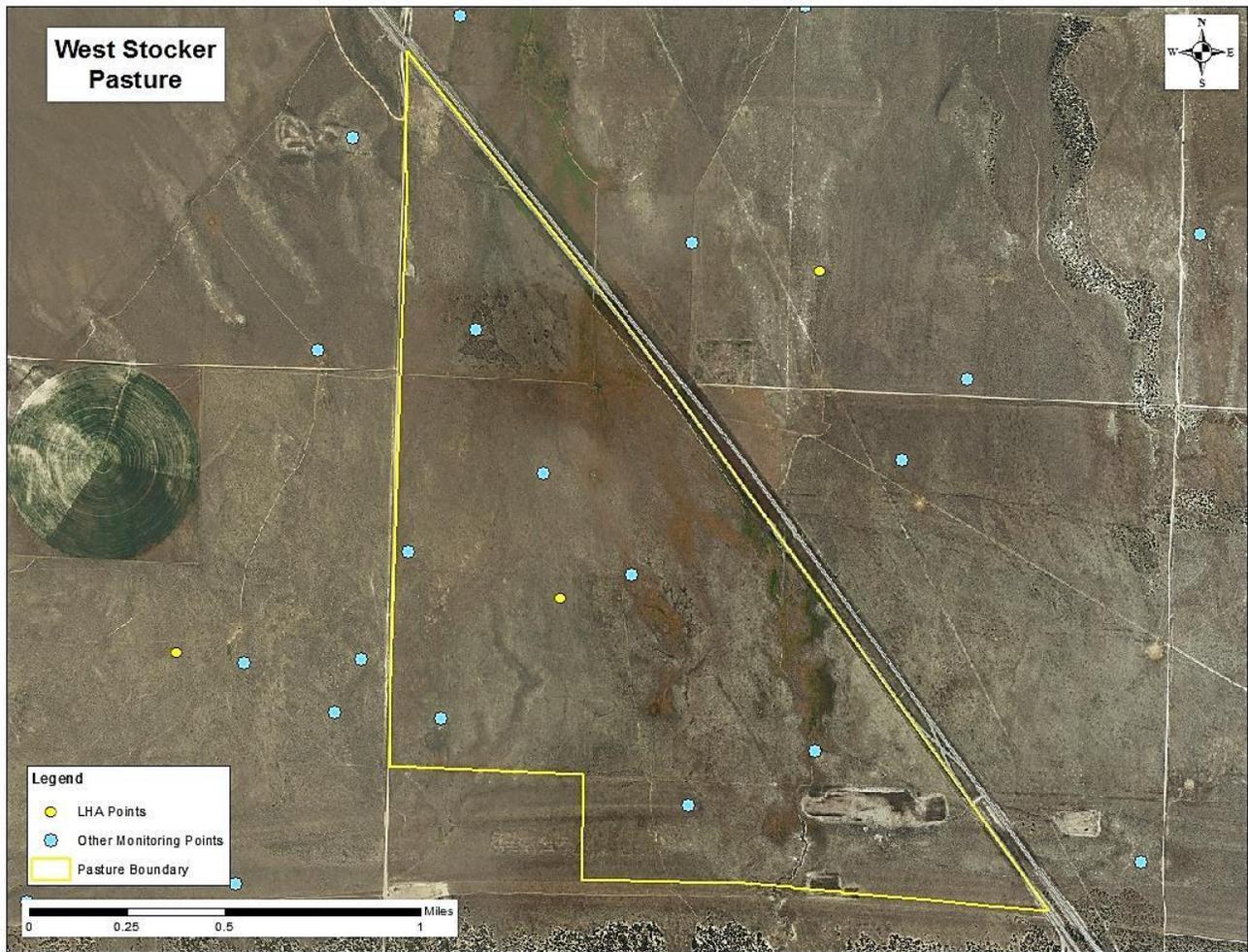


West Cedar Hills Pasture (1,449 acres): The West Cedar Hills Pasture is comprised of both native vegetation and seedings. The native vegetation is predominately associated with slopes and juniper stands on the western portion of the pasture while the seeding is located in the flat valley bottom.

Native Vegetation: Based on aerial photography the majority of the native vegetation appears to be in association with Stage II Juniper encroachment. 2010 utilization photos taken within the native vegetation show a healthy vigorous needle grass species understory and a mixture of mature and juvenile juniper over story. Some scattered sagebrush is present in the 2007 utilization photos taken near the same place as the 2010 photos. The reduction of sagebrush and bluebunch wheatgrass within the native portion of the pasture is outside the range of expected variation due to the increase in juniper competition.

Seeding: The northeast corner of the seeding within the pasture burned in 1992. Aerial photographs show scattered sagebrush throughout the crested wheatgrass seeding with a high concentration located in the southern

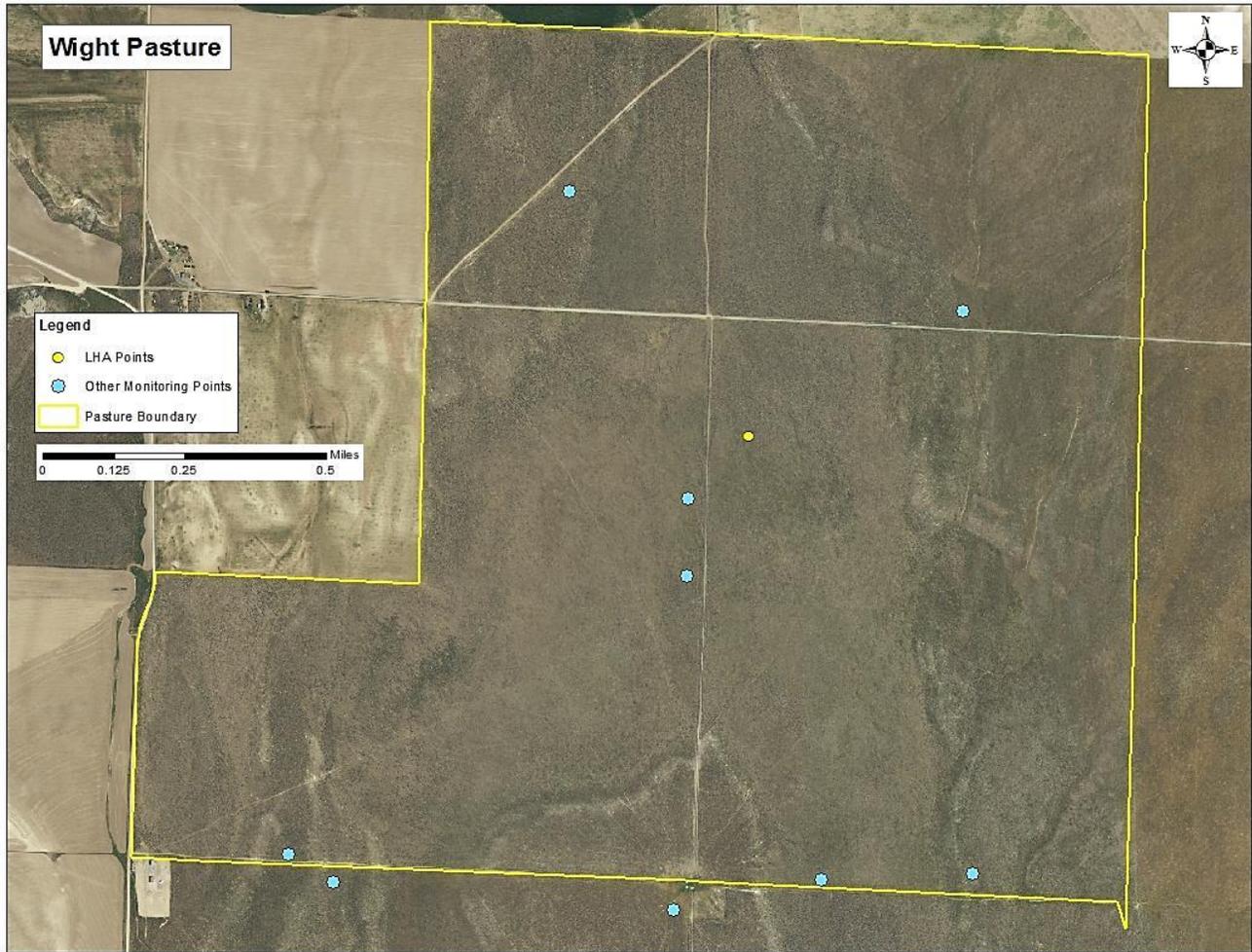
half of the pasture. Utilization photos taken in 2010 show vigorous crested wheatgrass interspersed throughout the mature sagebrush.



West Stoker Pasture (1,068 acres):

The West Stoker Pasture is a seeding with varying densities of shrubs. Within those areas with fewer shrubs, crested wheatgrass can account for up to 64% of the canopy cover, however, in areas with denser shrub cover, crested wheatgrass canopy cover is reduced and can account for as little as 5% of the canopy cover. The LHA conducted in 2013 occurred within an area of high shrub densities and found that the biotic integrity attribute was moderately departed from what would be expected. It noted that the crested wheatgrass plants surveyed exhibited low productivity and vigor and that the annual bur buttercup was common throughout the site. It also appears from the photos that few crested wheatgrass plants occur within the interspaces.

Though some pockets of productive crested wheatgrass occur within the pasture, the majority of the pasture contains high densities of shrubs, and stunted crested wheatgrass plants.



Wight Pasture (1,376 acres):

The Wight Pasture is a seeding. The eastern half of the pasture burned during the fires of 2006/2007. Utilization photos from 2012 show that shrubs are uncommon within the burned area and it appears that the crested wheatgrass plants have greater vigor than those within the unburnt portion of the pasture. LHA and HAF studies were conducted within the unburnt portion of the pasture in 2013. These studies found that the area contained all of the structural/functional groups that would be expected within a seeding. Sagebrush canopy cover is 19%. Despite having less robust crested wheatgrass plants than the burned area, the unburned area maintains an adequate abundance of crested wheatgrass with plants located in both the interspaces and beneath shrubs. For this reason the biotic integrity attribute was rated as a slight to moderate departure from what would be expected.

C. Special Status Plants

A BLM sensitive plant species, the mountain ball cactus (*Pediocactus simpsonii*), also known as Simpson’s hedgehog cactus, occurs in at least five populations on the thin rocky soils of ridge tops and mountains of the Trail Canyon Cow Hollow and Crazy Canyon pastures of the Evaluation area. The populations appear to be maintaining themselves and do not appear to be impacted by livestock.

D. Soils

There are over 50 different soil series within the Evaluation Area (Figure 3.1). The majority of the flat to rolling lowland areas are composed of Araveton (silt loam), Darkbull (loam), Ecur (sandy loam), Hutchley

(gravelly loam), and McCarey (silt loam). These form along fan remnants and are derived from mixed alluvium; they tend to be very deep (i.e. > 39 inches to a restrictive layer or bedrock) and well-drained.

The mountainous, steep slope areas are composed of Hondoho (gravelly silt loam), Hymas (very cobbly loam), and Ridgecrest (gravelly silt loam). These soils also occur along fan remnants and being composed of alluvium and colluvium, tend to be moderately to very deep; except for Hymas which is shallow (< 11 inches) and all are well-drained.

Dominant soil classifications across the Evaluation Area are presented in (Table 3.4); based on soil classification by the USDA, Natural Resources Conservation Service (NRCS), and Soil Survey Geographic Database (SSURGO NRCS 2010). A description of mapped soil unit (MUSYM) can be found at the aforementioned site.

Figure 3.5: Soils within the Evaluation Area.

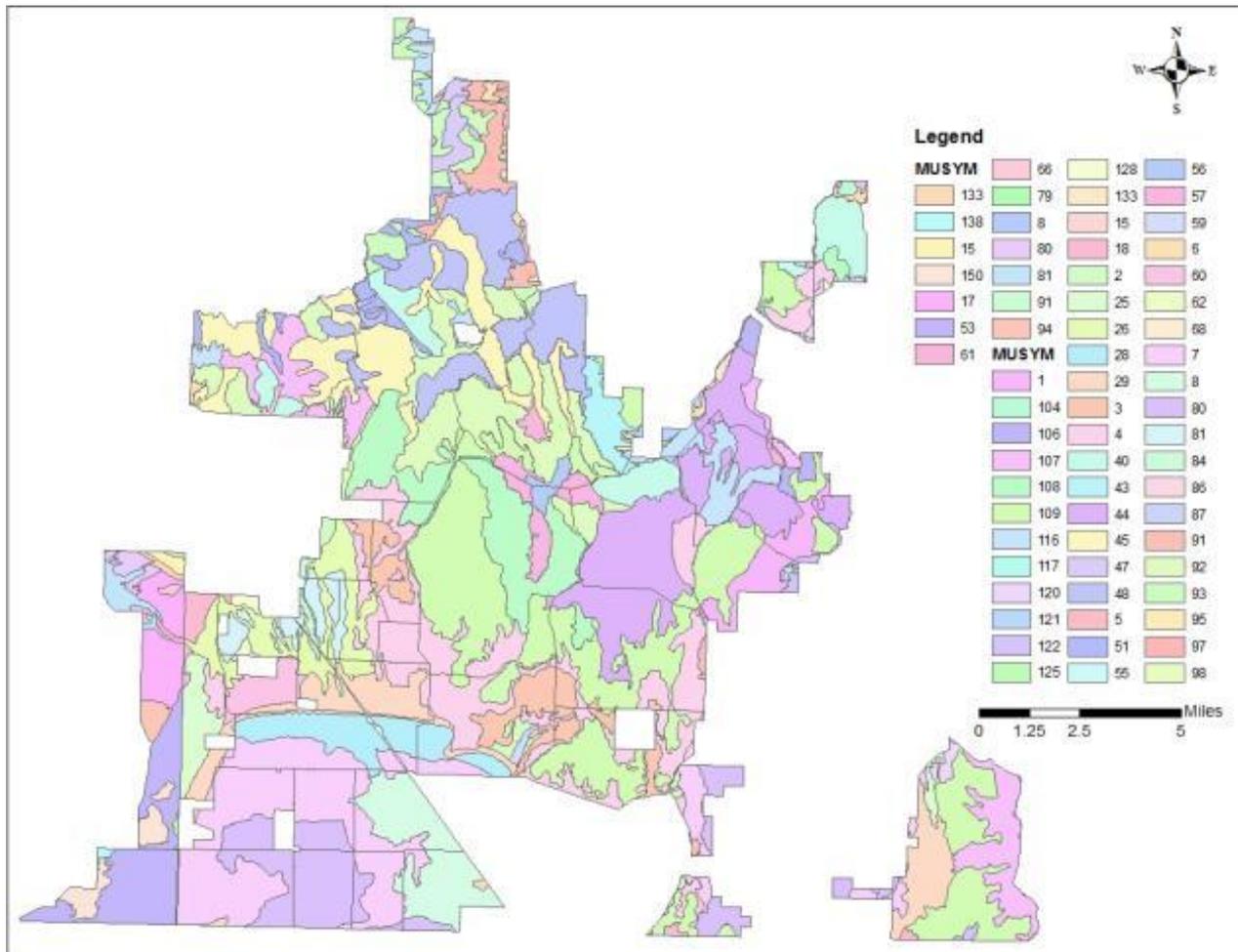


Table 3.4: Soils of the Evaluation Area by MUSYM, Ecological Site and acres

| Oneida County | | | | | | | | |
|---------------|-----------------|--------|-------|-----------------|-------|-------|-----------------|--------|
| MUSYM | Ecological Site | Acres | MUSYM | Ecological Site | Acres | MUSYM | Ecological Site | Acres |
| 1 | Undefined | 1,753 | 47 | Shallow Stony | 939 | 95 | Loamy | 73 |
| 2 | Undefined | 486 | 48 | Shallow Stony | 6,341 | 97 | Loamy | 69 |
| 3 | Undefined | 3,345 | 51 | Steep Slope | 1,315 | 98 | Loamy | 18 |
| 4 | Loamy | 11,048 | 55 | Loamy Bottom | 15 | 104 | Undefined | 95 |
| 5 | Undefined | 320 | 56 | Loamy | 406 | 106 | Steep Slope | 550 |
| 6 | Undefined | 520 | 57 | Loamy | 1,632 | 107 | Steep Slope | 4,561 |
| 7 | Loamy | 10,854 | 59 | Undefined | 142 | 108 | Steep Slope | 6,189 |
| 8 | Loamy | 3,800 | 60 | Undefined | 1,083 | 109 | Steep Slope | 18,799 |
| 15 | Undefined | 23 | 62 | Sand | 23 | 116 | Undefined | 2,552 |
| 18 | Gravelly Loam | 623 | 68 | Undefined | 3 | 117 | Loamy | 55 |
| 25 | Loamy | 1,523 | 80 | Alkali | 5,836 | 120 | Loamy | 384 |
| 26 | Loamy | 3,763 | 81 | Loamy | 1,509 | 121 | Loamy | 148 |
| 28 | Sandy | 3,015 | 84 | Undefined | 243 | 122 | Loamy | 336 |
| 29 | Loamy | 4,605 | 86 | Loamy | 6 | 125 | Undefined | 45 |
| 40 | Steep Slope | 3,844 | 87 | Undefined | 20 | 128 | Loamy | 217 |
| 43 | Loamy | 1,194 | 91 | Loamy | 1,523 | 133 | Stony Loam | 101 |
| 44 | Loamy | 9,223 | 92 | Steep Slope | 6,963 | | | |
| 45 | Steep Slope | 6,793 | 93 | Steep Slope | 2,010 | | | |

| Cassia County | | | | | | | | |
|---------------|-----------------|-------|-------|-----------------|-------|-------|-----------------|-------|
| MUSYM | Ecological Site | Acres | MUSYM | Ecological Site | Acres | MUSYM | Ecological Site | Acres |
| 8 | Steep South | 2 | 66 | Alkali | 65 | 80 | Steep South | 494 |
| 15 | Loamy | 163 | 79 | Loamy | 44 | 81 | Steep South | 621 |
| 17 | Stony Loam | 1,797 | 133 | Steep South | 115 | 91 | Loamy Bottom | 32 |
| 53 | Undefined | 3,890 | 138 | Loamy | 62 | 94 | Stony Loam | 330 |
| 61 | Loamy | 75 | 150 | Fine Sandy Loam | 916 | | | |

Table 3.5: General soil types and percentage of the evaluation area.

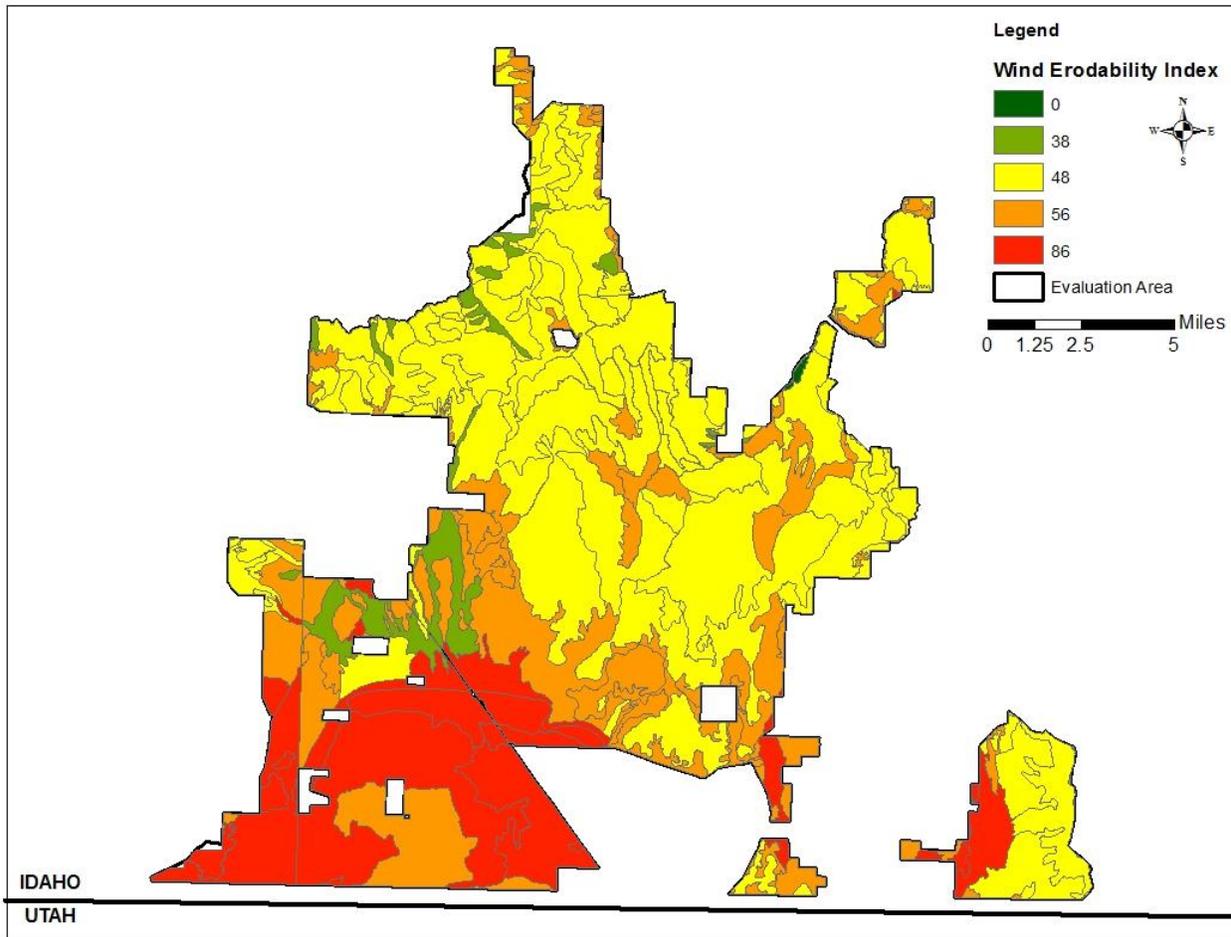
| General Soil Type | Acres | Percent of Evaluation Area |
|-------------------|--------|----------------------------|
| Alkali | 5,901 | 4 |
| Gravelly Loam | 623 | ≤ 1 |
| Fine Sandy Loam | 916 | ≤ 1 |
| Loamy | 52,730 | 43 |
| Loamy Bottoms | 47 | ≤ 1 |
| Sand | 23 | ≤ 1 |
| Sandy | 3,015 | 2 |
| Shallow Stony | 7,280 | 5 |
| Steep Slopes | 52,256 | 38 |
| Undefined | 14,520 | 6 |

Loams and steep slopes are the dominant soil types within the evaluation area totaling 81%. Loams dominate on the lowlands, flats, and the rolling foothill areas. Steep slopes dominate on the mountainous areas. Alkali

flats occur near the Utah border and make up approximately 5,901 acres within the lowest areas receiving 6-8” precipitation a year. In addition, based on field recognizance it is estimated that there are several areas that are mapped as loam near the Utah boarder that have a moderate to high component of Alkali soils intermixed. Gravelly, loams occur at the northwest portion of the Evaluation Area. Juniper Breaks (Fine Sandy Loam) occur on rock outcrops, while the sand and sandy sites occur as a band and support the juniper stand that may have been the ancient shoreline of Lake Bonneville. Shallow stony sites occur in the northeast mountainous portions of the Evaluation Area. Six percent of the Evaluation Area has undefined mapping units.

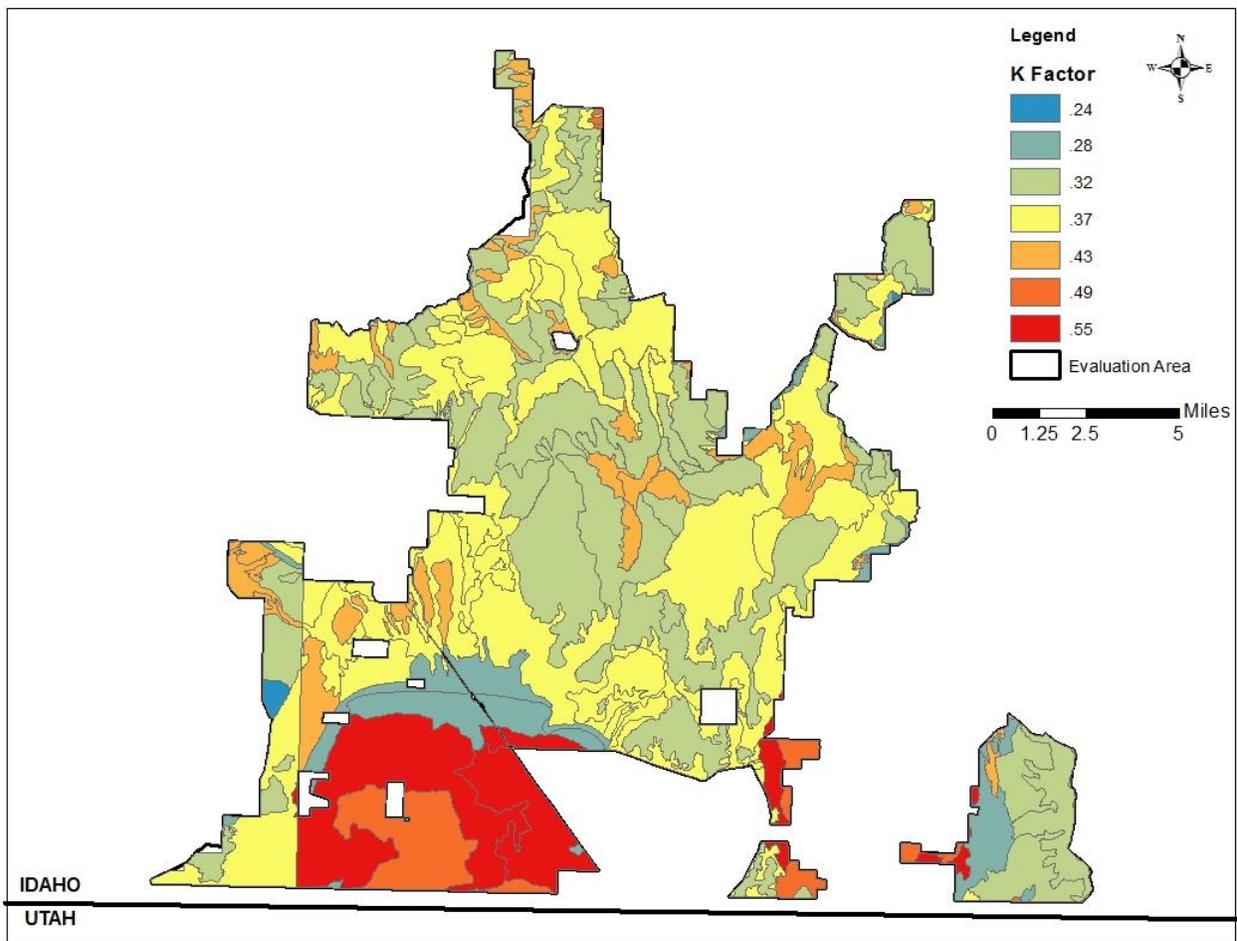
The Wind Erodibility Index is a value indicating the susceptibility of soil to wind erosion in tons per acre per year. The greatest susceptibility occurs within the southwest corner of the evaluation area. This area corresponds primarily to three ecological sites; Alkali Flats 8-12 ATCO/ELEL5, Loamy 8-11 ARTRT/PSSP6, and Loamy 8-12 ARARW8/PSSP6, which are described in more detail in Section B; Vegetation.

Figure 3.6: Wind Erodability Index map



The K factor is an index quantifying the relative susceptibility of a soil to sheet or rill erosion. The lower the K factor, the more stable and less susceptible a soil is to erosion. Within the evaluation area, the greatest K factors occur west of Interstate 86, within the Bayhook silt loam, 0-2% slopes (MUSYM 7), the Bayhook-Ecur Complex, 0-4% slopes (MUSYM. 8), and the Mellor-Freedom Complex, 0-2% slopes (MUSYM 80). This is consistent with the area most susceptible to wind erosion depicted in Figure 3.6.

Figure 3.7: K Factor map



According to the Land Health Evaluation conducted in 2013, litter cover ranged from 55% to 67% throughout the seeded area and between 42% and 63% within the native vegetation area (Appendix F, Table F-6 and F-7). This amount of litter cover exceeds what would be expected for all ecological site descriptions found within the evaluation area. This increased litter aids in the protection of the soil surface to rain drop impact and in infiltration. Within the evaluation area, fires have reduced the shrub canopy cover. For a small portion of the evaluation area, this reduction in shrub canopy cover has led to decreased snow capture which is greater than what would be expected.

Soil stability tests were performed in conjunction with the Land Health Evaluation and HAF data collection. According to these tests, Soil stability within the seeded portions of the evaluation area tended to be within the expected range of variation or just below what would be expected. Within the native portion of the evaluation area the soil stability test also tended to be within the expected range of variation or just below what would be expected. No current ecological site descriptions were available for the Sandy 8-12 JUOS/ARTRT/ACHY or Shallow Stony 12-16 ARAR8/PSSP6 ecological sites. Therefore expected ranges for soil stability are unknown; however, both ecological sites have soil stabilities rates above 3.5 on a 6.0 scale and are believed to be stable.

Table 3.6: Summary of Soil Stability Test within seeded areas for each ecological site.

| Ecological Site (Seeded Areas) | Number of Plots | ESD Expected Value | High Value | Low Value | Average |
|--------------------------------|-----------------|--------------------|------------|-----------|---------|
| Alkali Flat | 7 | 3.5- 5 | 4.6 | 2.2 | 3.6 |
| Loamy 11-13 ARTRT/PSSP6 | 9 | 4 -6 | 4.5 | 1.8 | 3.7 |
| Loamy 13-16 ARTRV/PSSP6 | 6 | 4 -6 | 4.7 | 1.8 | 3.3 |
| Loamy 8-11 ARTRT/PSSP6 | 13 | 2 -4 | 5.5 | 1.8 | 3.6 |
| Loamy 8-12 ARTRW8/PSSP6 | 1 | 4 -6 | ** | ** | 1.9 |

Table 3.7: Summary of Soil Stability Test within native vegetation areas for each ecological site.

| Ecological Site (Native Areas) | Number of Plots | ESD Expected Value | High Value | Low Value | Average |
|------------------------------------|-----------------|--------------------|------------|-----------|---------|
| Juniper Breaks | 1 | 1-2 | ** | ** | 3.7 |
| Loamy 13-16 ARTRV/PSSP6 | 4 | 4 -6 | 4.6 | 1.6 | 3.7 |
| Loamy 16-22 ARTRV/PSSP6 | 1 | 4 -6 | ** | ** | 5.7 |
| Loamy 8-12 ARTRW8/PSSP6 | 1 | 4 -6 | ** | ** | 3.1 |
| Sandy 8-12 JUOS/ARTRT/ACHY | 2 | | 4.3 | 4.9 | 4.6 |
| Shallow Stony 12-16 ARAR8/PSSP6 | 2 | | 4.4 | 2.9 | 3.7 |
| Steep Slope 16-22 ARTRV/PSSP6 | 8 | 4 -6 | 5 | 2.4 | 3.8 |

Within the seedings the soil stability is slightly less than what would be expected for the majority of the ecological sites, however, the abundance of litter and vegetative cover is adequate to protect the soil surface from erosion. Within the native vegetative areas the soil stability is greater than expected within the Juniper Breaks and Loamy 16-22 ARTRV/PSSP6 ecological sites, and only slightly less than expected within the other four/five ecological sites. As with the seeded areas, cover data collected in 2013 demonstrates that there is ample litter and vegetative cover to protect the soil surface.

Soils are generally stable with a few isolated instances of accelerated erosion. The areas affected by erosion are limited in size, and associated with steep slopes, roads, and recent fire activity. There are also limited areas impacted by livestock, such as around watering points or loafing areas, where livestock congregate that result in increased soil compaction and removal of protective vegetative cover. These isolated impacts result in the breakdown of the soil surface leaving powdery soil surface conditions temporarily susceptible to wind erosion. During the Land Health Assessment some movement of surface fines, water flow patterns and pedestalling were observed. However, in general, soils across the evaluation area have sufficient vegetative cover to protect soils and watershed stability in both the upland, native plant communities, and in the rangeland seedings. There is minimal evidence of accelerated erosion within the Evaluation Area. In addition, it is assumed that those lands obtained through the Bankhead Jones Act were manipulated in the past through agricultural practices and later the drill seeding of crested wheatgrass. This probably disturbed the upper soil horizon and may have led to a decrease in organic matter.

E. Water Quality (Surface and Ground)

The Idaho Department of Environmental Quality (IDEQ) has listed 13 reaches within the evaluation area (Figure 3.6) as impaired waters (Table 3.8). Impairment of water quality is due to low flow alterations, physical substrate habitat alteration, sedimentation, siltation and/or fecal coliform bacteria, depending upon reach. Soil erosion, sedimentation and siltation, may or may not be associated with livestock, however, livestock, along

with wildlife, are known to remove the protective vegetative cover, trample soils (compaction), hoof-shear streambanks and are one source of fecal coliform.

The 2010 Idaho DEQ Integrated Report determined that the majority of stream reaches in the Curlew Valley subbasin are Dry Intermittent, with zero water flow during at least one week of the year (Beneficial Use Reconnaissance Program). The Curlew Valley subbasin is HUC #16020309; a map of impaired waters can be found at the Environmental Protection Agency Web Page:

http://iaspub.epa.gov/tmdl_waters10/attains_waterbody.control?p_list_id=ID16020309BR001_03&p_cycle=2010&p_state=ID&p_report_type=T

Figure 3.8: 303 (D) listed streams within the evaluation area.

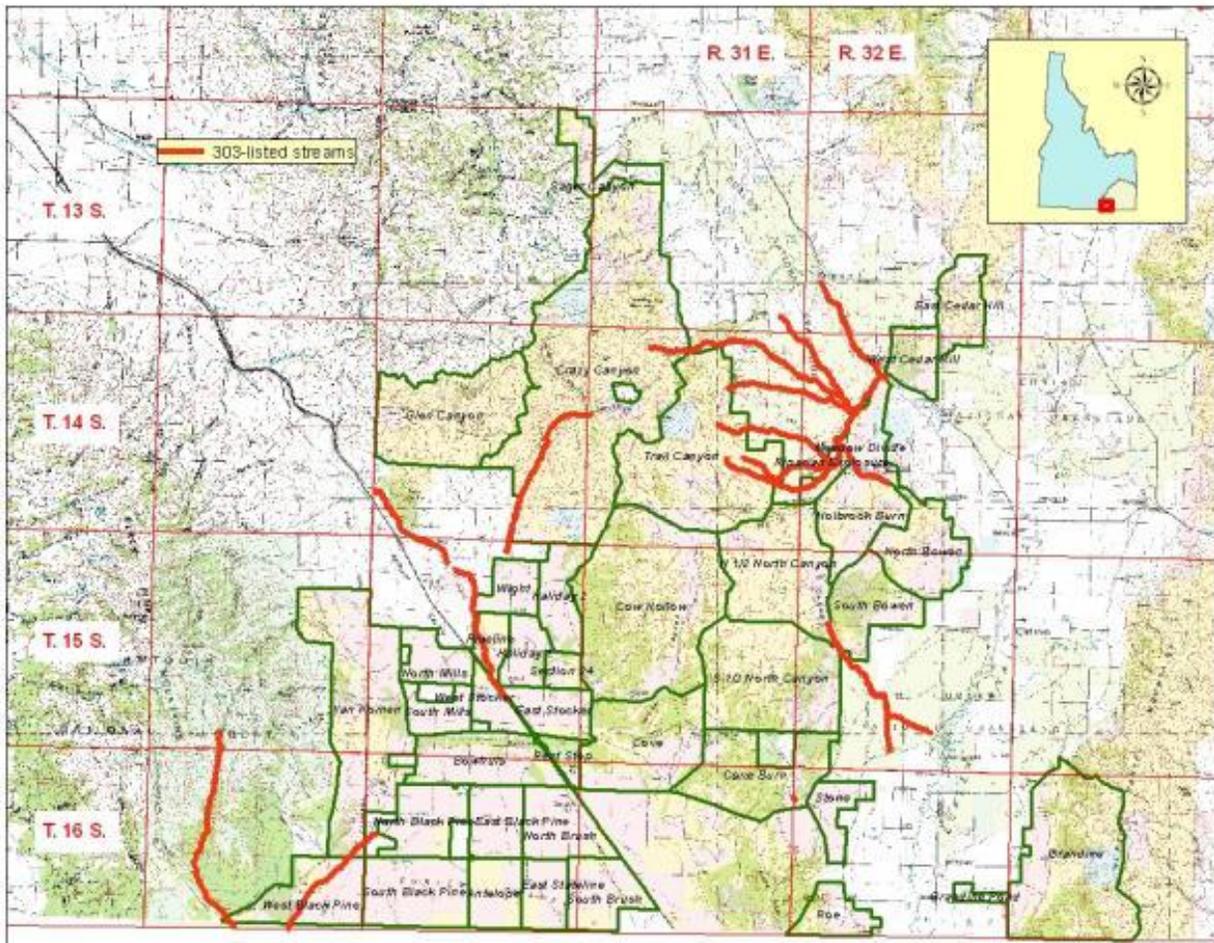


Table 3.8: 303(d)-listed streams/reaches on public lands within the evaluation area.

| Stream/Spring Name | Stream Reach/Type | Pasture |
|--------------------|-------------------|---------------------|
| Josephson Spring | Dry Intermittent | Holbrook Burn |
| Meadow Brook Creek | Perennial | Meadow Brook Divide |
| North Canyon Creek | Perennial | North Canyon |
| Hay Canyon Creek | Dry Intermittent | Crazy Canyon |
| Unnamed Creek | Dry Intermittent | Pipeline |
| Unnamed Creek | Dry Intermittent | Meadow Brook Divide |
| Unnamed Creek 1 | Dry Intermittent | Trail Canyon |
| Unnamed Creek 2 | Dry Intermittent | Trail Canyon |
| Unnamed Creek 3 | Dry Intermittent | Trail Canyon |
| Unnamed Creek 4 | Dry Intermittent | Trail Canyon |
| Abandoned Ditch | Dry Intermittent | West Black Pine |

i. Intermittent Streams.

Most streams within the evaluation area are dry for months and only run intermittently along short runs with no outlet where the surface waters eventually soak back into the soil. Only Meadow Brook, which flows into Rock Creek, and North Canyon Creek, which flows into Deep Creek, have substantial perennial reaches that flow to waters further downstream. These riparian areas are fenced from livestock and no impacts to water quality occur from these sources. The other 303(d)-listed reaches are intermittent and pose no water quality threats to the watershed; they have no potential of producing sedimentation or siltation, except locally during short-lived precipitation events.

ii. Ground water

The Black Pine well (T16S R30E, NW/4 NE/4 Sec. 09) draws from an aquifer that is fed by groundwater, which lies underneath a number of abandoned, hard-rock mines on the eastern slopes of Black Pine Mountain. This groundwater has the potential of being contaminated. The IDEQ annually samples water from the Black Pine well to monitor its safety and to test for the presence of heavy metals and toxic or hazardous contaminants. To date there have been no negative results.

There other 10 wells within the evaluation area were not sampled for water quality. However, the water is pumped from subsurface sources and delivered to troughs for livestock use. It is assumed that there is no quality issues associated with these wells.

iii. Springs

Water from the springs within the evaluation area is captured subsurface and piped to troughs for livestock use. These springs are not tested for water quality; however, it is assumed that they are not contaminated. The springs are covered in greater depth under Section III, Existing Resources, subsection F, Wetland and Riparian Zones.

F. Wetland and Riparian Zones

There are 16 springs located within the evaluation area that have been developed to provide water for livestock (Table 3.9) but only six of these are considered to have riparian areas associated with them. The condition of springs and surface waters were assessed in 2000/2002 and 2011 using a riparian checklist (BLM 1998). Surface waters were classified as properly functioning condition (PFC), functional-at-risk (FAR), or nonfunctional (NF) where PFC would be the only condition to meet Standard 2 (riparian areas and wetlands) and Standard 3 (stream channels and floodplains) under Idaho Standards for Rangeland Health (BLM 1997).

The 2000/2002 riparian assessments did not follow the Technical Reference (TR 1737-15 1998) protocol: so only the photos and field notes were used for this assessment. In 2011, riparian assessments were conducted on the artificially created riparian areas created from the overflow of water out of the trough and not at the individual spring sources. Developed springs with no surface water and/or riparian vegetation should not have been assessed using the PFC method. Bench, Black Pine, and Josephson springs are open systems where water from the spring is piped to troughs and then overflows onto the ground nearby. Riparian vegetation has developed within these artificial riparian areas. However, it is recognized that the development of these springs may be causing the lack of surface water and associated riparian vegetation at the source.

Table 3.9: PFC evaluations of Springs within the evaluation area.

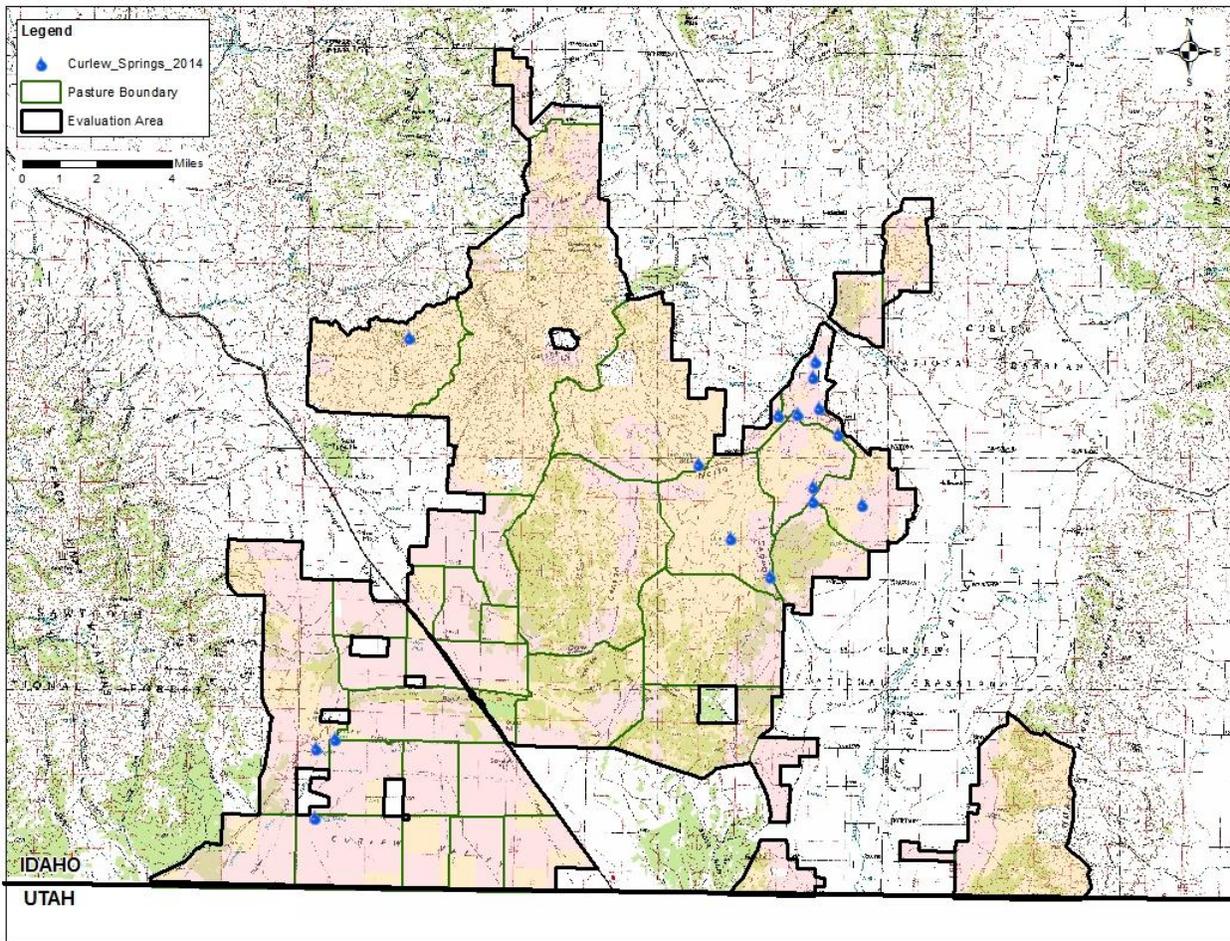
| Spring Name | Surface Water | 2002 PFC | | 2011 PFC | |
|--------------------------|---------------|----------|---------------|----------|---------------|
| | | Rating * | Trend | Rating * | Trend |
| Holbrook (enclosure) | stream | FAR | <i>upward</i> | FAR | <i>upward</i> |
| Little Rock (enclosure) | stream | NF | — | NF | — |
| Lost | seep | NF | — | NF | — |
| Meadow Brook | stream | FAR | <i>upward</i> | PFC | — |
| North Canyon (enclosure) | stream | FAR | <i>upward</i> | FAR | <i>upward</i> |
| Rose (enclosure) | seep | FAR | <i>upward</i> | FAR | — |
| Willow (enclosure) | seep | FAR | <i>upward</i> | FAR | — |

* FAR = functional-at-risk; NF = non-functional; PFC = proper functioning condition ** No data

In 2011, ten springs were assessed using a checklist that evaluated 17 indicators of watershed health (e. g. hydrology, vegetation and soil erosion of the riparian/wetland area) and rated functioning condition; see: photos Appendix C.

Typically surface waters derived from overflows from springs and/or troughs overflows into nearby surface depressions and form weakly developed, shallow channels in which the surface soils become saturated and support plant growth, which may or may not include riparian species. Plant communities immediately adjacent to these channels are not affected by the surface water and may be dormant due to the lack of soil water to support growth, even when the saturated area is green. These shallow channels have relatively short lengths, e.g. approximately 50 ft. at Black Pine spring, and 200 – 300 ft. at Bench spring.

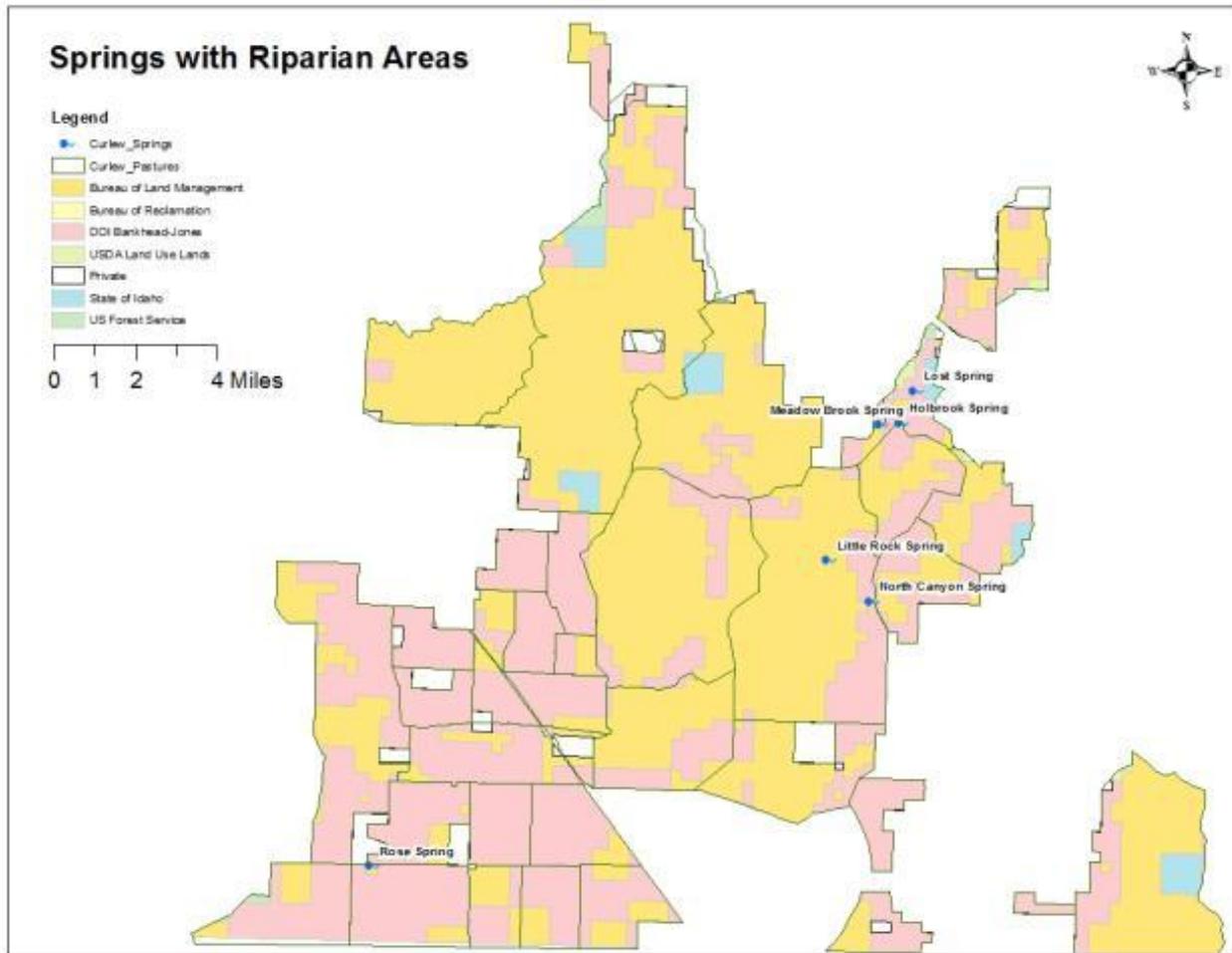
Figure 3.9: Spring locations within the evaluation area.



i. Springs with Riparian Areas

Meadow Brook and North Canyon creeks are fenced to exclude livestock and have well-developed riparian areas and substantial perennial reaches that flow outside the evaluation area. Holbrook, Lost, Rose and Little Rock creeks have poorly-developed riparian areas with stream reaches that may extend 1000 ft or more but do not connect to perennial streams. These four springs constitute the riparian areas evaluated for Standard 2 (Riparian Area and Wetland). Meadow Brook and North Canyon stream channels are evaluated for Standard 3 (Stream Channel and Floodplain).

Figure 3.10: Springs with riparian areas within the evaluation area.



Holbrook spring in the Meadow Brook pasture has a fence that encloses about 0.4 acres. Holbrook Creek is intermittent. The riparian area is incised deep enough that there is not much flood plain development or livestock use on the channel bottom; the site is well watered. Nebraska sedge and woody species such as *Rosa* and *Prunus* species, are present. The riparian area extends at least ¼ mile below Holbrook spring. Holbrook spring (Table 3.9) rated FAR with an upward trend; Appendix C.

Little Rock spring in the North Canyon pasture is located inside a 5 acre enclosure built in 2003. Little Rock Creek is intermittent. In 2011, during a fall assessment, a number of sections of the fence were down and there was heavy cattle use inside the enclosure. The spring rated NF in 2011 due to livestock intrusion, otherwise it would have rated FAR; Appendix C.

Lost spring in the Meadow Brook Divide pasture is a developed spring with an open system. Water is collected in a headbox and piped to a trough downslope of the spring. The overflow is piped into a wildlife enclosure. The spring itself has an enclosure fence; the only surface water is inside the enclosure. A few Nebraska sedge plants occur outside the enclosure. Lost spring rated NF with no apparent trend in 2011; Appendix C.

Meadow Brook spring in Meadow Brook pasture has a fence that encloses a 101 acre riparian area. Meadow Brook Creek is perennial. The riparian area is well vegetated (willow, sedges, rushes, cattails) and extends about 4800 ft. down the natural drainage onto the Forest Service Grasslands. In 2011, it rated PFC with an upward trend; Appendix C.

North Canyon spring in North Canyon pasture is located within a 130 acre riparian enclosure, about 1 mile in length. North Canyon Creek is intermittent. The riparian area is well vegetated (e. g. willow, sedges, rushes, and cattails); water is turbid and carries some sediment. In 2011, it rated very high FAR, close to PFC; Appendix C.

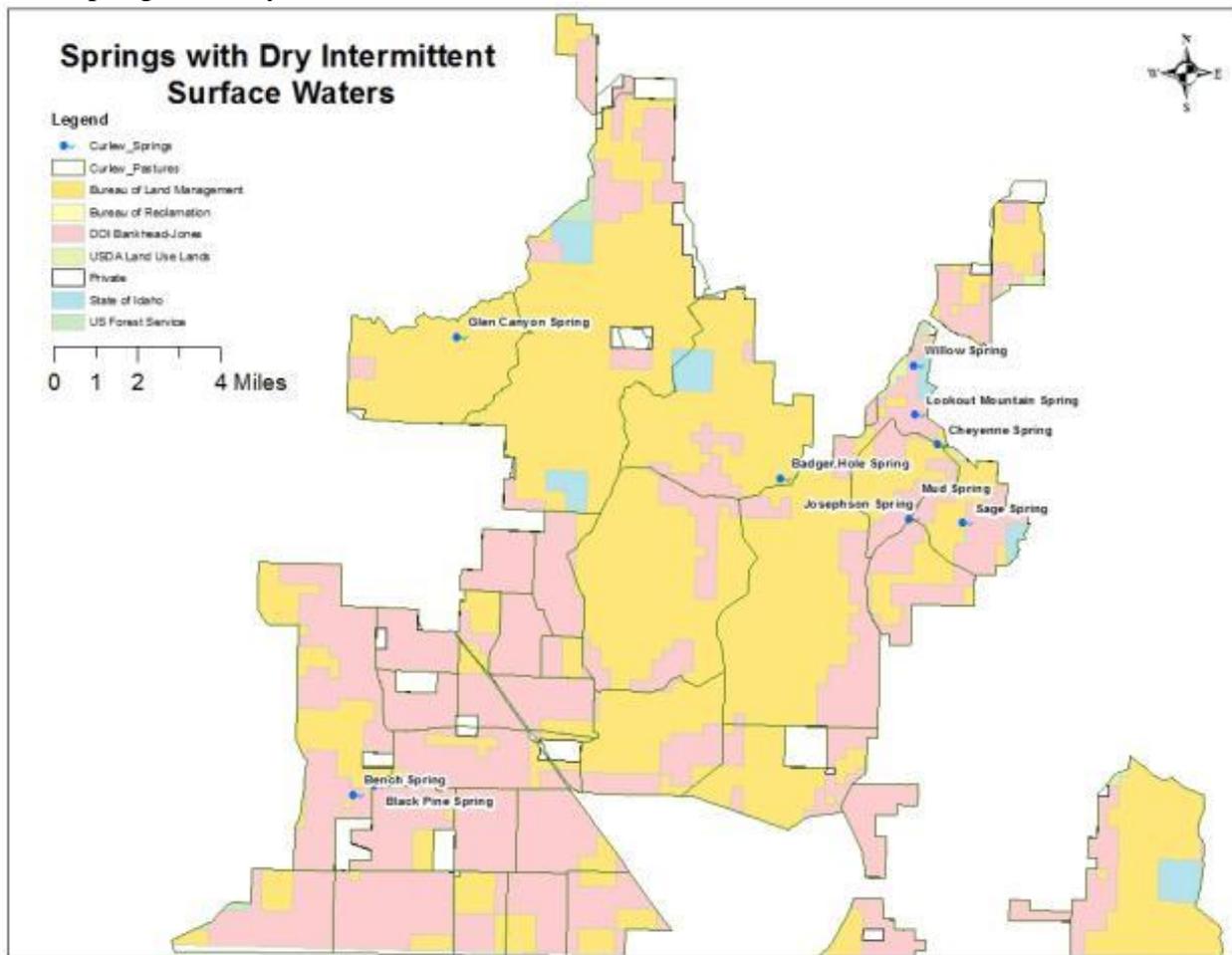
Rose spring in the South Black Pine pasture is a developed spring with a flow through system. The water is collected in a headbox, and piped to nearby troughs. The overflow is piped into a stock pond a short distance from the trough. Surface waters seep to the surface at this spring but do not form a stream channel. Rose spring has a buck and pole fence surrounding a riparian area of about 3 acre. Where water comes to the surface within the enclosure the vegetation is dominated by cattails and sedges while sagebrush and upland grass species surround this area. There is essentially no surface water or stream channel development outside of the enclosure. In 2011, it was rated FAR with no apparent trend; Appendix C.

ii. Springs with Dry Intermittent Surface Waters

The remaining ten surface waters within the evaluation area are dry for months and only run intermittently, along short runs with no outlet; and the surface waters eventually soak back into the soil. IDEQ (2011) refers to these streams as dry intermittent. Most of these springs are protected by fences and piped to troughs located some distance from the spring heads. Some springs feed troughs that have an overflow pipe that waters shallow depressions below the trough.

The development of these springs may have caused a decrease and/or lack of surface water at the spring source. Modifications of these development designs to include shut off valves at the spring source and/or floats on the troughs likely would increase water retention at the spring source allowing for the re-establishment of riparian vegetation.

Figure 3.11: Springs with dry intermittent surface water within the evaluation area.



Badger Hole spring is located in the Trail Canyon pasture; there were no PFC data collected or analyzed for this spring. This is a developed spring with floats. Water is collected in a headbox and piped to a trough downslope of the spring. The overflow is collected in a stock pond a short distance from the trough. There is an enclosure around the spring however a road runs through the enclosure and the gates are missing and or never closed nullifying the function of the enclosure. Based on Project inspections and field visits, this spring lacks surface water and riparian vegetation. The lack of riparian vegetation and surface water may be attributed to development of the spring leading to decreased retention of water at the spring source.

Bench and Black Pine springs are located in the Van Koman pasture. Surface waters are intermittent at these springs.

Bench spring is a developed spring with a flow through system. Water is collected in a headbox and piped to a trough downslope of the spring. The overflow is piped into a stock pond a short distance from the trough. A non-functional wildlife enclosure with a small catch pond exists on the south side of the road from the spring. No water from the spring or pipeline system reaches the wildlife enclosure. Bench spring has ample vegetation within an enclosure; surface water occurs in an overflow channel that also feeds a catchment pond.

Black Pine spring has an enclosure fence that has not been maintained. Black Pine Spring is a developed spring with a flow through system. Water is collected in a headbox and piped to a trough. A stock pond catches the overflow.

Cheyenne spring is located in Meadow Brook Divide pasture. There were no PFC data collected or analyzed for this spring. At an unknown date an attempt to clean out the spring head breached the underlying clay layer. It is not expected that this spring will recover.

Glen Canyon spring is located in the Glen Canyon pasture. There was no PFC data collected or analyzed for this spring. This is a developed spring. All the water from the spring is collected and piped into a series of troughs. There is no surface water or riparian area associated with this spring.

Lookout Mountain, and Willow springs are located in the Meadow Brook Divide pasture. Surface waters are intermittent at Lookout Mountain, Lost and Willow springs.

Lookout Mountain spring is a developed spring with a flow through system. A project inspection in 2012 noted that the wooden enclosure fence around the spring head was in disrepair. In addition the overflow enclosure was in poor condition and it was not apparent that water reached it. There were no PFC data collected or analyzed for the Lookout Mountain spring.

Willow spring is a developed spring with a flow through system. Water is collected in a headbox and piped to a trough downslope of the spring. The headbox has a large enclosure surrounding it. The enclosure fence has not been maintained. Gates are not closed and cattle graze inside the enclosure. Surface water extends beyond the enclosure boundary intermittently. Willow spring rated FAR with no apparent trend in 2011see: photos Appendix C.

Josephson, Sage and Mud springs are located in the North Bowen pasture. Surface waters are intermittent at these springs.

Josephson spring has a steel jack fence enclosing the spring area. A spring box captures all of the water output from the spring and directs it 500 ft. down the drainage to a group of troughs in a fenced corral area in the Holbrook Burn pasture. Surface water exists outside the enclosure due to an overflow pipe as a shallow, muddy channel with Nebraska sedge and upland grass below the troughs.

Sage spring is a developed spring with a headbox, pipeline and trough. The most current project inspection which occurred in 1989 stated that the headbox was completely dry. It also stated that water was seen 15 to 20 feet outside the enclosure fence. There were no PFC data collected or analyzed for Sage spring. The current condition of the spring is unknown.

Mud spring is a developed spring and is a flow through system. The water is collected in a headbox, piped to three consecutive troughs. None of the troughs have floats and the last two troughs on the pipeline overflow onto the ground immediately adjacent to the troughs. Mud spring is located in the Holbrook Burn pasture. There were no PFC data collected or analyzed for this spring.

G. Wildlife

The evaluation area provides habitat for numerous wildlife species, including big game species such as mule deer, elk, moose, and pronghorn antelope, as well as small mammals, migratory birds, and sensitive species. Shrubs and aspen are important components of habitat for mule deer and elk; pronghorn prefer open country like grasslands and sagebrush steppe.

While habitat preference and mobility vary widely among wildlife species, big game species are highly mobile, range widely, and can select for optimal or preferred habitat characteristics opportunistically when necessary

(Sih 1980, Pyke 1984). Where areas are lacking in forage and cover relative to their particular habitat preferences, deer and elk can move to higher elevation habitats in the evaluation area, while pronghorn can move out of the evaluation area, south to lower elevations in Utah. Wildlife do not typically impact areas overgrazed by livestock (Ragotzkie and Bailey 1991) or burned areas because wildlife are mobile and will seek out optimal diets when or where available. On the other hand, wildlife may be drawn to disturbance areas when the vegetation begins to regrow or re-sprout following disturbance.

Wildland fires have reduced shrub and juniper cover on large portions of the evaluation area. As these components of the vegetation recover, wildlife habitat will improve over time. Mule deer, elk, and pronghorn use shrubland habitat for feeding, resting, and escape cover. Deciduous shrubs that re-sprout after fires, such as snowberry, recover fairly quickly. Sagebrush recovery takes much longer, ranging from 70-200 years (Baker 2006), since it must have a seed source to repopulate after fires. Junipers in the evaluation area are used for escape and thermal cover. Juniper recovery would take over 250 years to establish mature stands after fires (Huffman et al. 2012).

There are several small riparian areas in the evaluation area. Most of the water from developed springs is used to water livestock and is piped away from potential riparian areas. Some small riparian areas are fenced to exclude livestock use. These riparian areas provide both herbaceous and woody habitats within the enclosures for wildlife.

Sagebrush is recovering in habitats that have burned within the evaluation area; however, it may take 70-200 years to form a mature sagebrush steppe community (Baker 2006). Recovery from fires that occurred between 2000 and 2012 have showed trends towards recovery, but shrub recovery is slow, especially for species like mountain big sagebrush and antelope bitterbrush (a partial sprouter) that do not sprout after fire, compared to recovery of the herbaceous vegetation that may respond vigorously in years of good precipitation.

H. Migratory Birds

During the breeding seasons of 2000 and 2001, forty-four species of migratory birds were recorded within the evaluation area in three principle habitat types: sagebrush, juniper, and aspen (Table 3.10). Migratory birds may utilize more than one habitat type found within the evaluation area, such that 13 species occur in sagebrush steppe habitat, 20 species in juniper habitats, and 26 species occur in aspen habitats (Sauder 2002). The Idaho Bird Conservation Plan (Ritter, 2000) lists sagebrush as priority bird habitat in Idaho but does not list aspen or juniper as priority habitats; though “high priority” bird species use these habitats for foraging and breeding.

Table3.10: Migratory bird species recorded in Aspen (a), Juniper (j) and Sagebrush (s) habitats within the evaluation area 2000 and 2001

| Bird Species | Aspen | Juniper | Sagebrush |
|--|-------|---------|-----------|
| American Robin (<i>Turdus migratorius</i>) | X | | |
| American Goldfinch (<i>Spinus tristis</i>) | X | | |
| Ash-throated Flycatcher (<i>Myiarchus cinerascens</i>) | | X | |
| Bewick’s Wren (<i>Thryomanes bewickii</i>) | | X | |
| Black-capped Chickadee (<i>Poecile atricapillus</i>) | X | | |
| Black-headed Grosbeak (<i>Pheucticus melanocephalus</i>) | X | | |
| Blue-gray Gnatcatcher (<i>Poliophtila caerulea</i>) | | X | X |
| Brown-headed Cowbird (<i>Molothrus ater</i>) | X | X | X |
| Brewer’s Sparrow (<i>Spizella breweri</i>) | | X | X |
| Bushtit (<i>Psaltriparus minimus</i>) | | X | |
| Cassin’s Finch (<i>Aimophila cassinii</i>) | X | | |
| Chipping Sparrow (<i>Spizella passerina</i>) | | X | |
| Dark-eyed Junco (<i>Junco hyemalis</i>) | X | | |
| Dusky Flycatcher (<i>Empidonax oberholseri</i>) | X | | X |

| Bird Species | Aspen | Juniper | Sagebrush |
|---|-------|---------|-----------|
| Gray Flycatcher (<i>Empidonax wrightii</i>) | | X | X |
| Green-tailed Towhee (<i>Pipilo chlorurus</i>) | X | | X |
| Hairy Woodpecker (<i>Picoides villosus</i>) | X | | |
| Horned Lark (<i>Eremophila alpestris</i>) | | | X |
| House Finch (<i>Carpodacus mexicanus</i>) | | X | |
| House Sparrow (<i>Passer domesticus</i>) | | X | |
| House Wren (<i>Troglodytes aedon</i>) | X | | |
| Juniper Titmouse (<i>Baeolophus ridgwayi</i>) | | X | |
| Lark Sparrow (<i>Chondestes grammacus</i>) | | X | |
| Lazuli Bunting (<i>Passerina amoena</i>) | X | | |
| Loggerhead Shrike (<i>Lanius ludovicianus</i>) | | X | X |
| MacGillivray's Warbler (<i>Oporonis tolmiei</i>) | X | | |
| Mountain Bluebird (<i>Sialia currucoides</i>) | X | X | |
| Northern Flicker (<i>Colaptes auratus</i>) | X | X | |
| Orange-crowned Warbler (<i>Vermivora celata</i>) | X | | |
| Pine Siskin (<i>Spinus pinus</i>) | X | | |
| Plumbeous Vireo (<i>Vireo plumbeus</i>) | X | X | |
| Red-breasted Nuthatch (<i>Sitta canadensis</i>) | | X | |
| Red-naped Sapsucker (<i>Sphyrapicus nuchalis</i>) | | X | |
| Rock Wren (<i>Salpinctes obsoletus</i>) | | | X |
| Sage Sparrow (<i>Amphispiza belli</i>) | | X | |
| Sage Thrasher (<i>Oreoscoptes montanus</i>) | | X | X |
| Spotted Towhee (<i>Pipilo maculatus</i>) | X | X | X |
| Vesper Sparrow (<i>Pooecetes gramineus</i>) | | X | X |
| Warbling Vireo (<i>Vireo gilvus</i>) | X | | |
| Western Meadow Lark (<i>Sturnella neglecta</i>) | | X | X |
| Western Tanager (<i>Piranga ludoviciana</i>) | X | | |
| Western Wood-Pewee (<i>Contopus sordidulus</i>) | X | | |
| Yellow Warbler (<i>Dendroica petechia</i>) | X | | |
| Yellow-rumped Warbler (<i>Dendroica coronata</i>) | X | | |

Habitats with a sagebrush component provide the most extensive migratory bird habitat within the evaluation area; i.e. approximately 123,250 acres that includes both native plant communities and rangeland seedings in which sagebrush has re-established. Sagebrush is used as nesting cover, feeding habitat, and escape cover for migratory birds (Ritter, 2000). Wildfires have decreased the amount of sagebrush and degraded the shrubland structure that is important to migratory birds. At higher elevations, sagebrush steppe grades into mountain shrub habitats where mountain big sagebrush and a number of deciduous shrubs dominate. Migratory bird species use these mountain shrub habitats for nesting, foraging and escape cover as well.

Juniper woodlands within the evaluation area consist of Utah juniper. The density of juniper in these woodlands varies with some of the woodlands densely stocked, and others a more open savannah. The migratory birds associated with juniper generally use the older stands and older trees within the younger stands (Ritter 2000).

Aspen and mountain shrub provide deciduous components within the sagebrush steppe habitats, increasing migratory species diversity. The complex and often moist aspen understories attract insects that are important to the insectivores (Ritter, 2000). Small pockets of aspen may be important locally in the mountainous areas, but make less than 1% of the evaluation area's area.

Migratory birds use shrubland and juniper habitat for nesting, feeding and escape cover. Wildland fires have reduced shrub and juniper cover on large portions of the evaluation area. As these components of the vegetation recover, migratory bird habitat will improve. Deciduous shrubs that re-sprout after fires, such as snowberry, recover fairly quickly. Sagebrush recovery would take much longer (70 - 200 years) as it must have

a seed source to repopulate after fires (Baker 2006). Junipers would take 250+ years to establish mature stands after fires (Huffman et al. 2012).

I. Special Status Animals

Type 1 special status species include: federally listed threatened or endangered species and experimental essential populations. There are no Type 1 special status species within the evaluation area. Type 2 special status species include: Idaho BLM sensitive species, including USFWS proposed and candidate species, Endangered Species Act (ESA) species delisted during the past 5 years, and ESA experimental non-essential populations (BLM 2014).

Type 2 sensitive species (Table 3.11) occurring within the evaluation area include: the Greater Sage-grouse (*Centrocercus urophasianus*), the Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*), the ferruginous hawk (*Buteo regalis*), the Brewer’s sparrow (*Spizella breweri*), the loggerhead shrike (*Lanius ludovicianus*), the sage sparrow (*Amphispiza belli*), the burrowing owl (*Athene cunicularia*), the long-billed curlew (*Numenius americanus*), the short-eared owl (*Asio flammeus*), the golden eagle (*Aquila chysaetoe*), the green-tailed towhee (*Pipilo chlorurus*), the Silver-haired bat (*Lasionycteris noctivagans*), the Big Brown bat (*Eptesicus fuscus*), the Little Brown bat (*Myotis lucifugus*), the Western Small-footed Myotis (*Myotis ciliolabrum*), and the Long-eared Myotis (*Myotis evotis*) (BLM 2014).

Table 3.11 – Type 2 Sensitive Species Habitat Associations

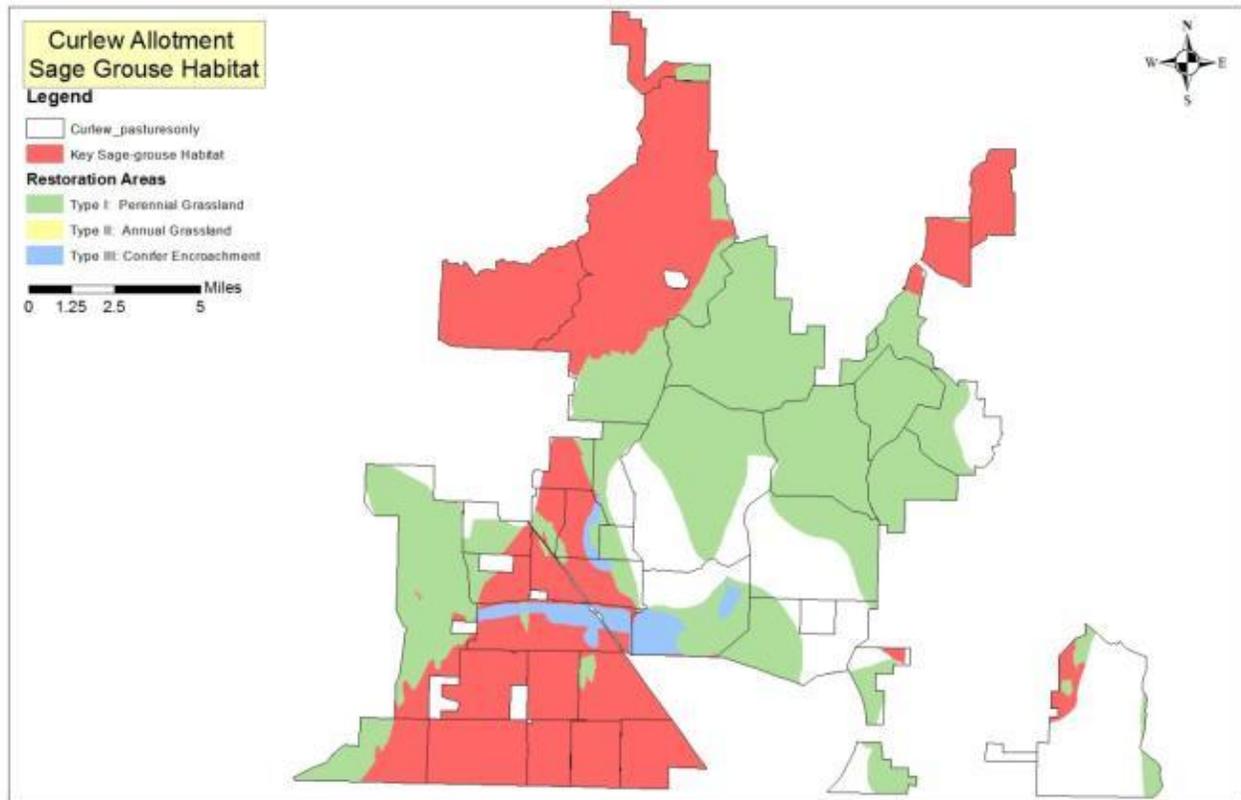
| Sensitive Species Ranking | Sagebrush /grassland | Riparian | Juniper | Aspen | Mountain Shrub | Low conifer |
|------------------------------|----------------------|----------|---------|-------|----------------|-------------|
| Type 2 | | | | | | |
| Greater Sage Grouse | X | | | | X | |
| Columbia Sharp-tailed Grouse | X | | | | X | |
| Ferruginous Hawk | X | | X | | | |
| Loggerhead Shrike | X | | X | | X | |
| Sage Sparrow | X | | | | | |
| Brewer’s Sparrow | X | | | | | |
| Burrowing Owl | X | | | | | |
| Long-billed Curlew | X | | | | | |
| Short-eared Owl | X | X | | | | |
| Golden Eagle | X | X | X | X | X | X |
| Green-tailed Towhee | X | | | | X | |
| Silver-haired Bat | X | X | X | | X | |
| Big Brown Bat | X | X | X | | X | |
| Little Brown Bat | X | X | X | | X | |
| Western Small-footed Myotis | X | X | X | | X | |
| Long-eared Myotis | X | X | X | | X | |

In 2006, over concerns with a downturn in sage grouse numbers and loss of quality habitat, the Idaho Department of Fish & Game (IDFG) and the BLM mapped and classified sage grouse habitats within the evaluation area as Key, Restoration-1, and Restoration-3 (Table 3.12, Figure 3.10,). Key habitat are areas of intact sagebrush that provide resources for sage-grouse during some portion of the year for nesting, late brood-rearing and seasonal transition sites from winter to spring, spring to summer, summer/fall to winter; Restoration-1 habitat lacks the shrub component of Key habitat; Restoration-3 habitat is juniper dominated communities considered to have encroached upon Key habitat.

Table 3.12: Greater sage grouse key, restoration and other habitat acres and percent of the evaluation area

| Coordinated Sage Grouse Efforts | Habitat Classification | Acres | %- Evaluation Area |
|---|------------------------|---------|--------------------|
| <i>Sage-Grouse Advisory Committee (IDFG Conservation Plan for the Greater Sage Grouse in Idaho, 2006)</i> | Key | 53,896 | 40 |
| | Restoration-1 | 58,522 | 44 |
| | Restoration-3 | 3299 | 2 |
| | Other | 18,250 | 14 |
| | Total = | 133,967 | <100> |

Figure 3.12: Distribution of Key, Restoration Type I, II, and III Greater sage grouse habitat within the evaluation area.

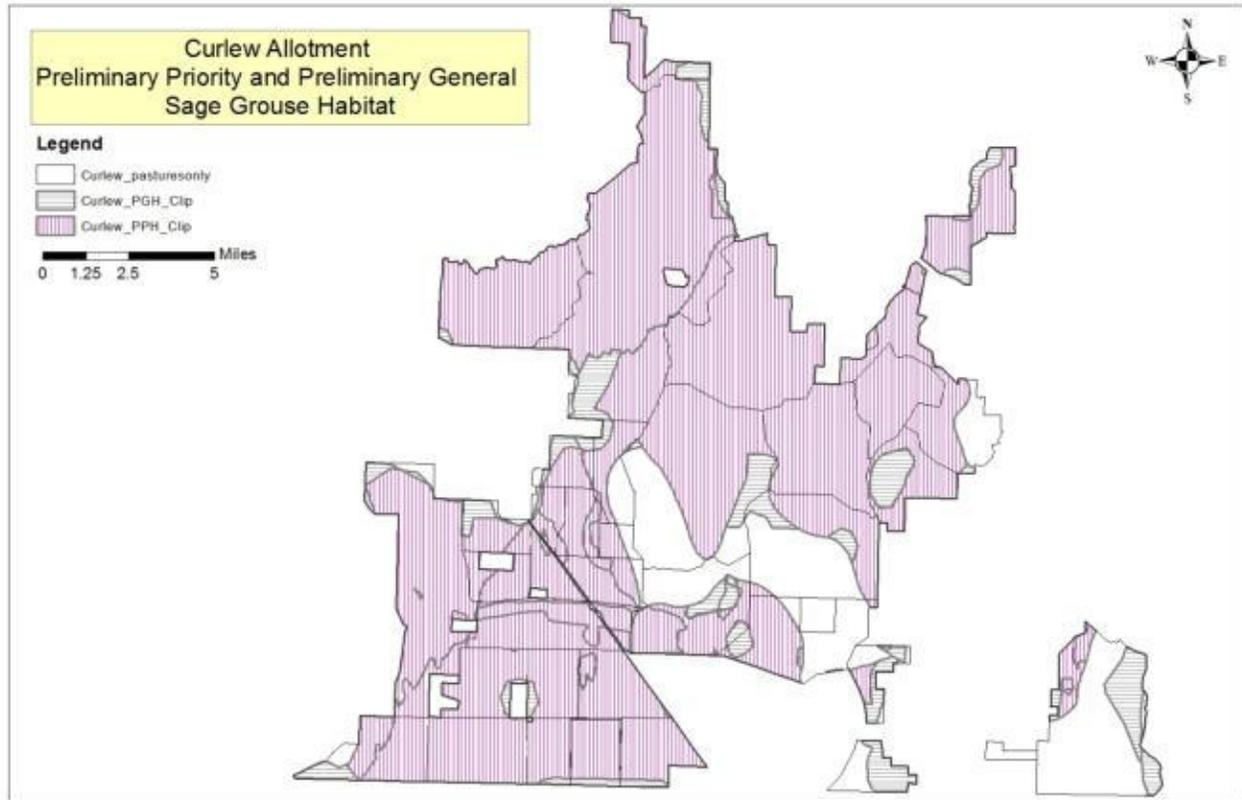


More recently, the National Sage Grouse Initiative (Figure 3.11) mapped and classified Preliminary Priority Habitat (PPH) and Preliminary General Habitat (PGH) (Table 3.13) in the evaluation area as part of the 500,000+ acre, Curlew Valley Conservation Area; composed of BLM, USFS and private lands. PPH has the highest conservation value relative to maintaining sustainable sage-grouse populations range-wide; PGH represents occupied sage-grouse habitats other than PPH, like connectivity corridors, habitat with low lek density or areas range-wide that lack data on sage-grouse.

Table 3.13: Greater sage grouse conservation habitats within the evaluation area

| Coordinated Sage Grouse Efforts | Habitat Classification | Acres | %- Evaluation Area |
|--|------------------------|----------------|--------------------|
| <i>Sage-Grouse Conservation Habitats (Sage-grouse National Technical Team, 2012)</i> | Preliminary Priority | 106,847 | 80 |
| | Preliminary General | 11,772 | 9 |
| | Other | 15,348 | 11 |
| | Total = | 133,967 | 100 |

Figure 3.13: Distribution of preliminary priority and general Greater sage grouse habitat within the evaluation area.



The majority of Greater sage grouse leks in the evaluation area region are found on the USFS Curlew National Grasslands (Figure 3.12), which occupy the valley bottoms that become snow free early in the spring. At least 16 Greater sage-grouse leks are located on USFS lands adjacent to the northeast portion of the evaluation area, and at least one lek known to be active within the evaluation area in the southwest corner. BLM administered public lands within the evaluation area provide Greater sage grouse habitat for nesting, brood rearing and winter foraging habitat. Sage-grouse habitat in the evaluation area is adjacent and continuous with habitat in Utah, and across southern Idaho (Figure 3.13). In Utah, the Box Elder Greater sage-grouse management area is located west of I-84 and directly south of the state line. Greater sage-grouse habitat within the evaluation area is not connected to habitat in southeast Idaho (Bear Lake area) or northeast Utah.

Figure 3.14: Occupied Greater sage grouse leks within the evaluation area and Curlew National Grasslands.

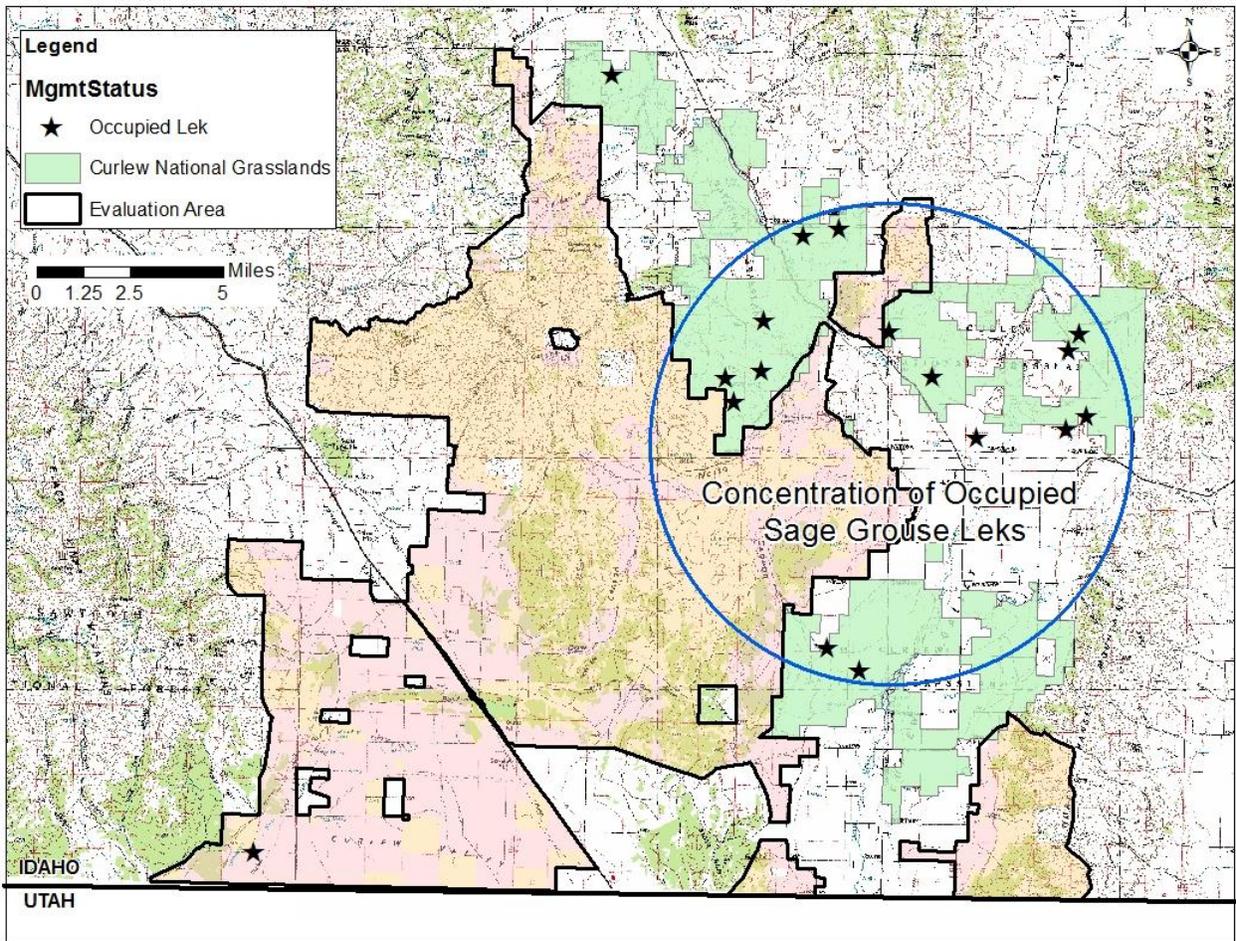
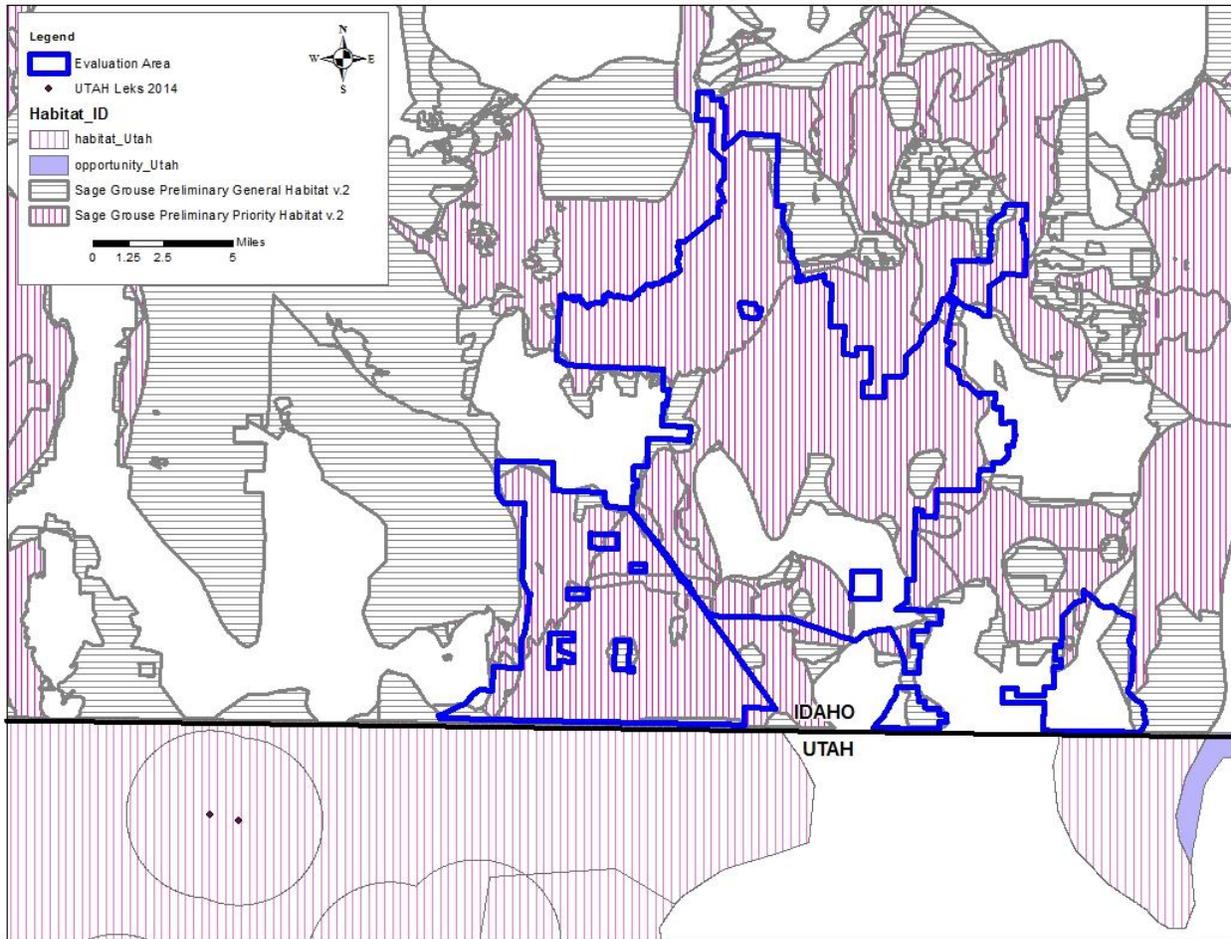
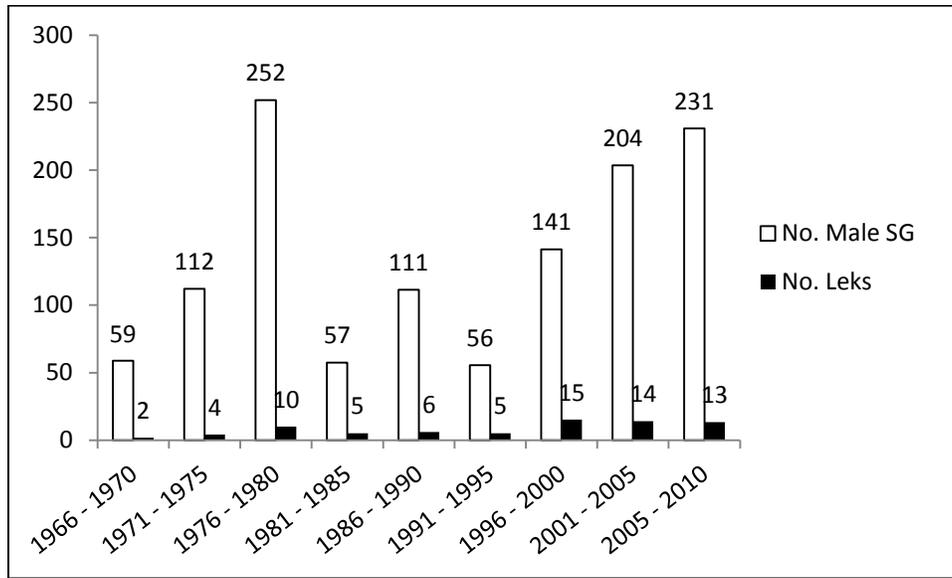


Figure 3.15: Greater sage grouse preliminary priority and general habitat within the evaluation area and surrounding area.



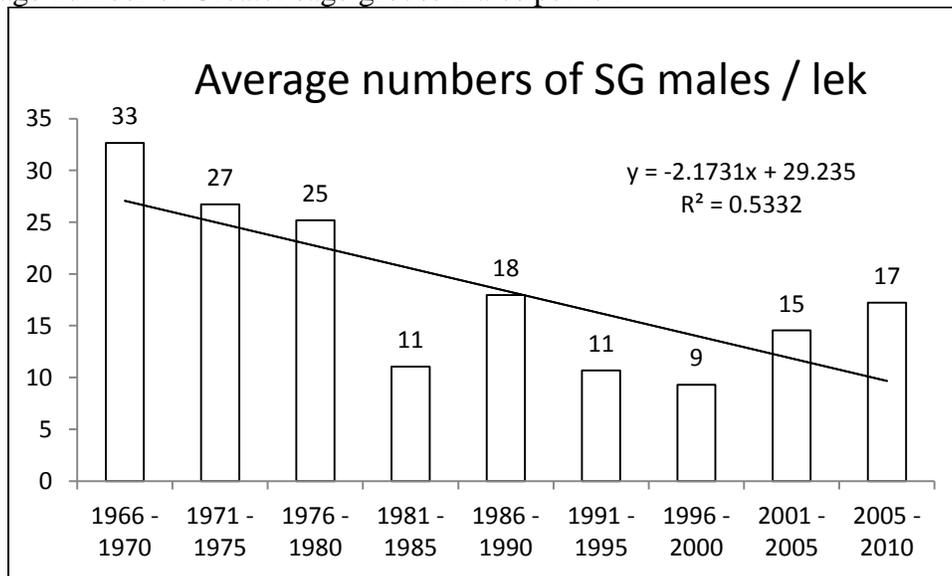
The Idaho Department of Fish and Game conducts annual counts of male Greater sage-grouse on leks within the evaluation area. Figure 3.14 shows the total number of male Greater sage grouse counted on leks within the evaluation area region over five-year periods between 1966 and 2010; counts ranged between 278 and 1,259 sage grouse. The graph also depicts the number of leks surveyed within the area en-circled in figure 3.12.

Figure 3.16: Average number of Greater sage grouse males counted and number of leks for every / 5-year period, 1996 to 2010.



There appears to be an upward, positive trend in Greater sage-grouse numbers in the Curlew region between 1966 and 2010. This may be a result of additional effort to locate leks beginning in the 1996-2000 period. During this period Greater sage-grouse were counted on an average of 14 leks. During the other intervals, the number of leks surveyed only exceeded six once. Ten leks were surveyed during the 1976 -1980 period. The average number of males per lek during this same period, however, shows a generally negative trend (Figure 3.15). The only known active lek within the evaluation area (West Black Pine) had 6 males in 2014. The highest number of males counted was 12 within the last decade.

Figure 3.17: Average number of Greater sage grouse males per lek

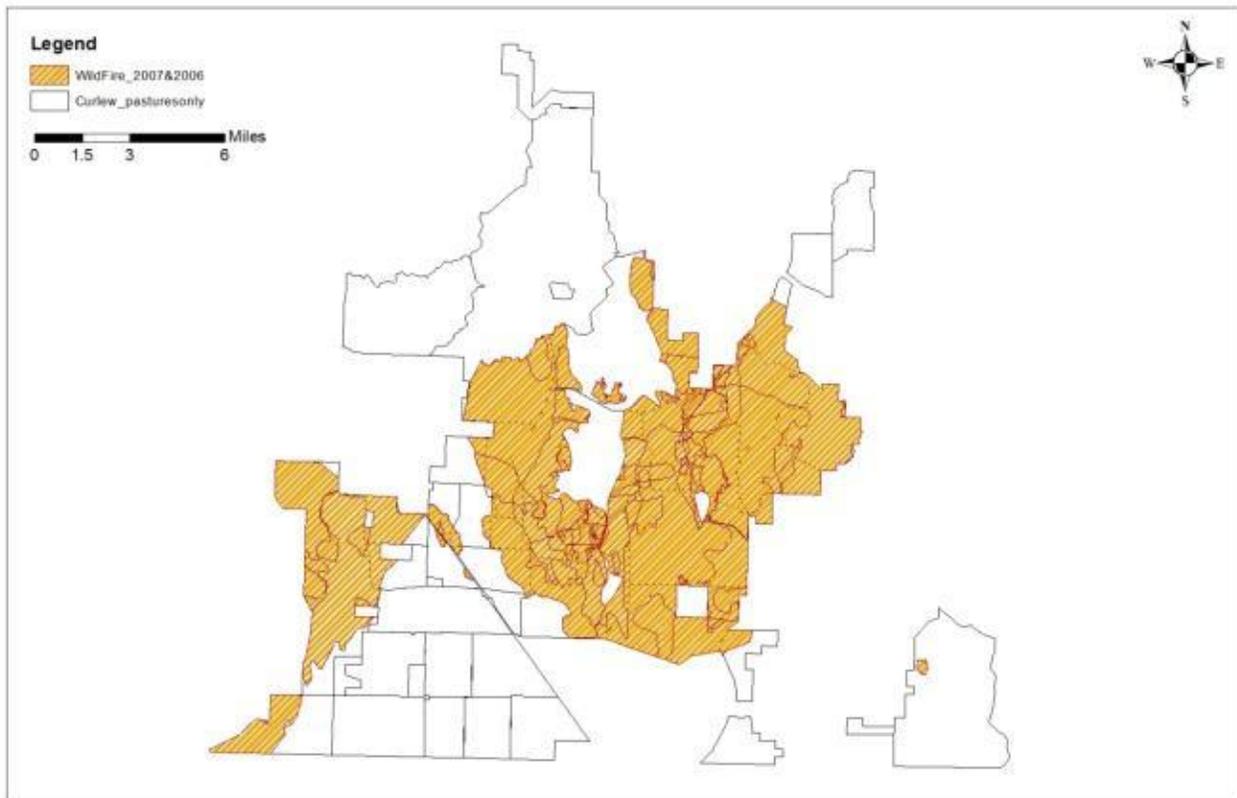


Between 2000 and 2011, wildfires eliminated or reduced sagebrush cover on 48% (67,322 acres) of the evaluation area. During the summers of 2006 and 2007, wildland fires (Figure 3.16) burned at least 61,074 acres of sagebrush and juniper habitat that previously was identified as Key Habitat, which Greater sage-grouse use as nesting and brood-rearing cover, escape cover and winter habitat. This habitat was down-graded to Restoration-1 Habitat, which lacks a quality sagebrush canopy but has a sufficient understory of grass and forbs.

Wildfires burn woody shrubs, however, sagebrush repopulates only from seed while shrubs such as snowberry, serviceberry and chokecherry sprout after fires. Recovery of healthy sagebrush steppe in the Curlew region is expected to take from 70 to 200+ years, depending upon site characteristics and climatic trends.

Since the wildfires of 2006/2007, approximately 20,279 acres have been aerially seeded with either mountain big sagebrush or basin big sagebrush, and approximately 1,038 acres have been broadcast seeded. Between 2008 and 2014 approximately 110,000 sagebrush seedlings have been planted within the evaluation area within either Preliminary General Habitat or Preliminary Priority Habitat.

Figure 3.18: Wild fires that occurred between 2006-2007 within the evaluation area.



There are several riparian areas that are not in properly functioning condition. Properly functioning riparian provides high quality brood rearing sites for sage-grouse. Degraded sites do not provide succulent vegetation nor the diversity and quantity of insects used by grouse broods.

Based upon the need for better guidelines and new information concerning sage grouse habitat requirements [A Framework to Assist in Making Sensitive Species Habitat Assessments for BLM-Administered Public Lands in Idaho Sage Grouse \(*Centrocercus urophasianus*\)](#) was developed in May of 2000 and updated, 2010 and 2013. Habitat requirements are based on a publication by Connelly et al. (2000) which identified attributes of productive Greater sage-grouse habitat: sagebrush canopy with 12 – 32 inch height and between 15-25 % cover and herbaceous cover, at least 15-25%, composed of both grasses and forbs, with a height of at least 7” during nesting.

In 2000, Greater sage-grouse habitat was assessed at 35 sites to evaluate the quality of nesting and early brood-rearing habitats within the evaluation area (Appendix E, Sage Grouse Habitat Studies). In 2011, the survey was

repeated at 28 of the original sites and is included in this evaluation. In 2012, 21 of the original 35 sites were resampled along with one additional site.

In 2013, 55 sites (Figure 3.17) were assessed in conjunction with the Land Health Assessments. These were new, independent sites compared to the surveys conducted in 2000, 2011, 2012. Data was collected every half meter for fifty meter transects. The information was used to fill out worksheets to determine if the habitat was suitable, marginal or unsuitable (Appendix E: Sage Grouse Habitat Studies). For example, breeding habitat requires 15-25% sagebrush canopy cover to be suitable for breeding habitat. Less than 5% sagebrush canopy cover is unsuitable and 5-15% and greater than 25% sagebrush canopy cover provides marginal breeding habitat.

When the data from 2000, 2011, 2012 and 2013 are compared, nine sites changed from either suitable or marginal habitat to unsuitable habitat. For seven of these sites the downgrade can be traced back to the 2006/2007 fires which removed sagebrush canopy cover.

In August of 2012, habitat mapping was conducted to determine the extent of breeding (Figure 3.18), summer (Figure 3.19), and winter (Figure 3.20) habitat in the evaluation area. The steps taken to perform this analysis can be found in Appendix E, 2013 Sage Grouse Habitat Assessment. The result of this exercise yielded occupied and potential breeding, summer and winter sage grouse habitat. These results were used to assign each of the 2013 HAF assessments to one or more habitat categories.

Figure 3.19: Map of Sage Grouse Habitat Assessment locations for 2013.

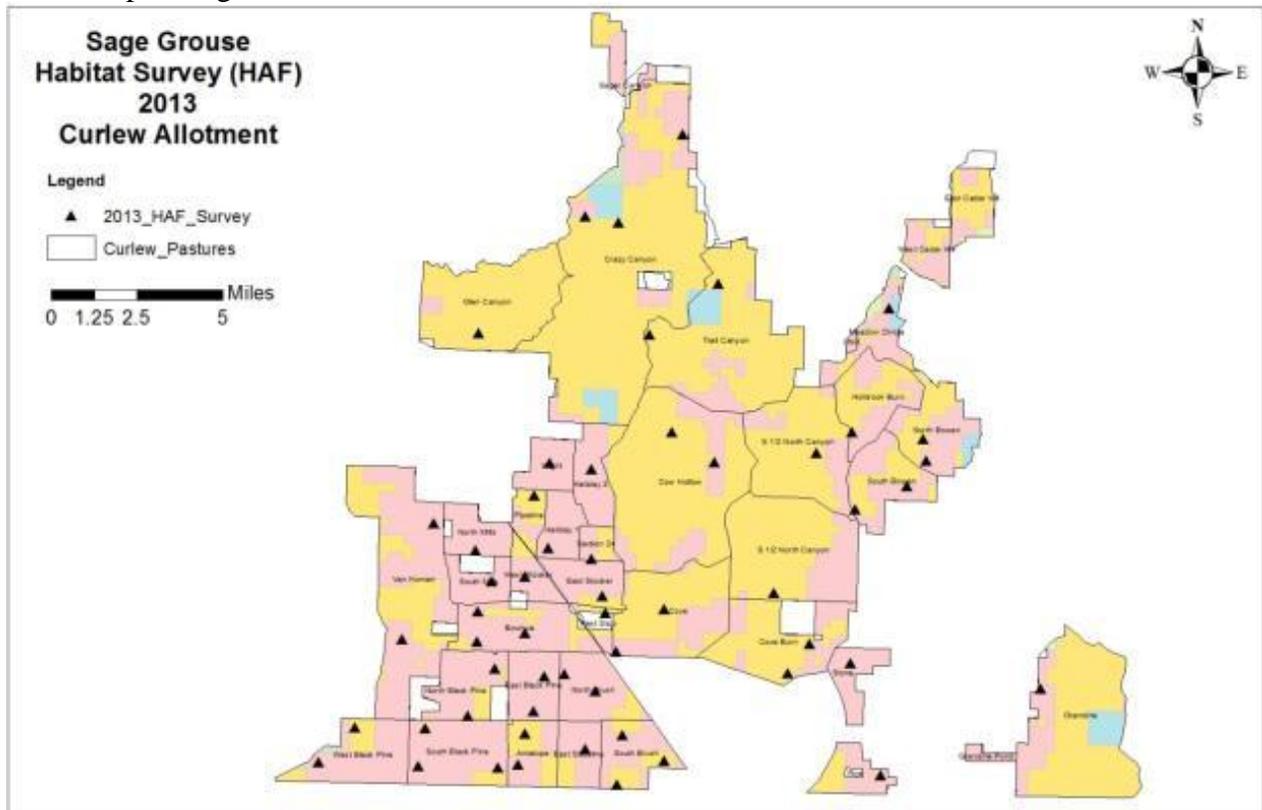


Figure 3.20: Map of both occupied and potential Breeding Habitat and HAF Site IDs.

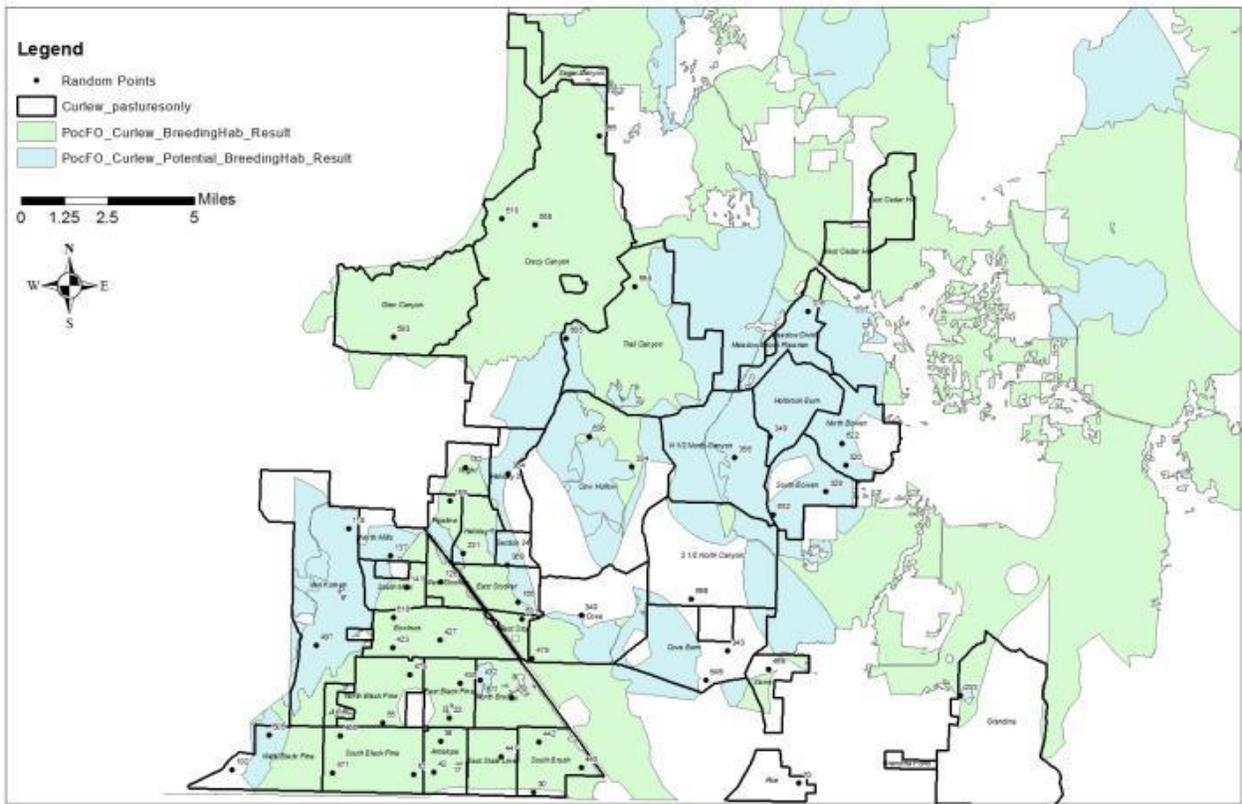


Figure 3.21: Map of both occupied and potential Summer Habitat and HAF Site IDs.

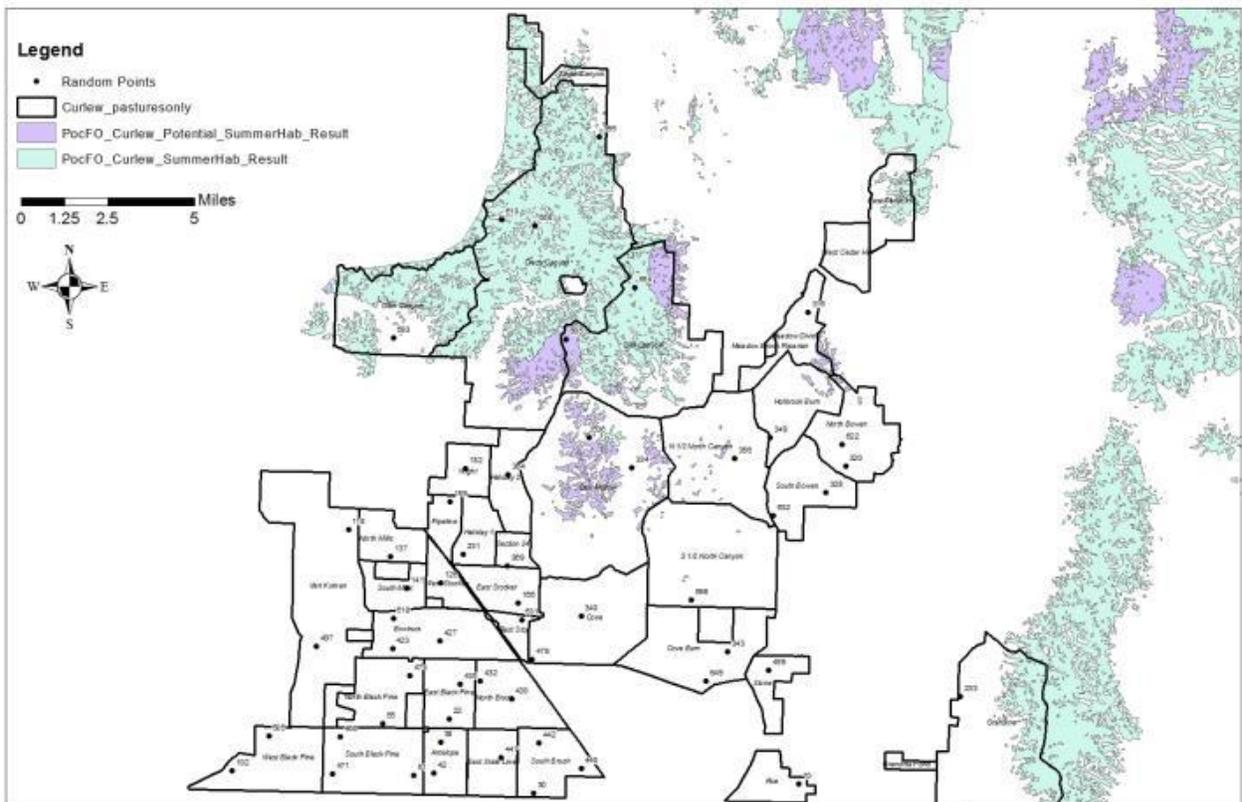
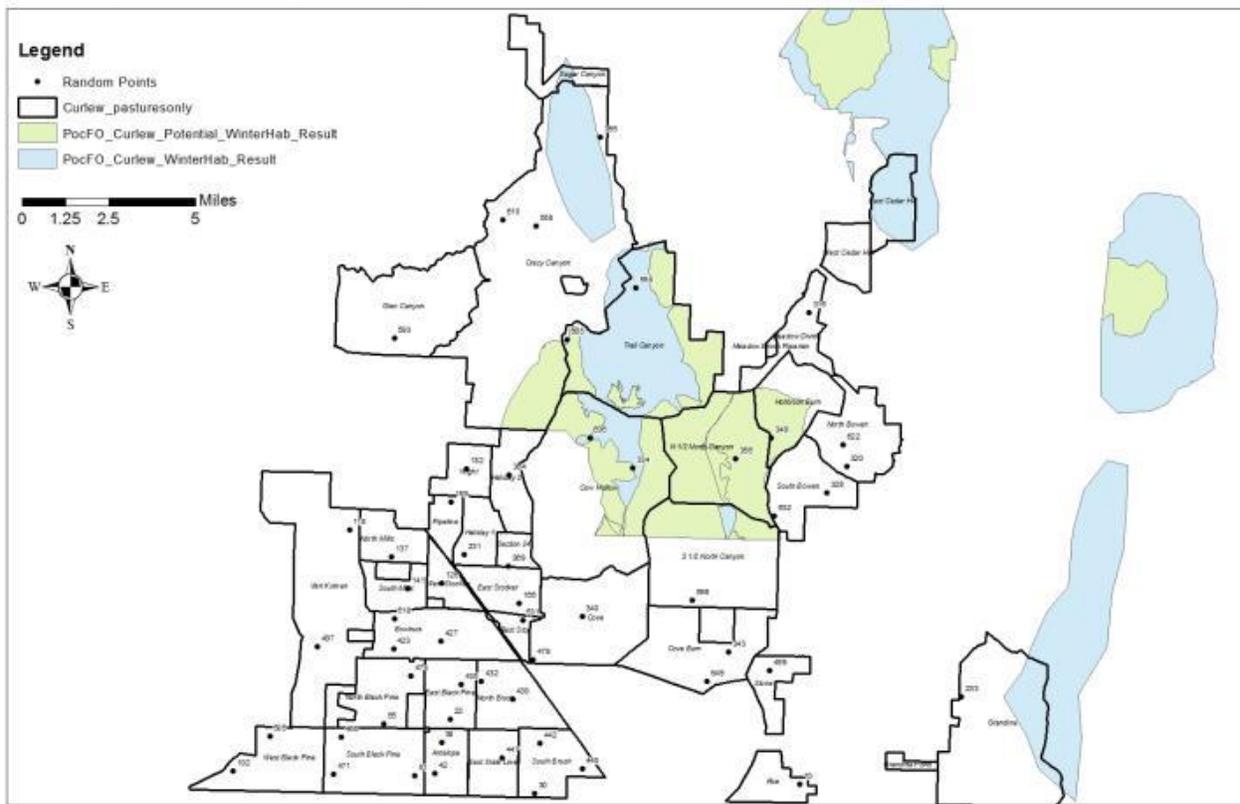


Figure 3.22: Map of both occupied and potential Winter Habitat and HAF Site IDs.



Of the 55 HAF surveys conducted in 2013, 50 were located within occupied or potential breeding habitat. Only 3 of those sites were suitable sage grouse breeding habitat, 17 were marginal while the remaining 30 were unsuitable. The major factor effecting potential and occupied breeding habitat was the average sagebrush canopy cover followed by the average herbaceous grass and forb height (See Appendix E; 2013 Sage Grouse Habitat Assessment for detailed study plot information).

Six of the 55 HAF surveys conducted in 2013 were located within occupied or potential summer habitat. Of those only 1 was suitable, 2 were marginal and the remaining 3 were unsuitable. The major factor influencing the determinations was again the reduced average sagebrush canopy cover.

Seven of the 55 HAF surveys conducted in 2013 were located within occupied or potential winter habitat. None of the sites were suitable winter habitat, 2 were marginal and the other 5 were unsuitable winter habitat. This again was due to reduced average sagebrush canopy cover.

Additional Sensitive Species in the Evaluation Area

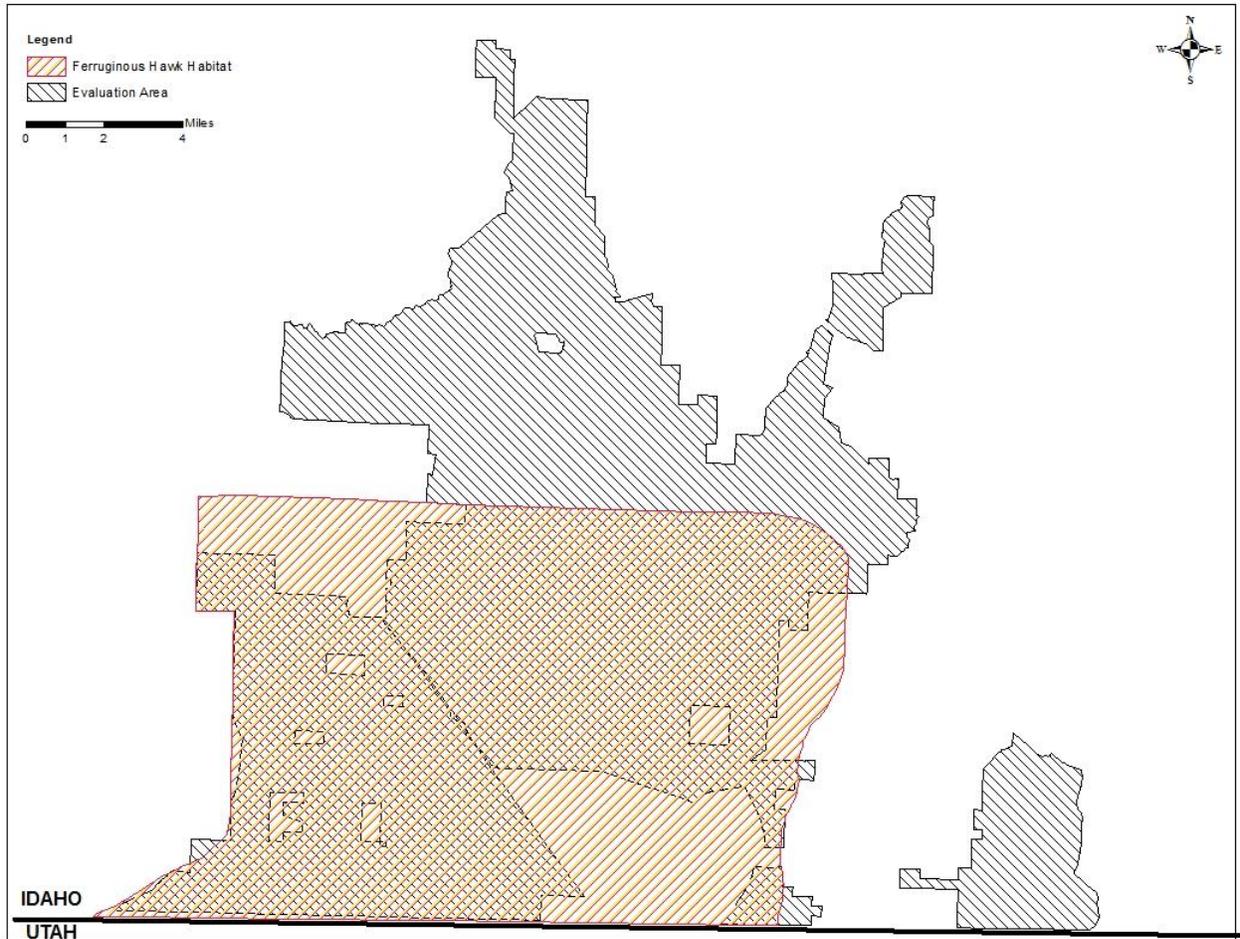
A major focus of the evaluation was sage-grouse habitat, but several other sensitive species occur within the evaluation area. The following sections discuss these species and their habitats. Sage grouse habitat is the limiting factor therefore it was used as the basis for the other species.

Ferruginous Hawks

The Ferruginous hawk habitat in the evaluation area has been designated a “globally important area” for nesting Ferruginous hawks by the American Bird Conservancy (Chipley 1998). The hawks nest in juniper trees, generally single trees or a small group of trees, surrounded by sagebrush habitat. The extensive fires in 2006 –

2007 reduced shrub cover and degraded the habitat of jackrabbits and other small mammals, major prey items of Ferruginous hawks within nearly half of their habitat within the evaluation area. Ten nesting platforms were installed 25 plus years ago. Use has varied through the years with the most documented use being six platforms in one year.

Figure 3.23: Ferruginous Hawk Habitat



Columbian sharp-tailed grouse

In the evaluation area Columbian sharp-tailed grouse and greater sage-grouse are sympatric. The two species use the habitat differently. Sharp-tails nest closer to leks than sage-grouse. Most female sharp-tails nest within 1 mile of a lek (Meints 1991). Sharp-tails use sagebrush stands but do not require sagebrush for nesting and brood rearing habitat. In southeast Idaho sharp-tails make extensive use of Conservation Reserve Program (CRP) fields even if there are no shrubs present (Sirotnak et al 1991). CRP fields provide undisturbed herbaceous nesting cover and brood rearing habitat. During the winter, sharp-tails use deciduous shrubs such as serviceberry and chokecherry (Marks and Marks 1987). Unlike sagebrush these shrubs sprout after fires but have to be above snow level (5-6 feet tall) before they provide winter habitat. The fires of 2006 – 2007 reduced the amount of winter habitat for sharp-tails in the evaluation area.

Other Sensitive Birds

The remainder of the sensitive bird species in the evaluation area use sagebrush/grassland habitat during some portion of their life. The sage-sparrow, the loggerhead shrike, the Brewer's sparrow, and the green-tailed

towhee all place their nests in live shrubs (Wiens and Rotenberry 1981, Petersen and Best 1985, Norris 1968). These species also make use of sagebrush plants by gleaning insects from them, or in the case of the shrike using them as perches to forage from. The burrowing owl, the short-eared owl and the golden eagle do not use sagebrush plants for nesting, but they reside in sagebrush habitat and prey on small mammals that inhabit sagebrush. Only the long-billed curlew avoids shrubs and uses grasslands. The 2006 – 2007 fires decreased shrub habitat for species that require it in the evaluation area.

IV. LAND HEALTH EVALUATION

In the summer of 2013 an interdisciplinary team visited 55 sites and assessed the evaluation area following the protocol outlined in Technical Reference 1734-6, Interpreting Indicators of Rangeland Health Version 4. Following the collection of field data, the team reviewed the data and assigned ratings of extreme to total, moderate to extreme, moderate, slight to moderate, or none to slight departure from reference condition to each site for the three attributes; Soil and Site Stability, Hydrologic Function, and Biotic Integrity (Appendix A).

Figure 4.1: Locations of sites used for the 2013 Land Health Assessment.

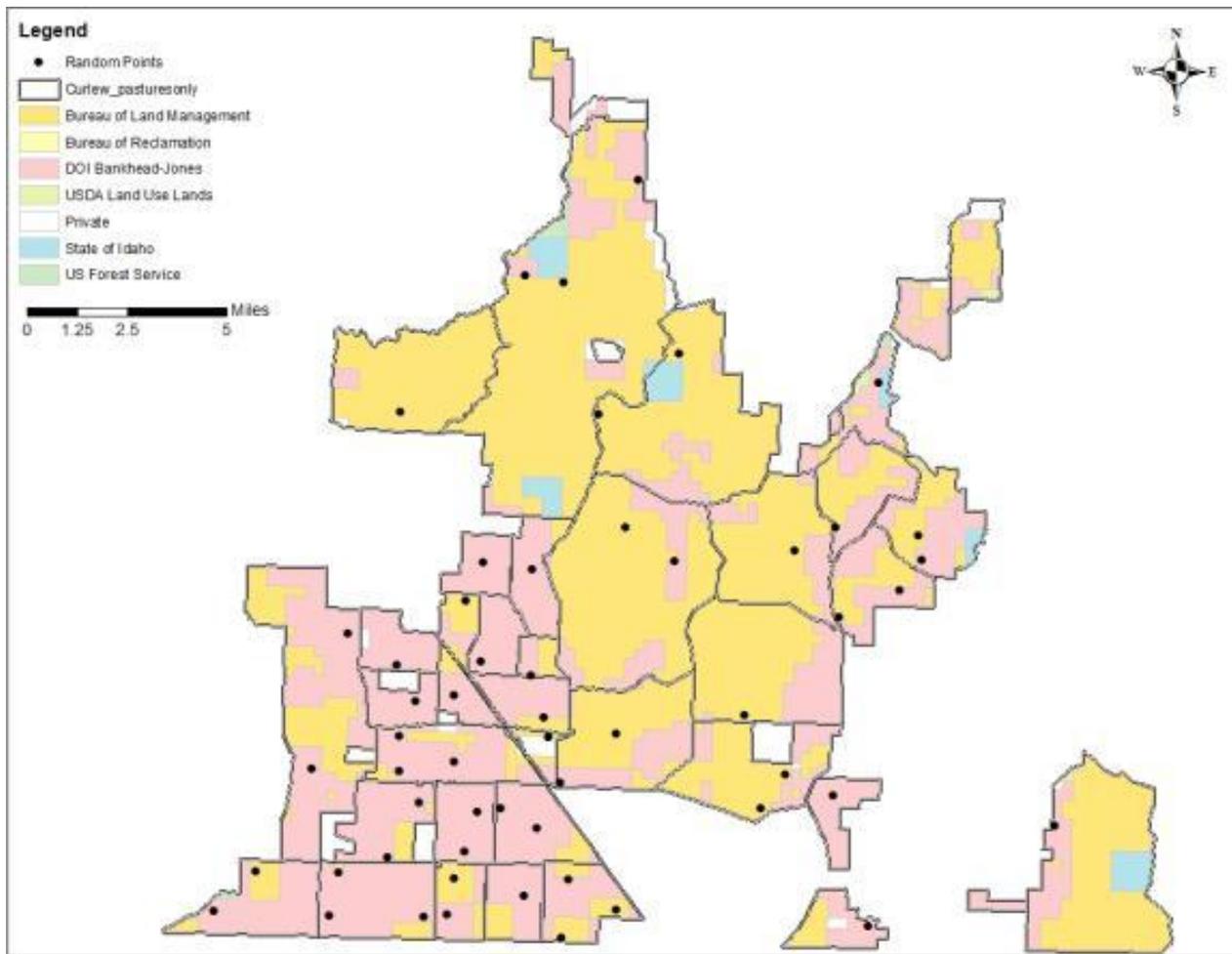
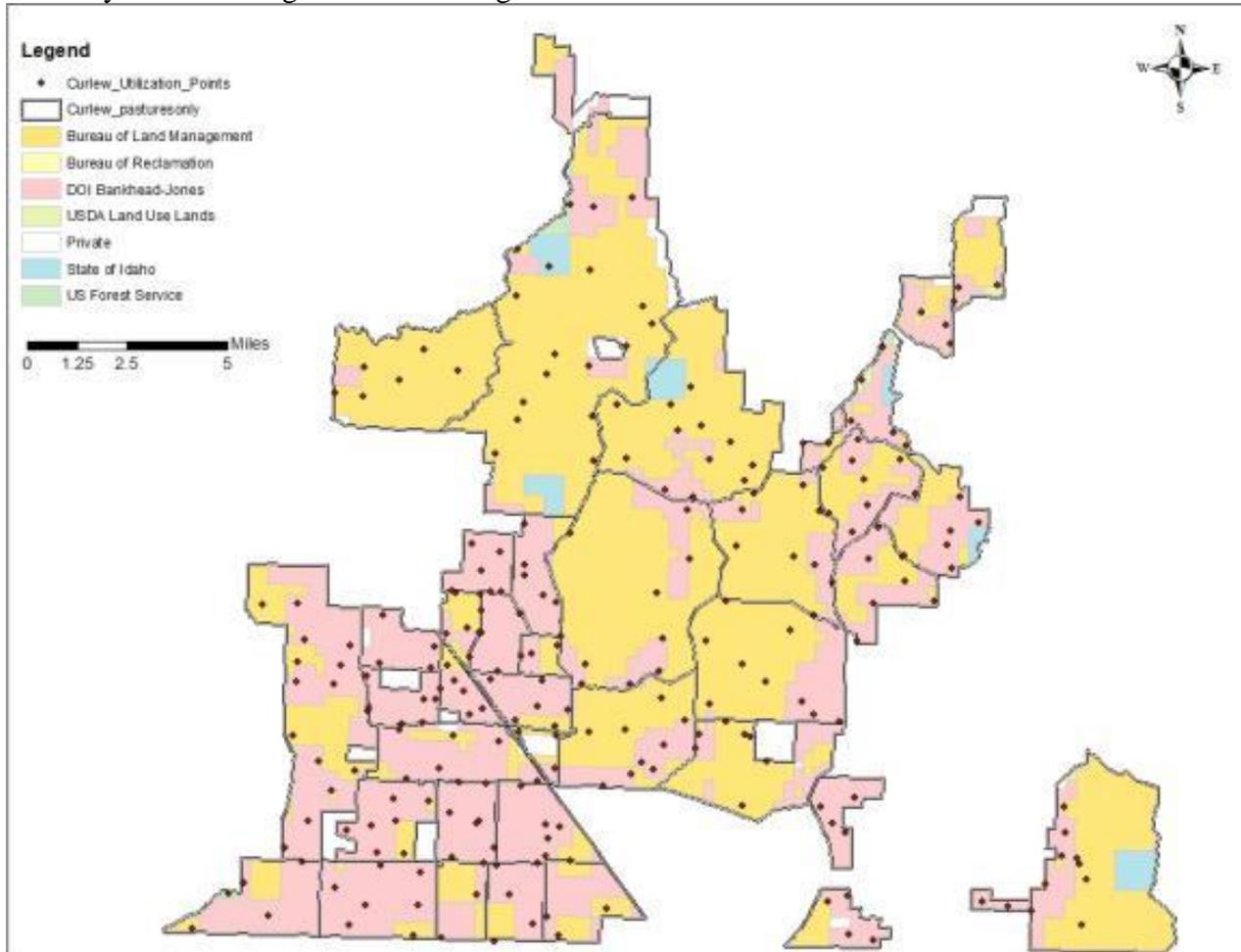


Figure 4.2: Key areas for rangeland monitoring for the evaluation area.



Methodology

i. Methodology used to evaluate Standard 1- Watersheds.

Watersheds were evaluated using the results of the Soil and Site Stability and Hydrologic Function attributes from the Land Health Assessment, as well as utilization levels, utilization photos, field observations and professional judgment. This information was used to determine if the standard was being met or not meeting. Typically, ratings of none to slight or slight to moderate for both attributes were considered to be meeting Standard 1. Ratings of moderate to extreme or extreme to total for either attribute were considered to be not meeting Standard 1. Ratings of moderate for either attribute were further reviewed. The status of the standard was then assigned for the site based on the review of additional information. In all cases the preponderance of evidence was used to make the final determination.

ii. Methodology used to evaluate Standard 2 – Riparian Areas and Wetlands.

Riparian proper functioning condition (PFC) was utilized as a qualitative method for assessing the condition of riparian and wetland areas. The term PFC is used to describe both the assessment process, and a defined, on-the-ground condition of a riparian area. The on-the-ground condition termed PFC refers to how well the physical processes are functioning. PFC is a state of resiliency that will allow a riparian area to hold together during high flow events with a high degree of reliability. The assessment of these sites was done following the guidance and checklist provided in Technical Reference 1737-9. Three ratings are possible within the PFC protocol; Non-functional (NF), Functioning at Risk (FAR), and Properly Functioning

Condition (PFC). Sites that received a rating of PFC were considered to be meeting Standard 2. Sites rated as NF, or FAR were considered to be not meeting Standard 2.

iii. Methodology used to evaluate Standard 3 – Stream Channel/Floodplain.

Riparian proper functioning condition (PFC) was utilized as a qualitative method for assessing the condition of riparian and wetland areas. The term PFC is used to describe both the assessment process, and a defined, on-the-ground condition of a riparian area. The on-the-ground condition termed PFC refers to how well the physical processes are functioning. PFC is a state of resiliency that will allow a riparian area to hold together during high flow events with a high degree of reliability. The assessment of these sites was done following the guidance and checklist provided in Technical Reference 1737-9. Three ratings are possible within the PFC protocol; Non-functional (NF), Functioning at Risk (FAR), and Properly Functioning Condition (PFC). Sites that received a rating of PFC were considered to be meeting Standard 3. Sites rated as NF, or FAR were considered to be not meeting Standard 3.

iv. Methodology used to evaluate Standard 4 – Native Plant Communities.

Native Plant Communities were evaluated using the results of the Biotic Integrity attribute from the Land Health Assessment, as well as extra data such as utilization levels, utilization photos, field observations and professional judgment, were also used to determine standard status; meeting or not meeting. Typically, ratings of none to slight or slight to moderate for the attribute were considered to be meeting Standard 4. Ratings of moderate to extreme or extreme to total for the attribute were considered to be not meeting Standard 4. Ratings of moderate for the attribute were further reviewed. The status of the standard was then assigned for the site based on the review of additional information. In all cases the preponderance of evidence was used to make the final determination.

v. Methodology used to evaluate Standard 5 – Seedings.

Seedings were evaluated using the results of the Biotic Integrity attribute from the Land Health Assessment, as well as utilization levels, utilization photos, field observations and professional judgment. This information was used to determine if the standard was being met or not met. Typically, ratings of none to slight or slight to moderate for the attribute were considered to be meeting Standard 5. Ratings of Moderate to extreme or extreme to total for the attribute were considered to be not meeting Standard 5. Ratings of moderate for either attribute were further reviewed. The status of the standard was then assigned for the site based on the review of additional information. In all cases the preponderance of evidence was used to make the final determination.

vi. Methodology used to evaluate Standard 7 – Water Quality.

In 2010, the Idaho Division of Environmental Quality (DEQ) assessed water quality and identified a state-wide list (the “303(d)” list) of water quality-limited streams and water bodies on Idaho public lands in response to section 303(d) of the Clean Water Act. Assessment of water quality on public lands is based on meeting beneficial uses with regards to stream/riparian habitat and using biological species as indicators. The DEQ subsequently published the Idaho’s 2010 Integrated Report, Final, August 2011.

vii. Methodology used to evaluate Standard 8 – Threatened and Endangered Plants and Animals.

Habitat for threatened and Endangered Animals were assessed using the Habitat Assessment Framework outlined in the Sage-Grouse Habitat Assessment Framework Volumes I-III, August 2010 with Updates from the Sage-Grouse Habitat Assessment Framework Workshop held in May 2013. The land was divided into Breeding Habitat, Summer Habitat, or Winter Habitat. The assessment process categorizes sites as suitable, marginal, or unsuitable. Suitable sites were considered to be meeting Standard 8, unsuitable sites were considered to not be meeting Standard 8. Extra information such as utilization data, utilization photos, field

observations and professional judgment were used to determine standard status, meeting or not meeting, for ratings of marginal.

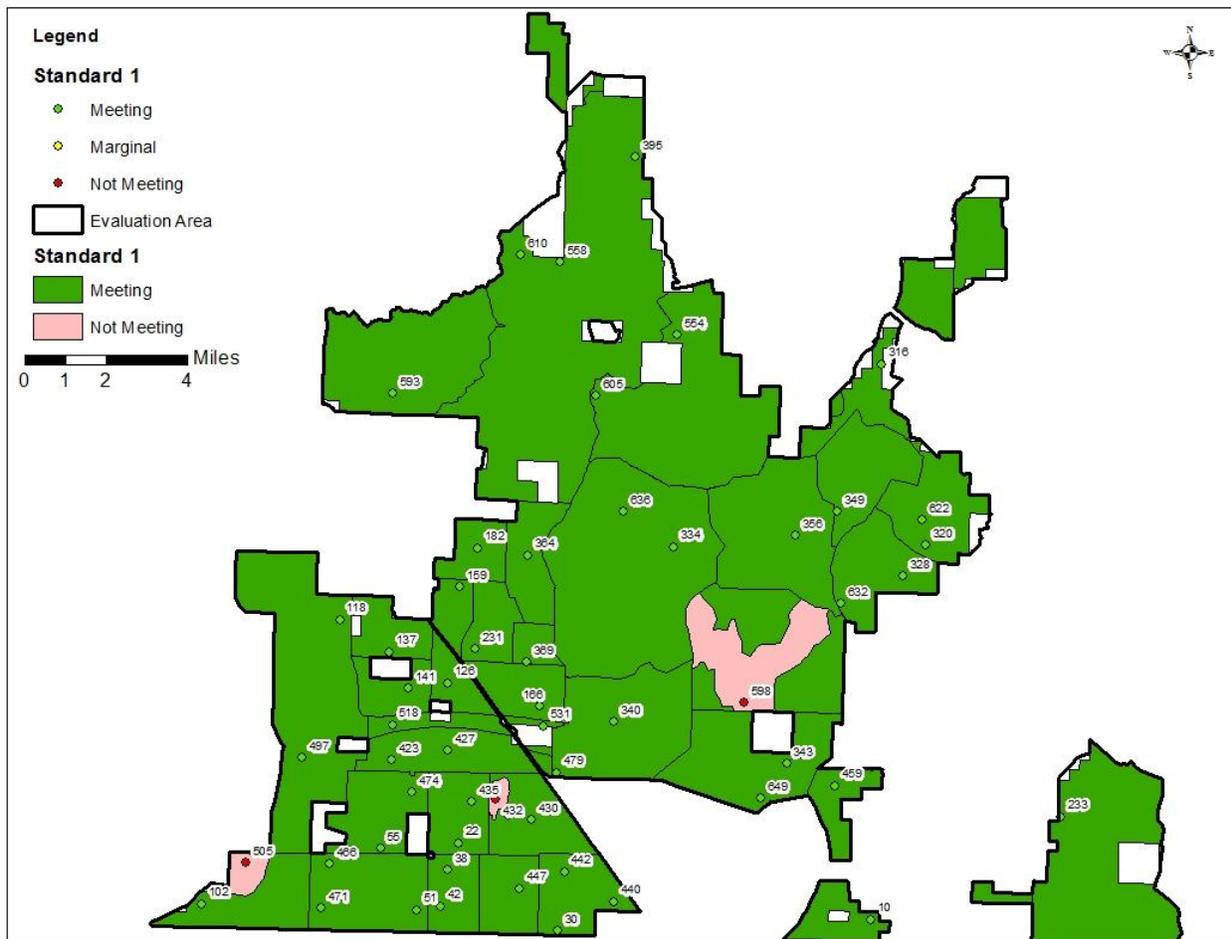
Land devoid of sagebrush was typically considered not meeting Standard 8.

A. 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.” (USDI 1997)

Of the approximately 134,241 acres within the evaluation area, approximately 130,211 acres are meeting Standard 1 (Watersheds). The remaining 4,030 acres not meeting Standard 1 occur within three pastures. Figure 4.3 shows those 36 pastures meeting and three pastures not meeting Standard 1. A summary of the seventeen indicators and three attributes associated with Interpreting Indicators of Rangeland Health can be found in Appendix A, Indicators of Rangeland Health. Photos of the plots visited in 2013 can be found in Appendix E, Sage Grouse Habitat Studies, 2013 Sage Grouse Habitat and Land Health Assessment Photos.

Figure 4.3: Evaluation status of Standard 1 within the evaluation area.



All of the pastures are meeting Standard 1 except those listed in Table 4.1 below.

Table4.1: Evaluation Status for Pastures within the Curlew Allotment for Standard 1.

| Pasture | Total Acres | % Meeting Standard | % Not Meeting Standard |
|-------------------------|-------------|--------------------|------------------------|
| North Brush | 2,556 | 90% | 10% |
| North Canyon South Half | 6,917 | 53% | 47% |
| West Black Pine | 3,143 | 82% | 18% |

Meeting Rational: In general, soils across the evaluation area have sufficient vegetative cover to protect soils and watershed stability in both the upland, native plant communities, and in the rangeland seedings. The Land Health Evaluation conducted in 2013 found that litter cover ranged from 55% to 67% throughout the seeded area and between 42% and 63% within the native vegetation area; Appendix F, Table F-6 and F-7. This amount of litter cover exceeds what would be expected for all ecological site descriptions found within the evaluation area. This increased litter aids in the protection of the soil surface to rain drop impact and in infiltration.

Soil stability Tests were performed in conjunction with the Land Health Evaluation and HAF data collection. According to these tests, Soil stability within the seeded portions of the evaluation area tended to be within the expected range of variation or just below what would be expected. Within the native portion of the evaluation area the soil stability test also tended to be within the expected range of variation or just below what would be expected. For the areas that are meeting indicators for pedestalling, rills and gullies were rated none to slight to slight to moderate.

Not Meeting Rational: The evaluation found that lack of vegetative cover is the primary reason for not meeting this standard. The lack of cover caused increased susceptibility of the soils to erosion.

North Canyon South Half

According to the Land Health Assessment, 53% (3,698 acres) of the North Canyon South Half pasture is meeting Standard 1 (Watersheds) and 47% (3,219 acres) is not meeting the standard because ground cover is less than expected for the site. Both shrubs and perennial bunch grasses are reduced. The soil surface is thus vulnerable to erosional processes with movement of surface fines observed.

The reduction of plant cover is attributed to a number of factors including a lack of fire on the landscape in the past which led to an increase in the distribution and abundance of junipers on the landscape. This led to a reduction in shrub and grass components due to increased competition with junipers. Due to recent fire activity junipers have been lost on the landscape.

North Brush

According to the Land Health Assessment, 90% (2,308 acres) of the North Brush pasture is meeting Standard 1 (Watersheds) and 10% (247 acres) is not meeting standard due to a lack of herbaceous and woody vegetation to protect the soil. Pedestalling was also observed and the amount and distribution of bare ground is greater than expected.

The lack of shrub cover is the result of recent fire activity (Juniper Fire 2011). The decreased bunchgrass cover and the increased bare ground may be attributed to utilization of herbaceous cover by livestock.

West Black Pine

Approximately 82% (2,492 acres) of the West Black Pine pasture is meeting Standard 1 (Watersheds) and 18% (564 acres) is not meeting standard due to a lack of shrubs (leading to a lack of snow capture and a decrease in infiltration). Water is not being retained on the site as evidenced by a moderate amount of flow patterns and active pedestalling. Soil movement was evident within two large active gullies occurring within the northwest corner of the pasture.

The lack of shrub cover is attributed to recent fire activity. The gradient and lack of shrub canopy cover has led to increased susceptibility to water flows.

Causal Factors for not Meeting:

Wildfire Influence: All of the sites that are not meeting the standard were burned in the 2006/2007 wildfires. Of the areas not meeting, 3,698 acres was dominated by junipers that had invaded the site prior to the fires. The presence of juniper had reduced native vegetation causing a reduced capability for herbaceous vegetation to quickly establish following fire; leading to increased soil erosion susceptibility. The remaining areas that burned had a shrub over story with varying amounts of herbaceous understory. The loss of the over story increased the erosion susceptibility.

Livestock Management: Utilization of herbaceous species within the North Brush pasture (247 acres) was noted as a contributing factor for the susceptibility of the soil to erosion.

B. Standard 2- Riparian Areas and 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.” (USDI 1997)

A total of 16 springs are known to occur within the evaluation area. In 2011, 2 perennial streams and 11 riparian areas associated with springs were assessed using the PFC protocol. Six riparian areas associated with springs were not assessed at that time. The evaluation sheets and photos from the 2011 PFC evaluation are located in Appendix C, PFC Evaluations. Of the 16 springs within the evaluation area, only six riparian areas were evaluated for Standard 2. The remaining 10 springs are highly developed and lack surface waters and riparian vegetation. The Holbrook, Little Rock, Lost and Rose springs will be addressed here while the Meadow Brook and North Canyon Creeks will be addressed under Standard 3 (Stream Channel/Floodplain).

Figure 4.4: Overview of Riparian Areas Assessed for standard 2.

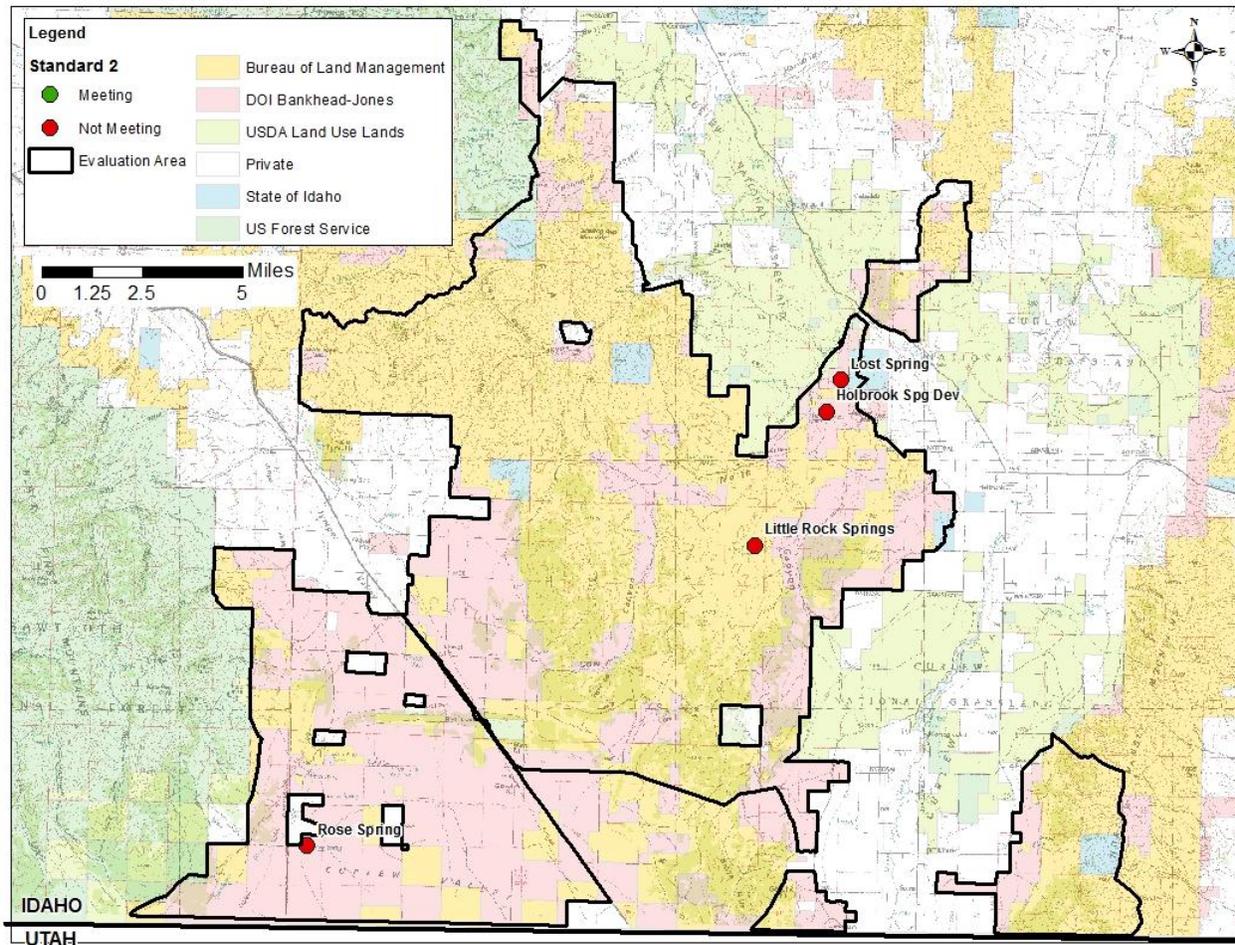


Table 4.2: Evaluation Status for Pastures within the evaluation area for Standard 2.

| Riparian Area | Evaluation Status |
|-------------------------|-------------------|
| Holbrook (enclosure) | Not Meeting |
| Little Rock (enclosure) | Not Meeting |
| Lost | Not Meeting |
| Rose (enclosure) | Not Meeting |

Meeting Rational: Not applicable.

Not Meeting Rational: There are several lentic riparian areas within the allotment, none of which are meeting the standard. Riparian areas associated with lotic systems are addressed in Standard 3. The amount and variety of riparian species was a major concern at most of the riparian areas. Other issues centered on soil compaction, shearing, increased sedimentation, and reduced soil stability.

Holbrook Spring:

Holbrook Spring is located within the Meadow Brook Divide Pasture. This is a developed spring and part of a flow through system. The spring head and overflow area are both protected by enclosures and the overflow enclosure was extended in 2012. The spring head, trough and overflow areas are all located within the confines of a drainage with the trough placed between the spring head and the overflow area. According to the 2011 PFC evaluation, Holbrook Spring is functional at risk (FAR). The 2011 PFC evaluation found that there is adequate riparian vegetation that exhibit high vigor, that the system is vertically stable, and the stream banks are adequately protected by riparian vegetative cover. However, it also noted that the

immediate upland watershed may be contributing to riparian degradation and that the stream is not in balance with the water and sediment being supplied by the watershed.

The increased sediment load and impaired upland watershed may be attributed to the troughs location between the spring head and overflow area, all of which are within the confines of a narrow drainage. The design and location of the range improvements associated with the spring are affecting the hydrology of the system.

Little Rock Spring:

Little Rock Spring is located within the North Canyon Pasture. This is a developed spring that feeds a trough located within 50 feet of the riparian enclosure. The development is a flow through system. The enclosure encompasses approximately 5 acres. According to the 2011 PFC evaluation, Little Rock Spring is non-functional (NF). The 2011 PFC evaluation found that the riparian area was not widening, and lacked sinuosity. Riparian vegetation was also found to be lacking in both composition and age-class distribution. The riparian protection enclosure was in serious disrepair at the time of the evaluation. The evaluation noted hoof prints and compaction of the bottoms. The fence has since been repaired.

The lack of riparian vegetation is attributed to decreased water retention at the spring source. The compaction and hoof shearing appears to be due to the disrepair of the protection enclosure.

Lost Spring:

The riparian area associated with Lost Spring extends minimally beyond the protective enclosure. According to the 2011 PFC evaluation, Lost Spring is non-functional (NF). According to the 2011 PFC evaluation this riparian area for all practical purposes existed only within the protective enclosure (300 x 300 ft.), therefore, it lacked sinuosity, was not widening or achieving its potential extent, lacked a diverse composition of riparian vegetation, and lacked adequate sources of coarse woody material. This spring is developed and part of a flow through system.

The lack of riparian vegetation is attributed to decreased water retention at the spring source and the limited size of the protection enclosure.

Rose Spring:

Rose Spring is located within South Black Pine Pasture. This is a developed spring that feeds two troughs and overflows into a stock pond. This is a flow through system. The spring head is located within an enclosure encompassing approximately 3 acres. The 2011 PFC evaluation found that the spring was functional at risk (FAR). It was observed that inside the enclosure riparian vegetation was adequate to protect banks and disperse energy during high flow events but not outside the enclosure. It was noted that riparian vegetation was not present outside the enclosure. Riparian vegetation such as cattails and sedges do occur within the enclosure (observations apart from PFC evaluation). The PFC evaluation noted that some sedge species are present within the stock ponds.

The lack of riparian vegetation outside the enclosure may be attributed to decreased water retention at the spring source and or livestock use. It may also be attributed to the location of the trough, which is in close proximity to the riparian enclosure and a natural livestock congregational area.

Causal Factors for not Meeting:

Range Improvements: All of the water sources have been developed into range improvements designed for watering livestock. The majority of the developments are designed as a flow through system, collecting water at the source, piping it to a trough and then piping the overflow to a manmade pond or to a natural drainage. Under this system, water is continually drawn from the ground source modifying the riparian

potential of each site. Artificial riparian areas have developed as a result of surface waters associated with overflow water from the troughs. Fencing to protect the water sources have been constructed, however several are too small to protect the entire riparian area or have fallen into disrepair. The location of troughs associated with the water developments is often near the source increasing livestock pressure on protection fences.

Livestock Management: Livestock use of natural riparian areas that are not protected by enclosures is leading to compaction and shearing of soils associated with those riparian areas. Location of the troughs associated with the developed water sources often concentrates cattle near surface waters and riparian areas.

C. 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.” (USDI 1997)

A total of 6 springs have associated stream channels but only two lotic systems occur within the evaluation area and include the Meadow Brook and North Canyon streams. The Meadow Brook system rated Proper Functioning Condition (PFC) and the North Canyon system rated Functioning At Risk with an upward trend. The North Canyon system is fenced and is making progress toward PFC. The evaluation sheets and photos from the 2011 PFC evaluation are located in Appendix C, PFC Evaluations.

Three other stream channels were not evaluated and are depicted as grey lines in figure 4.5 above. Two of the stream reaches, Crazy Canyon and Pipeline, were not evaluated because they are dry intermittent streams that rarely contain flowing water. The third stream reach, West Black Pine, was not evaluated because it is an abandoned ditch.

Figure 4.5: Overview of stream channels and floodplains assessed for standard 3.

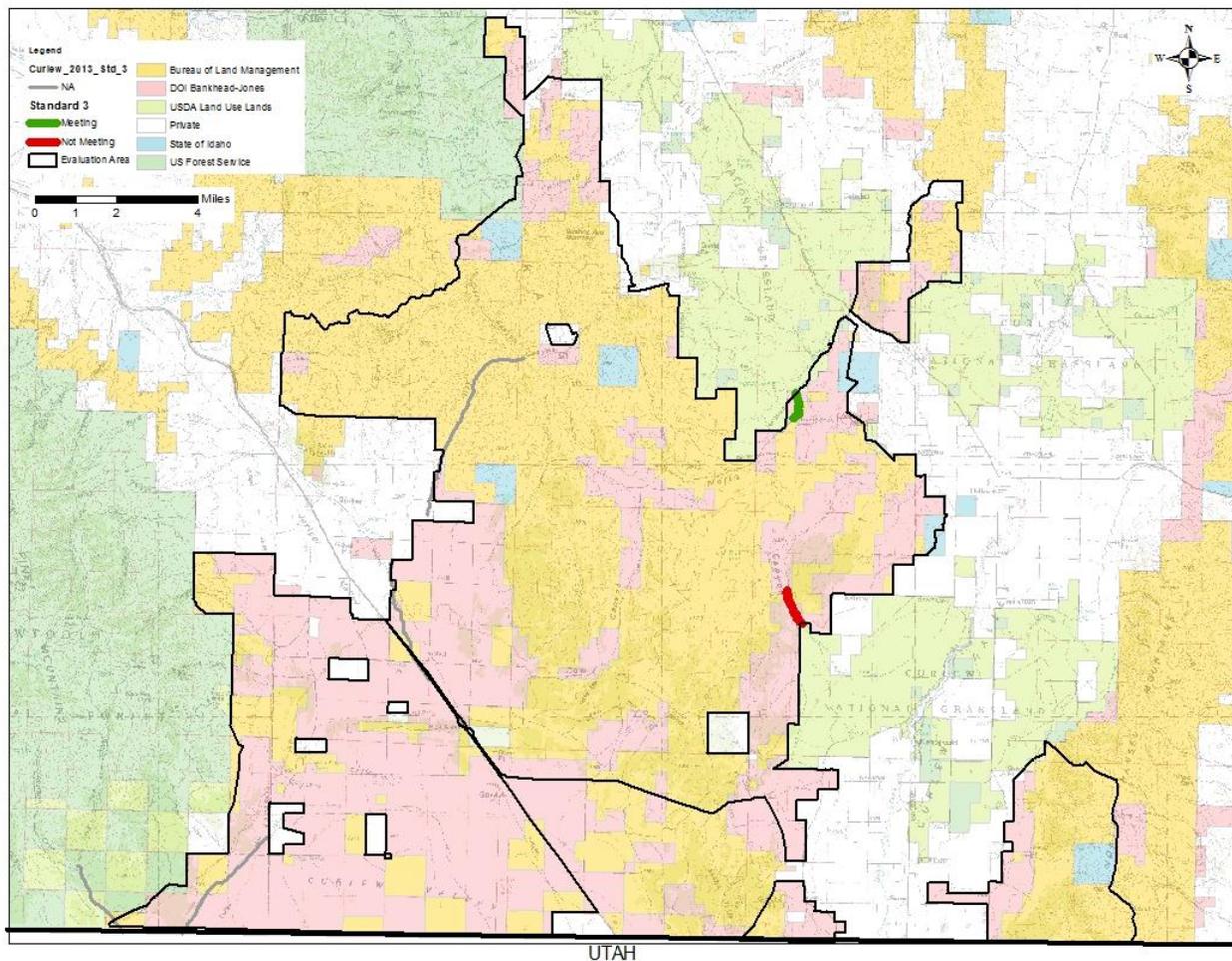


Table 4.3: Evaluation Status for Riparian Areas within the evaluation area for Standard 3.

| Riparian Area | PFC | Evaluation Status |
|--------------------------|------------------|--|
| Meadow Brook | PFC | Meeting |
| North Canyon (enclosure) | FAR upward trend | Not Meeting (making progress toward meeting) |

Meeting Rational: The Meadow Brook Creek was found to be at PFC during the 2011 PFC studies. The study concluded that the creek had a diverse composition of riparian vegetation, including willows, cattails, sedges, and rushes; the sinuosity of the creek was in balance with the landscape and the creek was in balance with the water and sediment being supplied by the watershed.

Not Meeting but Making Progress Towards Rational: The North Canyon Spring and Stream historically down cut and created a deep trench that is minimally covered with upland vegetation which is resulting in increased sedimentation into the system. Currently the system is vertically stable with no evidence of active down cutting. The current flood plain has abundant riparian vegetation, including willows, sedges and rushes, which are intercepting some of the incoming sediment. It appears this increased sediment may be building a new flood plain.

North Canyon Spring and Stream:

North Canyon Spring is located within the North Canyon Pasture. This is a developed spring and the water is used by both the BLM and the USFS. The water from the spring is pumped to a storage tank and then distributed to several troughs. It is a flow through system. The spring and the subsequent creek are within a

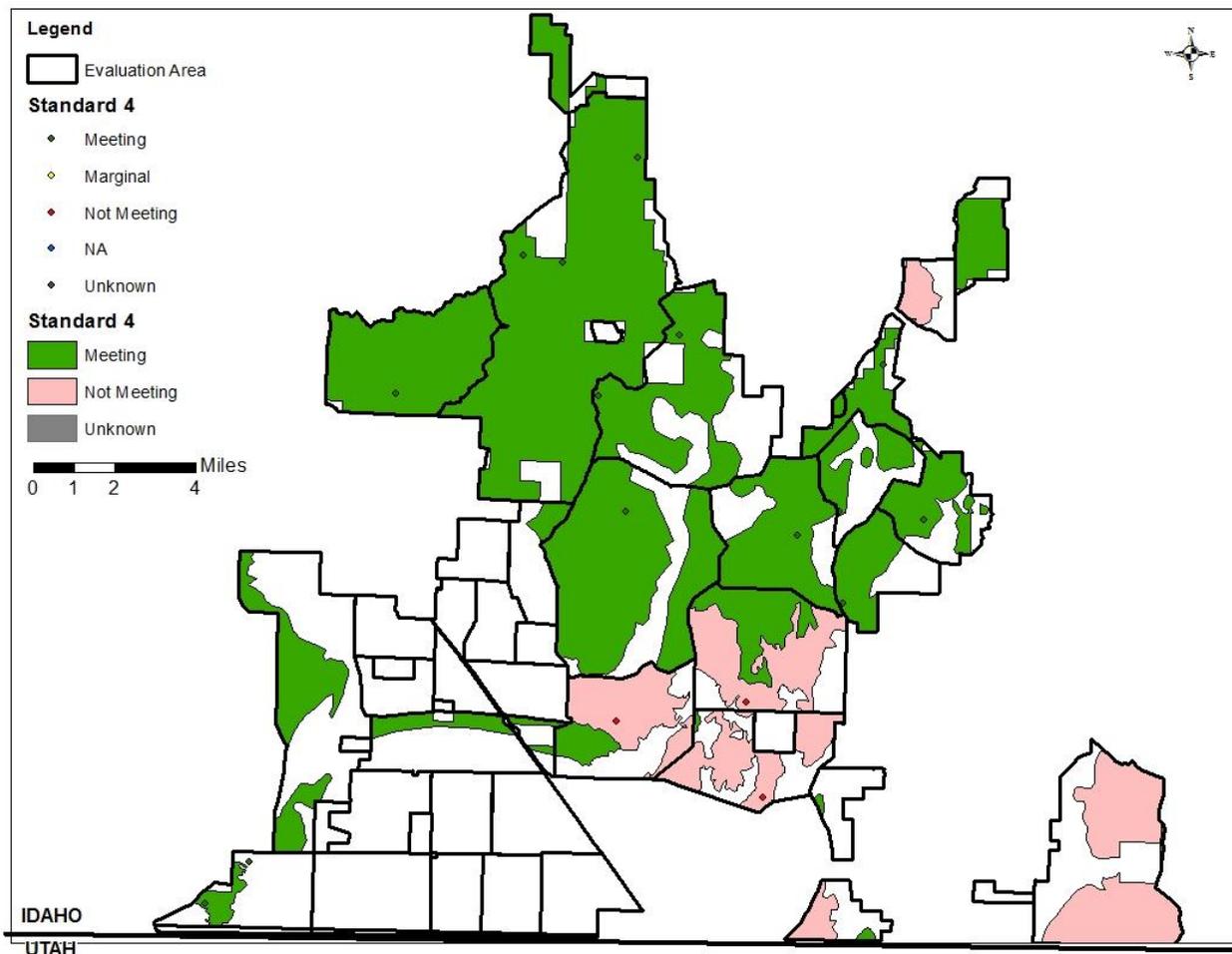
riparian enclosure. The 2011 PFC evaluation found that the spring was functional at risk. The creek is confined in a 30 foot deep trench which reduces sinuosity, and widening. It also stated that the sides of the trench are mostly bare and are contributing to increased sediment rates. The evaluation found that the riparian vegetation was adequate in both composition and age-class distribution. It also noted that the transplanted willows appeared to be spreading and ranged in height from 1 to 20 feet tall.

D. 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.” (USDI 1997)

Of the approximately 134,241 acres within the evaluation area, native vegetation occurs on approximately 57% (75,858 acres). Of the approximate 75,858 acres on which native vegetation occurs, approximately 60,291 acres are meeting Standard 4 (Native Plant Communities). The remaining 15,567 acres are not meeting Standard 4 and occur within six pastures. Figure 4.6 below shows those areas in red that were assessed and are not meeting Standard 4. A summary of the seventeen indicators and three attributes associated with Interpreting Indicators of Rangeland Health can be found in Appendix A, Indicators of Rangeland Health. Photos of the random plots visited in 2013 can be found in Appendix E, Sage Grouse Habitat Studies, 2013 Sage Grouse Habitat and Land Health Assessment Photos.

Figure 4.6: Evaluation status of Standard 4 within the evaluation area.



All of the pastures are meeting Standard 4 except those listed in Table 4.4 below.

Table 4.4: Evaluation Status for Pastures within the Curlew Allotment for Standard 4.

| Pasture | Total Acres | % Meeting Standard | % Not Meeting Standard | % Not Applicable |
|-------------------------|-------------|--------------------|------------------------|------------------|
| Bowhuis | 3,358 | 23% | | 77% |
| Cove | 5,201 | 14% | 56% | 30% |
| Cove Burn | 4,340 | 1% | 62% | 37% |
| Cow Hollow | 11,226 | 82% | | 18% |
| Crazy Canyon | 17,879 | 100% | | |
| East Cedar Hill | 1,516 | 100% | | |
| Glen Canyon | 6,210 | 100% | | |
| Grandine | 7,627 | 0% | 69% | 31% |
| Haliday 2 | 1,979 | 19% | | 81% |
| Holbrook Burn | 2,961 | 47% | | 53% |
| Meadow Divide | 1,532 | 100% | | |
| North Bowen | 2,934 | 69% | | 31% |
| North Canyon North Half | 5,631 | 75% | | 25% |
| North Canyon South Half | 6,917 | 31% | 49% | 20% |
| Rest Stop | 354 | 62% | | 38% |
| Roe | 1,388 | 5% | 42% | 53% |
| South Bowen | 2,853 | 69% | | 31% |
| Stone | 1,325 | 4% | | 96% |
| Trail Canyon | 8,415 | 61% | | 39% |
| Van Koman | 8,645 | 37% | | 63% |
| West Black Pine | 3,056 | 17% | | 83% |
| West Cedar Hill | 1,364 | 0% | 52% | 48% |

Meeting Rational: Native vegetation composes approximately 56% of the evaluation area. The majority of which has adequate species diversity and cover for proper ecological functioning condition. Within those areas meeting Standard 4 cover studies conducted in 2013 found that native grass cover averaged 29% and ranged between 9% and 61%. Forb cover averaged 8% and ranged between 1% and 23%. These averages are within the expected range of variation for the represented ecological sites. Cheatgrass cover averaged 2% and ranged from 0 to 10%, while only one study site recorded any weedy species (1% cover). Land Health Assessment (2013) and comparative utilization photos from 2012 show a diverse species composition, both woody and herbaceous within the native portions of the pastures.

Not Meeting Rational: The areas not meeting this standard showed a high level of departure in vegetative composition from what would be expected within the ecological site. These areas occurred in sites that should have shrubs and grasses as the dominant vegetation. The existing vegetation varies within the areas not meeting the standard ranging from juniper dominated sites, areas of high invasive species cover, or lack of vegetation with high bare ground.

Cove

The Cove pasture is a mixture of native vegetation and seedings, therefore Standard 4 (Native Plant Communities) does not apply to 30% (1,574 acres). Based on the 2013 LHA and HAF studies as well as recent utilization studies, photos and field visits, it was determined that 56% of the native plant community within the Cove Pasture is not meeting Standard 4. This is due to an abundance of cheatgrass (*Bromus tectorum*) and other invasive species, a reduction in bunchgrasses and an increase in a shallow rooted rhizomatous grass species and a lack of shrubs, especially sagebrush species.

The area was dominated by juniper prior to the 2006-2007 fires. This dominance of junipers led to a reduction of native vegetative species that would be expected for the site. Following the fires of 2006-2007,

cheat grass and invasive species have increased. Primary causal factor for not meeting is attributed to burning of previous juniper encroachment.

Cove Burn

The Cove Burn pasture is a mixture of native vegetation and seedings, therefore Standard 4 (Native Vegetation Communities) does not apply to 37% (1,606 acres). According to the LHA conducted in 2013 of the remaining 63% of the pasture, only 1% (43 acres) of the pasture is meeting Standard 4; the remaining 62% (2,691 acres) is not meeting. The assessment found that the diversity of the native species is not being maintained, that shrubs, especially sagebrush species are lacking, as well as forbs and in some areas native bunch grasses. It also found that reproductive capability is reduced and the annual production of species is less than expected. Populations of cheatgrass (*Bromus tectorum*) are prevalent throughout the site. The majority of the native plant community possessed either live juniper or juniper skeletons.

The area was dominated by juniper prior to the 2006-2007 fires. This dominance of junipers led to a reduction of native vegetative species that would be expected for the site. Following the fires of 2006-2007, cheat grass and invasive species have increased. Primary causal factor for not meeting is attributed to burning of previous juniper encroachment.

Grandine

The Grandine pasture is a mixture of native vegetation and seedings therefore Standard 4 (Native Vegetation Communities) does not apply to 31% (2,360 acres). Based on aerial photography and field visits of the native portion of the pasture it was determined that none (5,267 acres) of the native portions were meeting standard. The diversity of native plant species are not maintained, shrubs are lacking and forbs and native bunchgrasses are reduced in abundance. The primary factor for the non-attainment is the encroachment and dominance of junipers within a sagebrush steppe ecological site.

North Canyon South Half

The South Half of the North Canyon pasture is a mixture of native vegetation and seedings, therefore Standard 4 does not apply to 20% (1,383 acres). According to the Land Health Assessment conducted in 2013 of the remaining 80% of the pasture, only 31% (2,144 acres) of the pasture were found to be meeting Standard 4. The remaining 49% (3,389 acres) of the pasture is not meeting Standard 4. The assessment determined that the diversity of native plant species were not maintained, that shrubs were lacking, especially sagebrush species, and that forbs and native bunchgrasses were also reduced in abundance. In addition, reproductive capability and annual production were less than expected. The majority of the native plant community possessed either live juniper or juniper skeletons.

The area was dominated by juniper prior to the 2006-2007 fires. This dominance of junipers led to a reduction of native vegetative species that would be expected for the site. Following the fires of 2006-2007, cheat grass and invasive species have increased. In areas where pockets of live junipers remain, native vegetation as described in the ecological site description is reduced and juniper, which is not expected on the site, is prevalent. Primary causal factor for not meeting is attributed to burning of previous juniper encroachment.

Roe

The Roe pasture is a combination of native vegetation and seedings. Standard 4 (Native Plant Communities) applies to 47% (657 acres). According to the Land Health Assessment conducted in 2013 of the remaining 53% of the pasture, only 5% (69 acres) of the pasture was found to be meeting Standard 4. The remaining 41% (603 acres) is not meeting. The diversity of native plant species are not maintained, shrubs are lacking and forbs and native bunchgrasses are reduced in abundance. The primary factor for the non-attainment is the encroachment and dominance of junipers within a sagebrush steppe ecological site.

West Cedar Hills

The West Cedar Hills pasture is a mixture of native vegetation and seedings therefore Standard 4 (Native Vegetation Communities) does not apply to 48% (653 acres). Based on aerial photography and utilization studies of the native portion of the pasture it was determined that none (711 acres) of the native portions were meeting standard. The diversity of native plant species are not maintained, shrubs are lacking and forbs and native bunchgrasses are reduced in abundance. The primary factor for the non-attainment is the encroachment and dominance of junipers within a sagebrush steppe ecological site.

Causal Factors for not Meeting:

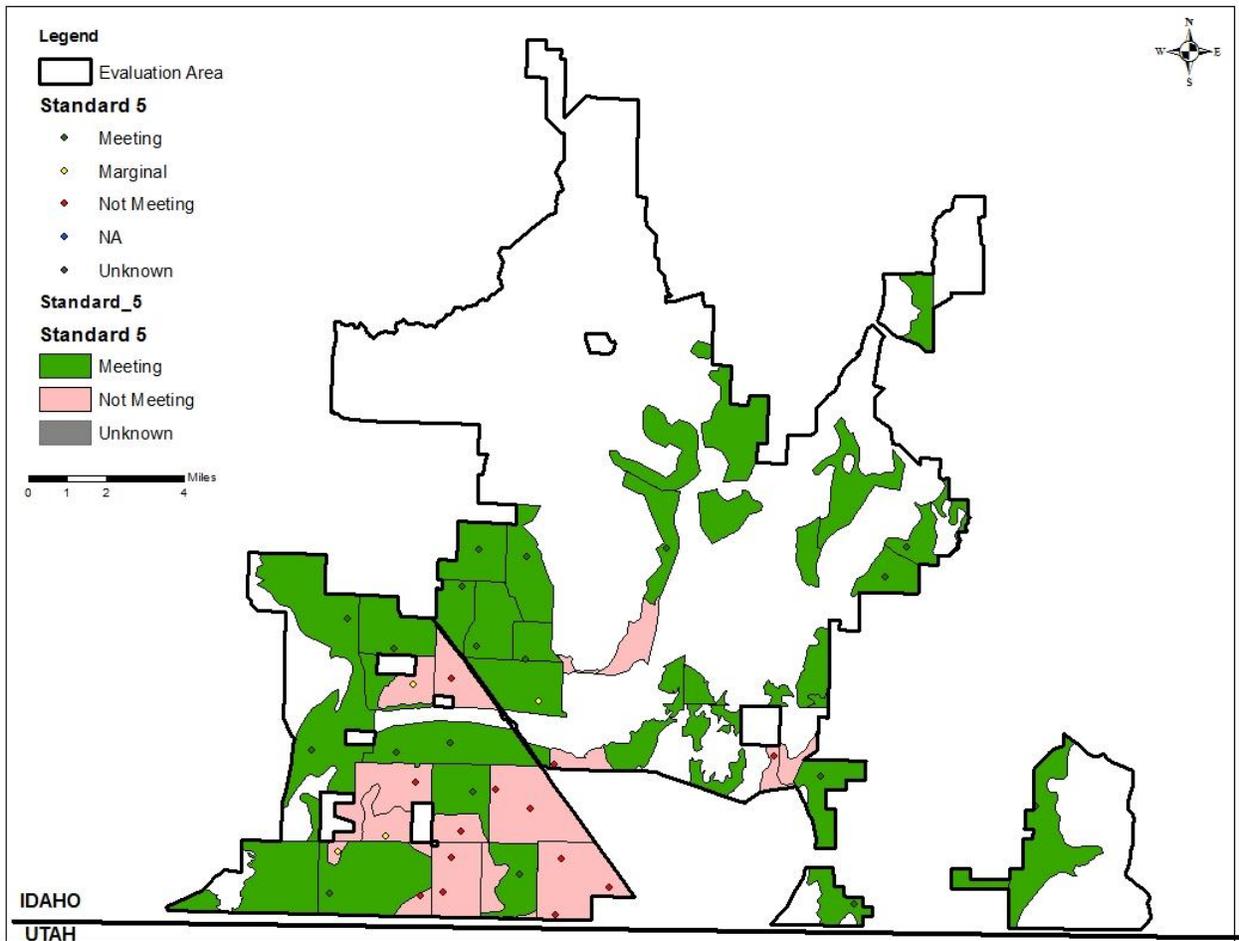
Juniper Encroachment & Wildfire: The areas not meeting this standard either were or are dominated by juniper; however the ecological site description shows that they should be dominated by shrubs and grasses. The encroachment of juniper led to a reduction of native vegetative species that would be expected for these sites. The majority of these areas burned in the 2006/2007 fires resulting in increased invasive species presence and poor native vegetation recovery. The dominance of juniper continues to exist on 603 acres within the Roe pasture.

E. 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.” (USDI 1997)

Of the approximately 134,241 acres within the evaluation area, approximately 43% (58,390 acres) are seedings. Crested wheatgrass is the dominant seeded species. Of the approximate 58,390 acres of seedings, approximately 43,945 acres are meeting Standard 5 (Seedings). The remaining 14,445 acres are not meeting Standard 5 and occur within 12 pastures. Figure 4.7 below shows those areas in red that were assessed and found to be not meeting Standard 5. A summary of the seventeen indicators and three attributes can be found in Appendix A, Indicators of Rangeland Health. Photos of the random plots visited in 2013 can be found in Appendix E, Sage Grouse Habitat Studies, 2013 Sage Grouse Habitat and Land Health Assessment Photos.

Figure 4.7: Evaluation status of Standard 5 within the evaluation area.



All of the pastures are meeting Standard 5 except those listed in Table 4.5 below.

Table 4.5: Evaluation Status for Pastures within the Curlew Allotment for Standard 5.

| Pasture | Total Acres | % Meeting Standard | % Not Meeting Standard | % Not Applicable |
|-------------------------|-------------|--------------------|------------------------|------------------|
| Antelope | 1,561 | | 100% | |
| Bowhuis | 3,358 | 76% | | 24% |
| Cove | 5,201 | 22% | 8% | 70% |
| Cove Burn | 4,340 | 22% | 15% | 63% |
| Cow Hollow | 11,226 | 10% | 8% | 82% |
| East Black Pine | 1,923 | 69% | 31% | |
| East State Line | 1,803 | 69% | 31% | |
| East Stocker | 1,755 | 100% | | |
| Grandine | 7,627 | 31% | | 69% |
| Grandine Pond | 323 | 100% | | |
| Haliday 1 | 1,407 | 100% | | |
| Haliday 2 | 1,979 | 81% | | 19% |
| Holbrook Burn | 2,961 | 53% | | 47% |
| North Black Pine | 2,471 | | 100% | |
| North Bowen | 2,934 | 31% | | 69% |
| North Brush | 2,556 | | 100% | |
| North Canyon North Half | 5,631 | 25% | | 75% |
| North Canyon South Half | 6,917 | 20% | | 80% |
| North Mills | 1,497 | 100% | | |
| Pipeline | 920 | 100% | | |

| Pasture | Total Acres | % Meeting Standard | % Not Meeting Standard | % Not Applicable |
|------------------|-------------|--------------------|------------------------|------------------|
| Rest Stop | 354 | 38% | | 62% |
| Roe | 1,388 | 53% | | 47% |
| Section 24 | 665 | 100% | | |
| South Black Pine | 3,534 | 86% | 14% | |
| South Bowen | 2,853 | 31% | | 69% |
| South Brush | 2,329 | | 100% | |
| South Mills | 1,299 | 40% | 60% | |
| Stone | 1,325 | 96% | | 4% |
| Trail Canyon | 8,415 | 39% | | 61% |
| Van Koman | 8,645 | 63% | | 37% |
| West Black Pine | 3,056 | 83% | | 17% |
| West Stocker | 1,068 | | 100% | |
| West Cedar Hill | 1,364 | 48% | | 52% |
| Wight | 1,376 | 100% | | |

Meeting Rational: Within those areas meeting Standard 5 cover studies conducted in 2013 found that crested wheatgrass cover averaged 28% and ranged between 3% and 44%. Within those areas with lower crested wheatgrass cover (3%) there was a high percent cover of native perennial grasses (27%). Examples include Van Koman pasture Plot 497 (Appendix F). Invasive annul cover was found to occur at one of twenty Land Health Assessment sites and was recorded at 2%. Utilization photos from several years indicate that many of the seedings are comprised of abundant, healthy crested wheatgrass plants. Some of these seedings have remained monocultures of crested wheatgrass while others had been recolonized by shrubs such as sagebrush and rabbitbrush at varying densities. Of those areas where shrubs recolonized, nearly 40% have been burned recently. Within these burnt portions, crested wheatgrass cover averages 30% while within the unburnt portion crested wheatgrass cover averages 26%. All areas meeting this standard have vigorous plants producing seed.

Not Meeting Rational: The seedings within the allotment vary in age (re: when they were planted) and location. The locations of the seedings determine the soil type into which they were planted and climatic influences. There were three primary reasons for seeded areas not meeting the standard which included: reduced abundance/presence of seeded species, elevated presence of invasive species, and reduced vigor of seeded species. One or a combination of these reasons occurred within each area.

Antelope

The Antelope pasture is a seeding within an alkali flat ecological site. According to the LHA conducted in 2013, the entire pasture (1,561 acres) is not meeting Standard 5. There is a reduction or loss of the seeded species throughout the majority of the pasture. Invasive species such as cheatgrass (*Bromus tectorum*), halogeton (*Halogeton glomeratus*), and bur buttercup (*Ranunculus testiculatus*) are extensive throughout the pasture. The reduction of seeded species (crested wheatgrass) is likely attributed to the ecological site in which it was planted. The entire pasture is mapped as an alkali flat with an annual precipitation of 8 to 12 inches per year. An enclosure within the pasture which has not been grazed is not appreciably different than the grazed area.

Cove

The Cove pasture is a combination of native vegetation and seedings. Approximately 22% (1,133 acres) of the pasture is meeting Standard 5; the remaining 8% (441 acres) is not. In those areas not meeting Standard 5, the production and vigor of the seeded species (crested wheatgrass) is less than expected, cheatgrass (*Bromus tectorum*) is common and bare ground is greater than expected. The two influencing factors for this area are fire and grazing.

Cove Burn

The Cove Burn pasture is a combination of native vegetation and seedings. Consequently, Approximately 22% (953 acres) of the pasture is meeting Standard 5; the remaining 15% (634 acres) is not. In those areas not meeting Standard 5, the production and vigor of the seeded species (crested wheatgrass) is less than expected, and cheatgrass (*Bromus tectorum*) is common. This site burned which likely increased the presence of invasive species. The reduced vigor of plants in this area appears to be due to drought in combination with grazing. Review of grazing use and management shows that grazing has occurred within or below the utilization limits.

Cow Hollow

The Cow Hollow pasture is a combination of native vegetation and seedings. Approximately 10% (1,123 acres) of the pasture is meeting Standard 5; the remaining 8% (898 acres) is not. It appears the abundance and vigor of seeded species (crested wheatgrass and intermediate wheatgrass) is declining based on several years of utilization photos and field observations.

The location of the livestock watering sites and topography of the pasture concentrates livestock within this area and is likely contributing to the reduction and vigor of seeded species.

East Black Pine

Standard 5 (Seedings) applies to the entire East Black Pine pasture (1,923 acres). According to the LHA conducted in 2013, 69% (1,318 acres) is meeting Standard 5. The remaining 31% (605 acres) is not meeting Standard 5 and is planted within an Alkali Flat 8-12 ATCO-SAVE/ELEL5 ecological site. In those areas not meeting Standard 5 there is a severe loss of the seeded species (crested wheatgrass). Also, invasive annuals, such as cheatgrass (*Bromus tectorum*) and halogeton (*Halogeton glomeratus*) comprise the dominate source of herbaceous cover for the site. Shrub species provide a slight increase in cover on the majority of the pasture except the southwest corner where shrub cover increases dramatically.

The reduction of seeded species (crested wheatgrass) is likely attributed to the ecological site in which it was planted. The entire pasture is mapped as an alkali flat with an annual precipitation of 8 to 12 inches per year. An enclosure within the pasture which has not been grazed is not appreciably different than the grazed area.

East State Line

Standard 5 (Seedings) applies to the entire East State Line pasture (1,803 acres). According to the LHA conducted in 2013, 69% (1,239 acres) is meeting Standard 5. The remaining 31% (564 acres) is not meeting Standard 5. The 564 acres not meeting Standard 5 were based on soil mapping, utilization photos and field observations. The portion of the pasture not meeting Standard 5 has an underlying alkali soil profile, where seeded species such as crested wheatgrass diminish in abundance, distribution and vigor.

The reduction of seeded species (crested wheatgrass) is likely attributed to the ecological site in which it was planted. The western portion of the pasture is mapped as an alkali flat with an annual precipitation of 8 to 12 inches per year.

North Black Pine

Standard 5 (Seedings) applies to 100% (2,471 acres) of the pasture. According to the LHA conducted in 2013, the entire pasture (2,471 acres) is not meeting Standard 5. The seeded species, crested wheatgrass has poor vigor with many plants dying out from the center. A weak compaction layer (0.5 inches thick) was observed throughout the site. A portion of the North Black Pine pasture seedings is planted on an Alkali Flat 8-12 ATCO-SAVE/ELEL5 ecological site while the remaining portion is planted on a Loamy 8-11 ARTRT/PSSP6 ecological site with alkali soil inclusions. The reduction of seeded species (crested

wheatgrass) is likely attributed to the ecological site in which it was planted (Alkali Flat 8-12 ATCO-SAVE/ELEL5). Livestock have been stocked at a rate nearly twice that which was found to be available by the 2014 production studies.

North Brush

Standard 5 (Seedings) applies to the entire North Brush pasture (2,556 acres). According to the LHA conducted in 2013, the entire pasture is not meeting Standard 5. The seeded species, crested wheatgrass has poor vigor with many plants dying out from the center. In addition, cheatgrass, and Russian thistle are common throughout the pasture.

Livestock have been stocked at a rate nearly twice that which was found to be available by the 2014 production studies.

South Black Pine

Standard 5 (Seedings) applies to the entire South Black Pine pasture (3,534 acres). According to the LHA conducted in 2013, 86% (3,039 acres) is meeting Standard 5. The remaining 14% (495 acres) is not. The portion of the pasture which is not meeting Standard 5 is mapped as an alkali flat. Crested wheatgrass located within the interspaces of shrubs is lacking in abundance, distribution and vigor with some plants dying out from the middle. Invasive annuals, such as cheatgrass (*Bromus tectorum*), halogeton (*Halogeton glomeratus*), and bur buttercup (*Ranunculus testiculatus*) are the dominate source of herbaceous cover within areas devoid of other vegetation. The reduction and poor vigor of seeded species (crested wheatgrass) is likely attributed to the ecological site in which it was planted.

South Brush

Standard 5 (Seedings) applies to the entire South Brush pasture (2,329 acres). According to the LHA conducted in 2013, the entire pasture (2,329 acres) is not meeting Standard 5. The seeded species, crested wheatgrass is lacking on parts of the pasture and those plants that are present lack vigor. The presence of invasive annuals such as cheatgrass (*Bromus tectorum*), halogeton (*Halogeton glomeratus*), and bur buttercup (*Ranunculus testiculatus*) is at moderate to extreme departure from what is expected. It is suspected that there are inclusions of Alkali soils within the pasture that may be associated with the increased presence of halogeton. The lack of seeded species (crested wheatgrass) may be due to poor establishment at the time of the seeding. The alkali soils and grazing use likely contributes to lack of vigor.

South Mills

Standard 5 (Seedings) applies to the entire South Mills pasture (1,299 acres). According to the LHA conducted in 2013, 40% (520 acres) is meeting Standard 5 and the remaining 60% (779 acres) is not. Since it was seeded sagebrush has recolonized the entire pasture. The crested wheatgrass within the portion burnt in 2006-2007 is healthy and vigorous whereas the crested wheatgrass within the unburnt portion is lacking in abundance, distribution and vigor with some plants dying out from the middle. Where sagebrush is dominant or co-dominant crested wheatgrass is lacking vigor. The influencing factor appears to be a combination of the recolonization of sagebrush into the seeding (30% cover), and grazing.

West Stocker

Standard 5 (Seedings) applies to the entire West Stocker pasture (1,068 acres). According to the LHA conducted in 2013, the entire pasture (1,068 acres) is not meeting Standard 5. The abundance, distribution, vigor, and production potential of crested wheatgrass, is lower than expected. The influencing factor appears to be a combination of the recolonization of sagebrush into the seeding, and grazing.

Causal Factors for not meeting:

Soil Type: The seedings within the allotment were planted in a variety of soil types and associated ecological sites. Seedings that were planted in alkali soils or soils with alkali inclusions showed reduced

vigor and abundance of seeded species. It was sometimes unclear as to the actual reason for the limited presence of seeded species, however it is speculated that the initial germination success of seedlings within alkali soils was poor. Also, alkali soils were noted as a contributing factor to the reduced vigor of seeded species within the following pastures: Antelope, E. Black Pine, E. State Line, N. Black Pine, N. Brush, S. Black Pine and S. Brush. The Antelope and E. Black Pine pastures had excessive concentrations of invasive species such as Halogeton, which favors alkali soils.

Livestock Management: For the majority of the seedlings, stocking rate was found to be a contributing factor where reduced vigor was an issue. Grazing was found to be a significant causal factor in the reduced abundance and vigor within the S. Mills, W. Stocker and Cow Hollow pastures. The seedlings within the S. Mills and W. Stocker pastures have been recolonized by sagebrush leading to concentrated use of seeded species in the interspaces by livestock. The seeding in Cow Hollow shows signs of long duration use leading to reduce vigor.

Wildfire Influence: Seedlings within the Cove and Cove Burn had an elevated presence of invasive species. Shrubs had re-established within these seeding and then been removed by the 2006/2007 wildfires. The wildfires were identified as the primary reason for the increase in invasive species.

F. 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.” (USDI 1997)

This Standard does not apply to the evaluation area.

G. Standard 7- Water Quality

“Surface and ground water on public lands comply with the Idaho Water Quality Standards.” (USDI 1997)

Standard 7 requires surface and ground water on public lands to comply with the Idaho Water Quality Standards set by the Idaho Department of Environmental Quality (IDEQ).

The IDEQ lists eight stream reaches within the evaluation area as 303(d) impaired. However, the 2010 IDEQ Integrated Report determined that, except for the perennial Meadow Brook and North Canyon streams, the 303(d)-listed streams that occur within the evaluation area are classified as Dry Intermittent, with zero water flowing during at least one week of the year, and they were dry when sampled by IDEQ under the Beneficial Use Reconnaissance Program (Idaho’s 2010 Integrated Report, Final, August 2011).

The Meadow Brook and North Canyon streams are fenced from livestock and no impacts to water quality occur from these sources. The other 303(d)-listed reaches are Dry Intermittent. These reaches are dry for most of the year, have no outlets during the brief period when they do flow, and pose no water quality issues.

Figure 4.8: 303 (D) listed streams within the evaluation area.

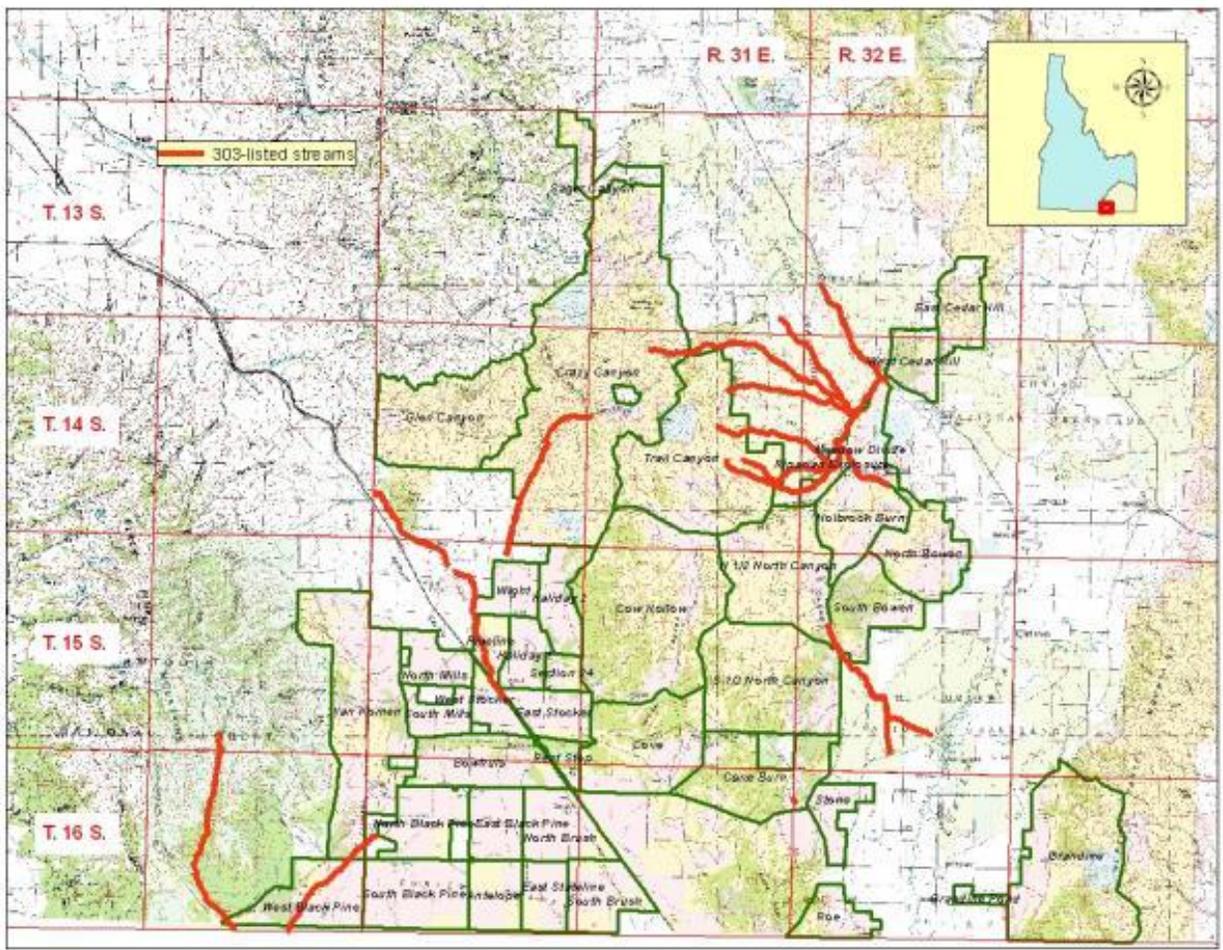


Table 4.6: Evaluation Status for Pastures within the evaluation area for Standard 7.

| Stream/Spring Name | Stream Reach/Type | Evaluation Status |
|---|-------------------|-------------------|
| Josephson Spring (Holbrook Burn Pasture) | Dry Intermittent | Not Meeting |
| Meadow Brook Creek | Perennial | Not Meeting |
| North Canyon Creek | Perennial | Not Meeting |
| Hay Canyon Creek | Dry Intermittent | Not Meeting |
| Unnamed Creek (Pipeline Pasture) | Dry Intermittent | Not Meeting |
| Unnamed Creek (Meadow Brook Divide Pasture) | Dry Intermittent | Not Meeting |
| Unnamed Creek 1 (Trail Canyon Pasture) | Dry Intermittent | Not Meeting |
| Unnamed Creek 2 (Trail Canyon Pasture) | Dry Intermittent | Not Meeting |
| Unnamed Creek 3 (Trail Canyon Pasture) | Dry Intermittent | Not Meeting |
| Unnamed Creek (Crazy Canyon Pasture) | Dry Intermittent | Not Meeting |
| Abandoned Ditch (West Black Pine Pasture) | Dry Intermittent | Not Meeting |

Both streams are listed as impaired water bodies due to sedimentation, siltation and/or fecal coliform bacteria by IDEQ. The IDEQ monitoring sites are located on Forest Service and private lands, which are not fenced from livestock, downstream from BLM administered public lands. On BLM public land there is no evidence that current livestock grazing is a contributing factor to siltation or sediment loading or the source of fecal coliform bacteria into these creeks since both streams are fenced off from livestock grazing.

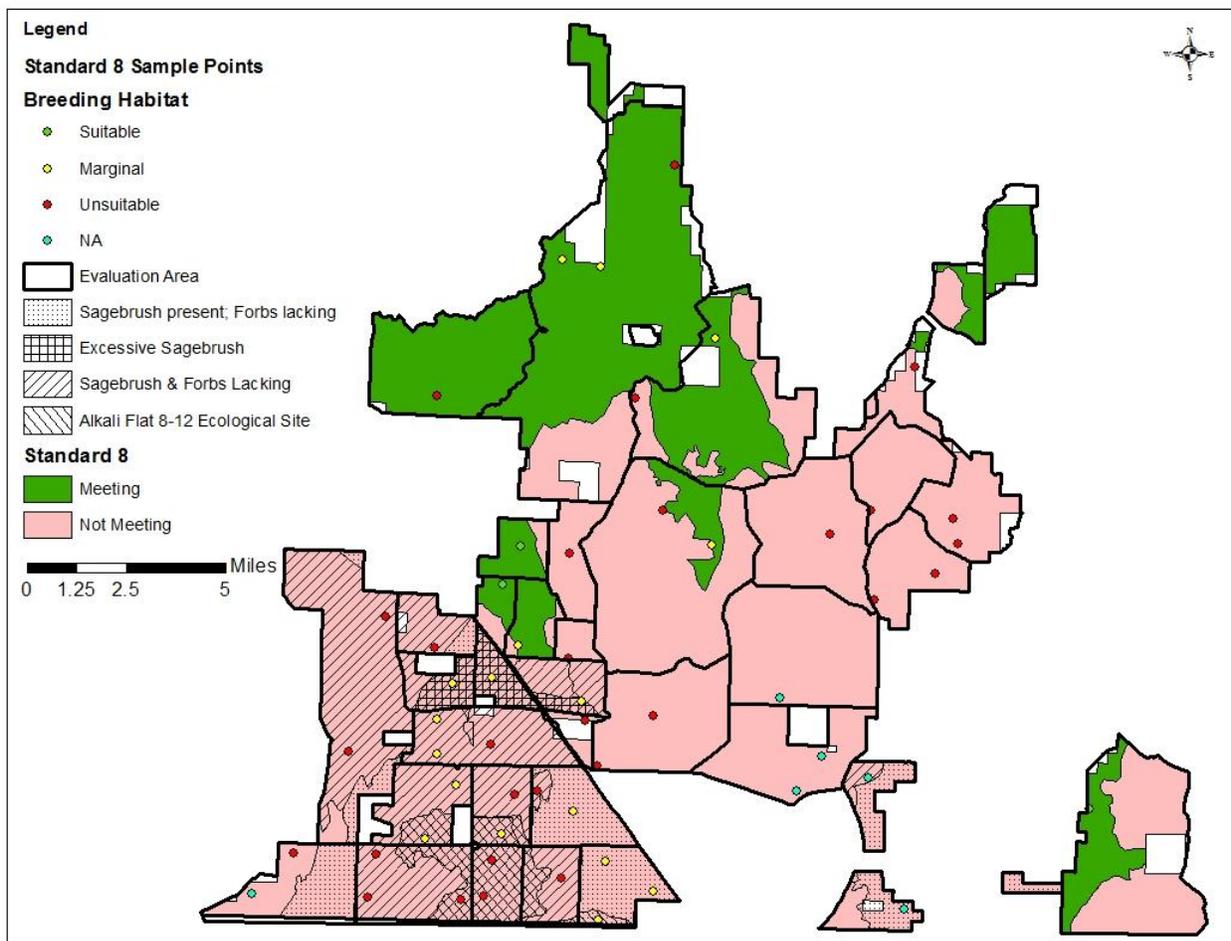
H. Standard 8- Threatened and Endangered Plants and Animals

“Habitats are suitable to maintain viable populations of threatened and endangered, sensitive, and other special status species.” (USDI 1997)

Of the approximately 134,241 acres within the evaluation area, approximately 27% (36,280 acres) are meeting Standard 8 (Threatened and Endangered Plants and Animals). The remaining 73% (97,971 acres) are not meeting Standard 8 (Table 4.7). The map below (Figure 4.9) shows those areas that are not meeting Standard 8 in red. The findings from the 2000, 2011, 2012, and 2013 Sage grouse habitat assessments can be found in Appendix E, Sage Grouse Habitat Studies.

All of the sensitive species are included in this standard. Sage grouse habitat data (HAF) was used to evaluate habitat for all sensitive species in the evaluation area. This method was chosen because sagebrush habitat, which is used by all the sensitive species in the evaluation area, could be evaluated. The assignment of meeting or not meeting this standard was generally based on the habitat requirements of the Greater sage grouse.

Figure 4.9: Evaluation results for the evaluation area for Standard 8



*Areas in red with no additional symbolism are not meeting due to a lack of sagebrush.

Table 4.7: Evaluation Status for Pastures within the Curlew Allotment for Standard 8.

| Pasture | Total Acres | % Meeting Standard | % Not Meeting Standard | Not Meeting Rational* |
|-------------------------|-------------|--------------------|------------------------|-----------------------|
| Antelope | 1,561 | | 100% | A, B, C |
| Bowhuis | 3,358 | | 100% | A, C |
| Cove | 5,201 | | 100% | A |
| Cove Burn | 4,340 | | 100% | A |
| Cow Hollow | 11,226 | 13% | 87% | A |
| Crazy Canyon | 17,879 | 83% | 17% | A |
| East Black Pine | 1,923 | | 100% | A, C |
| East State Line | 1,803 | | 100% | A |
| East Stocker | 1,755 | | 100% | C, D |
| Grandine | 7,627 | 31% | 69% | A |
| Grandine Pond | 323 | | 100% | C |
| Haliday 1 | 1,407 | 81% | 19% | A |
| Haliday 2 | 1,979 | | 100% | A |
| Holbrook Burn | 2,961 | | 100% | A |
| Meadow Divide | 1,532 | 8% | 92% | A |
| North Black Pine | 2,471 | | 100% | A, B, C |
| North Bowen | 2,934 | | 100% | A |
| North Brush | 2,556 | | 100% | A, B, C |
| North Canyon North Half | 5,631 | | 100% | A |
| North Canyon South Half | 6,917 | | 100% | A |
| North Mills | 1,497 | | 100% | A, C |
| Pipeline | 920 | 65% | 35% | A |
| Rest Stop | 354 | | 100% | A |
| Roe | 1,388 | | 100% | A, C |
| Section 24 | 665 | | 100% | A |
| South Black Pine | 3,534 | | 100% | A, C |
| South Bowen | 2,853 | | 100% | A, B |
| South Brush | 2,329 | | 100% | C |
| South Mills | 1,299 | | 100% | A, B, C, D |
| Stone | 1,325 | | 100% | A, C |
| Trail Canyon | 8,415 | 61% | 39% | A |
| Van Koman | 8,645 | | 100% | A, C |
| West Black Pine | 3,056 | | 100% | A, C |
| West Stocker | 1,068 | | 100% | B, C, D |
| West Cedar Hill | 1,364 | 52% | 48% | A |
| Wight | 1,376 | 81% | 19% | A |

A –lack of sagebrush; B –lack of grass height; C –lack of forbs; D –excessive sagebrush cover

Meeting Rational: Within the native vegetation, located primarily in the northern portion of the evaluation area, sagebrush cover was generally found to be marginal (5-15% cover). The vegetative cover within this area is quite variable; containing areas of adequate sagebrush cover (Appendix F; Cover Studies). In areas that have not burned in the past 15 years, the 2013 HAF studies found that forb richness was suitable for all sites based on the requirements outlined in the 2012 HAF protocol. Perennial grass canopy cover was also found to be suitable at all but one sampling site. Based on observations this area receives the highest sage-grouse use throughout the majority of the year.

Within the seedings, located primarily in the southern portion of the evaluation area, if HAF data, cover data, or ocular estimates based on utilization photos, show that sagebrush cover, grass height and forb richness was suitable, based on the 2012 HAF protocol, the areas was meeting standard 8. If all of the three vegetation attributes (sagebrush cover, grass cover, or forb richness) rated as marginal or suitable, the area was generally found to be meeting standard 8.

Not Meeting Rational: The primary reason an area was not meeting the standard was due to lack of sagebrush cover. In areas with limited or no sagebrush cover, other contributing factors included lack of forbs (typically in crested seedings), and lack of optimal herbaceous height. All or portions of the East and West Stocker, South and North Mills, West Black Pine, North Brush, South Brush, Stone, Roe, and Grandine Pond pastures were not meeting due to reasons other than a lack of sagebrush. In these areas where sagebrush was present, these reasons included a lack of forbs, and or excessive sagebrush cover.

Detailed Discussion:

The 2011, 2012 and 2013 HAF assessments confirmed that sagebrush cover is lacking in many areas. Table 4.7 summarizes the habitat features (sagebrush canopy cover, herbaceous vegetation height and forb abundance) collected during HAF sampling. Lack of sage-brush canopy was the primary reason for most areas being designated as unsuitable sage-grouse habitat. This is a result of wildland fires in 2006 and 2007 which removed the sagebrush and juniper cover from approximately 61,074 acres. These fires affected breeding, winter, and upland summer habitat resulting in unsuitable habitat condition.

Wildland fires did not burn the Alkali Flats 8 – 12 ecological sites Figure 4.9. Several of these sites in the evaluation area are mapped as sage-grouse habitat but provide only limited amounts of habitat. These sites have very little sagebrush. The major shrub present is black greasewood. The herbaceous layer consists of large expanses of cheatgrass or halogeton and the perennial grass cover was as low as 0.5%. Even if the herbaceous layer was composed of native grasses and forbs the lack of sagebrush would limit sage-grouse use of the habitat. The most prevalent native grass present in the area is squirrel tail. During 2014, un-grazed squirrel tail grass did not provide 7 inch tall nesting cover on the Alkali Flats 8 – 12 ecological sites.

Some sagebrush ecological sites are dominated by junipers. These sites were included in sage-grouse habitat (PPH or PGH). Wildland fires in 2006 – 2007 removed juniper trees and will enhance these sites for sage-grouse. After the fires many areas have juniper snags. It will take many years before sagebrush recovers and juniper snags fall over to provide suitable sage-grouse habitat on these sites. There are several places in the evaluation area where junipers stands remain. Sage-grouse use of juniper stands is limited.

Preferred forb availability is limited in many of the crested wheatgrass seedings rendering them unsuitable for sage-grouse breeding habitat (Table 4.7). These seedings had very limited forbs, if any, in the seed mix that was planted. The major forbs that were seeded were alfalfa and yellow sweetclover. Both alfalfa and yellow sweetclover provide food for adult sage-grouse and produce insects for broods, but their benefits are short-lived because both species are short-lived perennial plants and few if any were encountered during sampling.

Lack of herbaceous vegetation height in sage-grouse nesting habitat was the third reason for an unsuitable rating (Table 4.7). This occurred in six of the pastures. The sampling occurred after the initiation of the grazing season and the sites did not have 7 inch tall herbaceous nesting cover after livestock had grazed the area.

Sage-grouse, Brewer's Sparrows, and sage sparrows are sagebrush obligates that favor large – unfragmented sagebrush areas (Knick and Rotenberry 1995). The remainder of the sensitive species use sagebrush habitat during some phase of their life. Large portions of the evaluation area no longer provide the required sagebrush habitat.

Causal Factors for not meeting:

Wildfire Influence: Fires are the primary causal factor for why large areas within the allotment are lacking sagebrush cover.

Juniper encroachment: Juniper encroachment and dominance over time resulted in the loss of habitat in vast areas of native vegetation sites. Fires in 2006/2007 burned the majority of the juniper dominated areas; however the natural re-establishment of sagebrush and native vegetation within these areas is poor. Several areas continue to be dominated by juniper that should be sagebrush sites.

Crested Wheatgrass Seedings: Most of the flats and valley bottoms were seeded with crested wheatgrass. These areas have very low forb density and richness. The seedings generally have low shrub cover. Some of the seeding had shrubs re-establish only to be lost from wildfires. Two seeded areas are not meeting because the shrub cover is above optimum >25% and they lack forbs.

Livestock Management: Grazing contributed to reduced habitat quality by reducing herbaceous vegetative heights below what could be used for successful nesting cover by Sage-grouse in some areas. Vegetative height was not a principle factor for failure to achieve the standard.

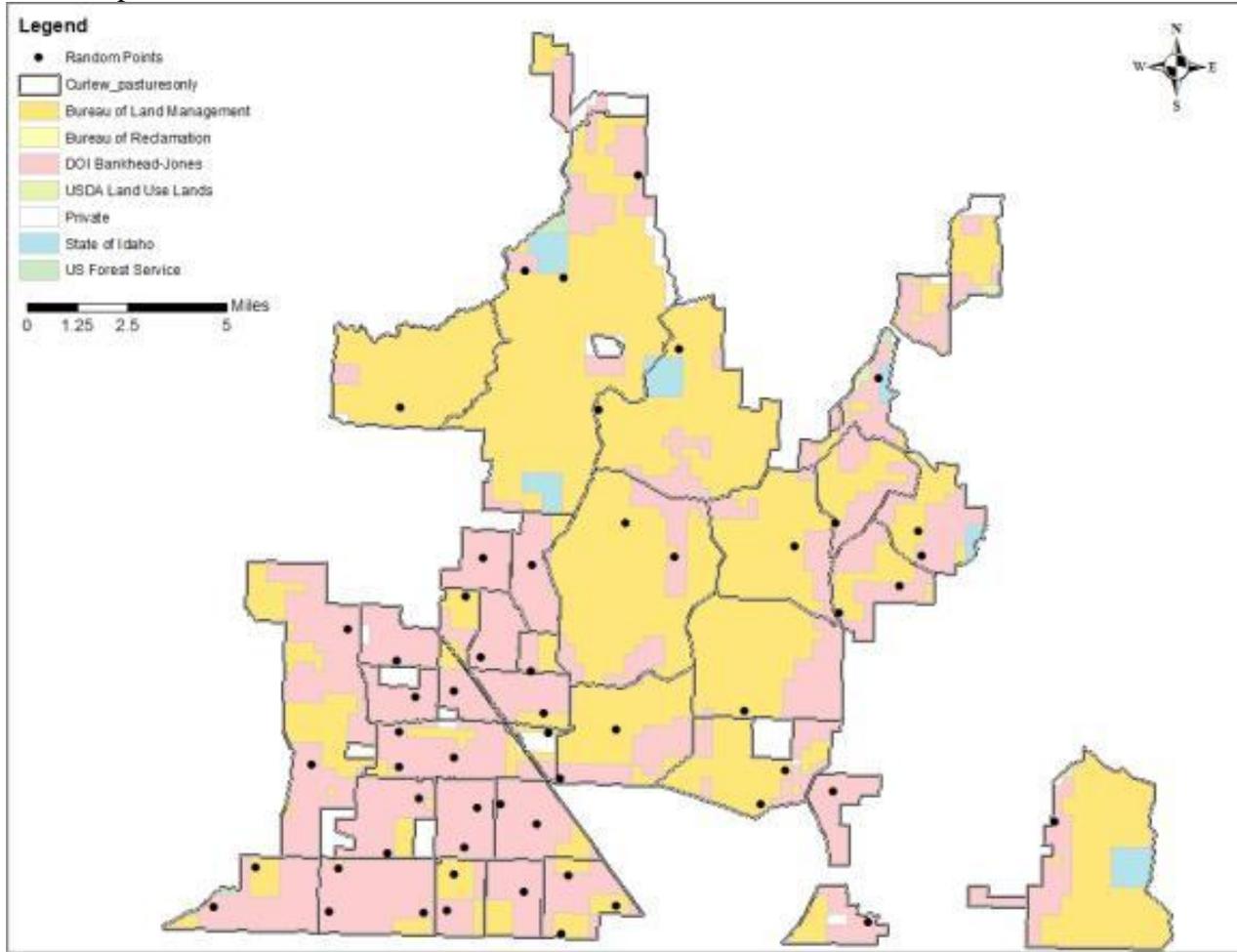
Soil/Ecological Site: Areas that had alkali soils had increased bare ground, reduced sagebrush potential and lower than expected herbaceous vegetation heights. It was noted that ungrazed native grasses (Squirreltail) only achieved a 5 inch height when measured to the top of the seed heads.

V. LIST OF PREPARERS AND SPECIALISTS CONSULTED

| Name | Resource/Activities | Project Role |
|-------------------|--|---|
| Eric Limbach | Range | Interdisciplinary Team, Land Health Assessment Team |
| Mike Kuyper | Range | Interdisciplinary Team |
| Amy Lapp | Cultural | Interdisciplinary Team |
| Charles Patterson | Recreation/Visual Resources/Off-highway vehicles | Interdisciplinary Team |
| James Kumm | Wildlife/Riparian/Wetlands | Interdisciplinary Team, Land Health Assessment Team |
| Mike Jorgensen | Range | Interdisciplinary Team, Land Health Assessment Team |
| Karen Kraus | Vegetation and Special Status T&E/Sensitive | Interdisciplinary Team, Land Health Assessment Team |
| Neil Norman | Noxious Weeds | Interdisciplinary Team, Land Health Assessment Team |
| Brandy Janzen | Soils/Watershed | Land Health Assessment Team |
| Shelli Mavor | Noxious Weeds | Interdisciplinary Team |
| Danny Miller | Lands and Reality | Interdisciplinary Team |

APPENDIX A: INDICATORS OF RANGELAND HEALTH

Figure A-1: Map of Random Points used for the 2013 Land Health Assessment.



During the summer of 2013, 55 sites were visited throughout the evaluation area. Seventeen indicators of rangeland health were evaluated following the procedures outlined in Technical Reference 1734-6 (Interpreting Indicators of Rangeland Health Version 4, 2005). The table A-1 below outlines what the 17 indicators were and which attribute they are associated with. Data was collected on biological crust that is identified as I-18 in Table A-1.

Table A-1: 18 Indicators and associated attributes.

| Indicator | Attribute |
|--|------------------------------------|
| 1. Rills | Soil Stability, Hydrologic |
| 2. Water Flow Patterns | Soil Stability, Hydrologic |
| 3. Pedestals & Terracettes | Soil Stability, Hydrologic |
| 4. Bare Ground= ____% | Soil Stability, Hydrologic |
| 5. Gullies | Soil Stability, Hydrologic |
| 6. Wind-scours, Blowouts, and Depositional Areas | Soil Stability |
| 7. Litter Movement | Soil Stability |
| 8. Soil Surface Resistance to Erosion | Soil Stability, Hydrologic, Biotic |
| 9. Soil Surface Loss/ Degradation | Soil Stability, Hydrologic, Biotic |
| 10. Plant Community Composition | Hydrologic |
| 11. Compaction Layer | Soil Stability, Hydrologic, Biotic |
| 12. Functional/Structural Groups | Biotic |
| 13. Plant Mortality/ Decadence | Biotic |
| 14. Litter Amount | Hydrologic, Biotic |
| 15. Annual Production | Biotic |
| 16. Invasive Plants | Biotic |
| 17. Perennial Plant Reproduction | Biotic |
| 18. Crust | |

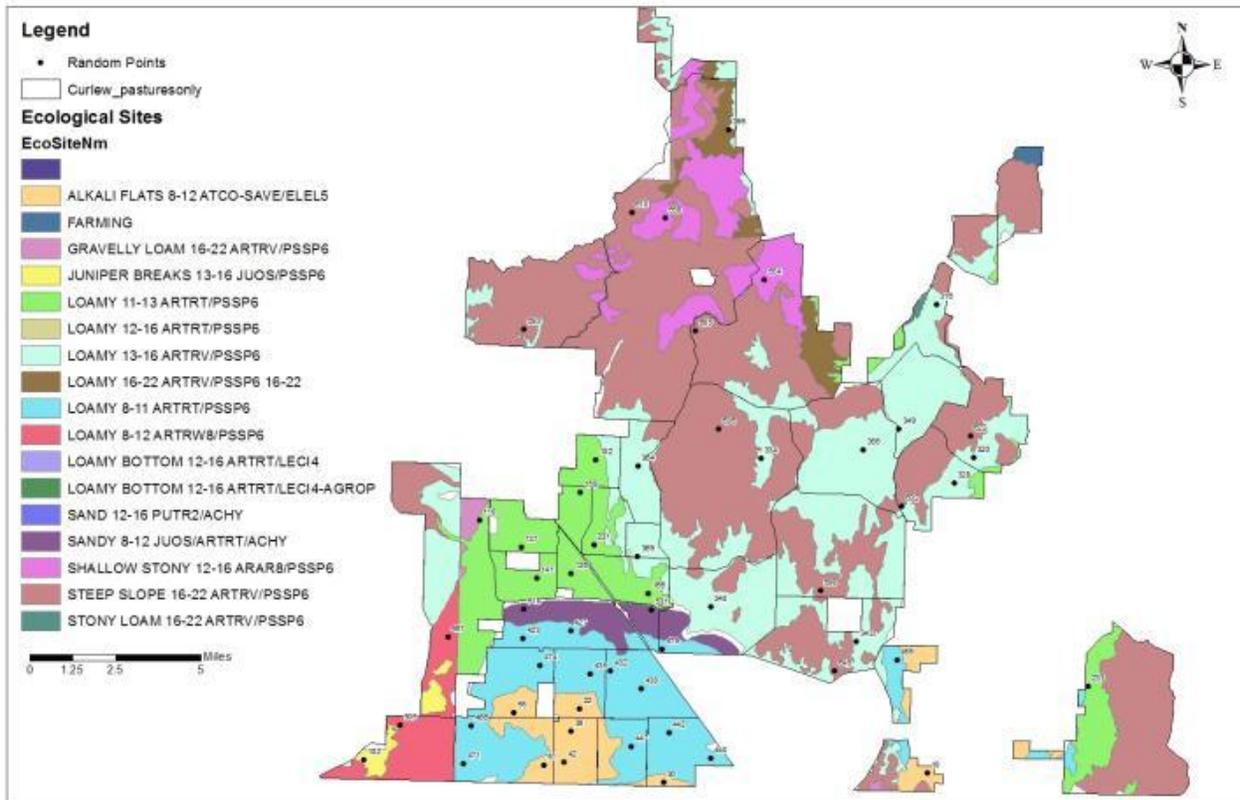
Random sites were created using the random point generator in ArcGIS. Six sites were generated within each ecological site description within each pasture in order to generate a reasonable distribution of points. The ID team then determined which points to visit based off percentage of each ecological site description within each pasture and known anthropologic features such as roads, troughs, and fence lines. Table A-2 below summarizes the pasture, site ID (plot #), and ecological site descriptions that were visited during the 2013 field season.

Table A-2: Summary of ESD's, Site ID, and Pasture.

| Pasture Name | Site ID | Ecological Site Description (ESD) |
|--------------------|---------|-----------------------------------|
| Antelope | 038 | ALKALI FLATS 8-12 ATCO-SAVE/ELEL5 |
| Antelope | 042 | ALKALI FLATS 8-12 ATCO-SAVE/ELEL5 |
| Bowhuis | 423 | LOAMY 8-11 ARTRT/PSSP6 |
| Bowhuis | 427 | LOAMY 8-11 ARTRT/PSSP6 |
| Bowhuis | 518 | SANDY 8-12 JUOS/ARTRT/ACHY |
| Cove | 340 | LOAMY 13-16 ARTRV/PSSP6 |
| Cove | 479 | LOAMY 8-11 ARTRT/PSSP6 |
| Cove Burn | 343 | LOAMY 13-16 ARTRV/PSSP6 |
| Cove Burn | 649 | STEEP SLOPE 16-22 ARTRV/PSSP6 |
| Cow Hollow | 334 | LOAMY 13-16 ARTRV/PSSP6 |
| Cow Hollow | 636 | STEEP SLOPE 16-22 ARTRV/PSSP6 |
| Crazy Canyon | 395 | LOAMY 16-22 ARTRV/PSSP6 16-22 |
| Crazy Canyon | 558 | SHALLOW STONY 12-16 ARAR8/PSSP6 |
| Crazy Canyon | 610 | STEEP SLOPE 16-22 ARTRV/PSSP6 |
| East Black Pine | 022 | ALKALI FLATS 8-12 ATCO-SAVE/ELEL5 |
| East Black Pine | 435 | LOAMY 8-11 ARTRT/PSSP6 |
| East Cedar Hills | ** | ** |
| East Stateline | 447 | LOAMY 8-11 ARTRT/PSSP6 |
| East Stocker | 166 | LOAMY 11-13 ARTRT/PSSP6 |
| Glen Canyon | 593 | STEEP SLOPE 16-22 ARTRV/PSSP6 |
| Grandine | 233 | LOAMY 11-13 ARTRT/PSSP6 |
| Grandine Pond | ** | ** |
| Haliday-1 | 231 | LOAMY 11-13 ARTRT/PSSP6 |
| Haliday-2 | 364 | LOAMY 13-16 ARTRV/PSSP6 |
| Holbrook Burn | 349 | LOAMY 13-16 ARTRV/PSSP6 |
| Meadowbrook Divide | 316 | LOAMY 13-16 ARTRV/PSSP6 |
| North Black Pine | 055 | ALKALI FLATS 8-12 ATCO-SAVE/ELEL5 |
| North Black Pine | 474 | LOAMY 8-11 ARTRT/PSSP6 |

| Pasture Name | Site ID | Ecological Site Description (ESD) |
|-------------------|---------|-----------------------------------|
| North Bowen | 320 | LOAMY 13-16 ARTRV/PSSP6 |
| North Bowen | 622 | STEEP SLOPE 16-22 ARTRV/PSSP6 |
| North Brush | 430 | LOAMY 8-11 ARTRT/PSSP6 |
| North Brush | 432 | LOAMY 8-11 ARTRT/PSSP6 |
| North Canyon N1/2 | 356 | LOAMY 13-16 ARTRV/PSSP6 |
| North Canyon S1/2 | 598 | STEEP SLOPE 16-22 ARTRV/PSSP6 |
| North Mills | 137 | LOAMY 11-13 ARTRT/PSSP6 |
| Pipeline | 159 | LOAMY 11-13 ARTRT/PSSP6 |
| Rest Stop | 531 | SANDY 8-12 JUOS/ARTRT/ACHY |
| Roe | 010 | ALKALI FLATS 8-12 ATCO-SAVE/ELEL5 |
| Section 24 | 369 | LOAMY 13-16 ARTRV/PSSP6 |
| South Black Pine | 051 | ALKALI FLATS 8-12 ATCO-SAVE/ELEL5 |
| South Black Pine | 466 | LOAMY 8-11 ARTRT/PSSP6 |
| South Black Pine | 471 | LOAMY 8-11 ARTRT/PSSP6 |
| South Bowen | 328 | LOAMY 13-16 ARTRV/PSSP6 |
| South Bowen | 632 | STEEP SLOPE 16-22 ARTRV/PSSP6 |
| South Brush | 030 | ALKALI FLATS 8-12 ATCO-SAVE/ELEL5 |
| South Brush | 440 | LOAMY 8-11 ARTRT/PSSP6 |
| South Brush | 442 | LOAMY 8-11 ARTRT/PSSP6 |
| South Mills | 141 | LOAMY 11-13 ARTRT/PSSP6 |
| Stone | 459 | LOAMY 8-11 ARTRT/PSSP6 |
| Trail Canyon | 554 | SHALLOW STONY 12-16 ARAR8/PSSP6 |
| Trail Canyon | 605 | STEEP SLOPE 16-22 ARTRV/PSSP6 |
| Van Koman | 118 | LOAMY 11-13 ARTRT/PSSP6 |
| Van Koman | 497 | LOAMY 8-12 ARTRW8/PSSP6 |
| West Black Pine | 102 | JUNIPER BREAKS 13-16 JUOS/PSSP6 |
| West Black Pine | 505 | LOAMY 8-12 ARTRW8/PSSP6 |
| West Cedar Hills | ** | ** |
| West Stocker | 126 | LOAMY 11-13 ARTRT/PSSP6 |
| Wight | 182 | LOAMY 11-13 ARTRT/PSSP6 |

Figure A-2: Ecological Site Description and Location of Cover Plots conducted in 2013



The culmination of the information collected is summarized below in Table A-3. Photos from the Land Health Assessment are located in Appendix E: Sage Grouse Habitat Studies; 2013 Sage Grouse Habitat Assessment Photos.

Summary of Land Health Assessment data collected in the evaluation area. Table 1 is a summary of the Evaluation Summary Worksheet Data that was collected at each site assessed. The abbreviation under the individual indicators and criteria corresponds to the departure from ecological site description/reference area (1= none to slight, 2= slight to moderate, 3= moderate, 4= moderate to extreme, and 5= extreme to total departure).

Table A-3: LHA Data.

| Site ID | Pasture Name | Indicators of Land Health | | | | | | | | | | | | | | | | | | Land Health Attributes | | |
|---------|------------------|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------------------------|--------|------------|
| | | I-1 | I-2 | I-3 | I-4 | I-5 | I-6 | I-7 | I-8 | I-9 | I-10 | I-11 | I-12 | I-13 | I-14 | I-15 | I-16 | I-17 | I-18 | Soil Stability | Biotic | Hydrologic |
| 038 | Antelope | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 2 | 2 | 4 | 3 | 3 | 2 | 1 | 3 | 1 |
| 042 | Antelope | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 2 | 3 | 2 | 3 | 4 | 4 | 4 | 2 | 1 | 4 | 2 |
| 423 | Bowhuis | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 1 | 3 | 2 | 1 | 2 | 4 | 1 | 2 | 1 |
| 427 | Bowhuis | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 4 | 2 | 4 | 2 | 1 | 2 | ** | 1 | 2 | 2 |
| 518 | Bowhuis | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | ** | 1 | 1 | 1 |
| 340 | Cove | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 3 | 1 | 3 | 2 | 3 | 2 | 3 | 1 | 3 | 2 |
| 479 | Cove | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 3 | 3 | 3 | 4 | 2 | 4 | 1 | 3 | 1 |
| 343 | Cove Burn | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 2 | 4 | 1 | 3 | 3 | 4 | 3 | 5 | 1 | 3 | 2 |
| 649 | Cove Burn | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 4 | 1 | 3 | 3 | 4 | 3 | 2 | 1 | 3 | 2 |
| 334 | Cow Hollow | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 4 | 2 | 1 | 2 | ** | 1 | 1 | 1 |
| 636 | Cow Hollow | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 4 | 2 | ** | 1 | 2 | 1 |
| 395 | Crazy Canyon | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 2 | 4 | 1 | ** | 1 | 2 | 1 |
| 558 | Crazy Canyon | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | ** | 1 | 1 | 1 |
| 610 | Crazy Canyon | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 4 | 1 | ** | 1 | 2 | 1 |
| 022 | East Black Pine | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 1 | 4 | 1 | 3 | 5 | 4 | 3 | ** | 1 | 4 | 2 |
| 435 | East Black Pine | 1 | 1 | 3 | 1 | 3 | 1 | 1 | 1 | 1 | 3 | 1 | 3 | 2 | 3 | 2 | 2 | 2 | 4 | 2 | 2 | 2 |
| ** | East Cedar Hills | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| 447 | East Stateline | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 4 | 1 | 4 | 2 | 1 | 3 | ** | 1 | 2 | 2 |
| 166 | East Stocker | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | ** | 1 | 2 | 1 |
| 593 | Glen Canyon | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 4 | 1 | ** | 1 | 2 | 1 |
| 233 | Grandine | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | ** | 1 | 1 | 1 |
| ** | Grandine Pond | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |

| Indicators of Land Health | | | | | | | | | | | | | | | | | | | | Land Health Attributes | | |
|---------------------------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------------------------|--------|------------|
| Site ID | Pasture Name | I-1 | I-2 | I-3 | I-4 | I-5 | I-6 | I-7 | I-8 | I-9 | I-10 | I-11 | I-12 | I-13 | I-14 | I-15 | I-16 | I-17 | I-18 | Soil Stability | Biotic | Hydrologic |
| 231 | Haliday-1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 2 | 1 | 1 | ** | 1 | 1 | 1 |
| 364 | Haliday-2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 3 | 1 | 2 | 1 | 3 | 2 | 2 | 2 | 5 | 1 | 2 | 1 |
| 349 | Holbrook Burn | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 1 | 2 | 2 | 1 | 3 | 3 | 1 | 2 | 1 |
| 316 | Meadowbrook Divide | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 3 | 1 | 1 | 1 | 3 | 1 | 1 | 1 |
| 055 | North Black Pine | 1 | 1 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 4 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |
| 474 | North Black Pine | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 4 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | 1 |
| 320 | North Bowen | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 1 | 3 | 1 | 3 | 2 | 1 | 3 | ** | 1 | 2 | 1 |
| 622 | North Bowen | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 3 | 1 | ** | 1 | 2 | 1 |
| 430 | North Brush | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 1 | 3 | 3 | 4 | 3 | 4 | 1 | 3 | 1 |
| 432 | North Brush | 1 | 1 | 4 | 4 | 1 | 3 | 1 | 1 | 1 | 4 | 1 | 3 | 3 | 1 | 3 | 3 | 4 | 4 | 3 | 3 | 3 |
| 356 | North Canyon N1/2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 3 | 1 | 3 | 1 | 2 | 1 | 3 | 2 | 3 | 2 | 3 | 1 | 2 | 1 |
| 598 | North Canyon S1/2 | 1 | 3 | 3 | 4 | 3 | 1 | 2 | 1 | 1 | 3 | 1 | 3 | 1 | 1 | 4 | 2 | 4 | ** | 3 | 3 | 3 |
| 137 | North Mills | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 4 | 1 | 3 | 2 | 1 | 3 | ** | 1 | 2 | 2 |
| 159 | Pipeline | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 1 |
| 531 | Rest Stop | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 3 | 1 | 2 | 2 | 2 | 3 | 1 | 1 | 2 | 1 |
| 010 | Roe | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 1 | 2 | 2 | 2 | 3 | 1 | 2 | 2 |
| 369 | Section 24 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 1 | 3 | 2 | 1 | 3 | 3 | 1 | 2 | 1 |
| 051 | South Black Pine | 1 | 1 | 2 | 3 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 4 | 3 | 2 | 3 | 3 | 3 | 4 | 2 | 3 | 2 |
| 466 | South Black Pine | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 4 | 2 | 2 | 4 | 2 | 4 | ** | 2 | 3 | 2 |
| 471 | South Black Pine | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 3 | 1 | 4 | 2 | 2 | 2 | 2 | 3 | 3 | 1 | 2 | 2 |
| 328 | South Bowen | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 3 | 1 | 3 | 2 | 2 | 1 | 3 | 2 | 3 | 1 | ** | 1 | 2 | 2 |
| 632 | South Bowen | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 3 | 1 | 2 | 2 | 2 | 2 | 3 | 1 | 2 | 1 |
| 030 | South Brush | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 1 | 3 | 2 | 3 | 3 | 4 | 3 | 4 | 1 | 3 | 2 |

| Indicators of Land Health | | | | | | | | | | | | | | | | | | | | Land Health Attributes | | | |
|---------------------------|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------------------------|--------|------------|----|
| Site ID | Pasture Name | I-1 | I-2 | I-3 | I-4 | I-5 | I-6 | I-7 | I-8 | I-9 | I-10 | I-11 | I-12 | I-13 | I-14 | I-15 | I-16 | I-17 | I-18 | Soil Stability | Biotic | Hydrologic | |
| 440 | South Brush | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 4 | 2 | 3 | 3 | 4 | 3 | 4 | 1 | 3 | 2 | |
| 442 | South Brush | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 3 | 2 | 3 | 3 | 4 | 2 | 4 | 3 | 4 | 2 | 3 | 2 | |
| 141 | South Mills | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 3 | 1 | 3 | 3 | 2 | 2 | 1 | 1 | 3 | 1 | |
| 459 | Stone | 1 | 1 | 3 | 1 | 2 | 1 | 1 | 3 | 1 | 4 | 1 | 4 | 1 | 4 | 1 | 1 | 2 | ** | 2 | 2 | 3 | |
| 554 | Trail Canyon | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | ** | 1 | 1 | 1 | |
| 605 | Trail Canyon | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 2 | 1 | 3 | 1 | 1 | 1 | |
| 118 | Van Koman | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 4 | 1 | 4 | 2 | 3 | 3 | 5 | 1 | 2 | 2 | |
| 497 | Van Koman | 1 | 1 | 3 | 1 | 3 | 1 | 1 | 4 | 1 | 3 | 1 | 2 | 1 | 3 | 2 | 1 | 1 | 5 | 2 | 2 | 2 | |
| 102 | West Black Pine | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 2 | 4 | 2 | ** | 1 | 2 | 1 | |
| 505 | West Black Pine | 1 | 2 | 3 | 1 | 3 | 1 | 2 | 1 | 1 | 3 | 1 | 3 | 3 | 2 | 2 | 2 | 2 | ** | 2 | 2 | 3 | |
| ** | West Cedar Hills | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| 126 | West Stocker | 1 | 1 | 3 | 2 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 4 | 2 | 4 | 3 | 1 | 3 | 4 | 2 | 3 | 2 | |
| 182 | Wight | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 1 | 2 | 4 | 1 | 2 | 1 | |

** depicts sites where data is not available.

APPENDIX B: CLIMATE DATA

Climate Data

Mean Monthly Totals

(Temperature, °F - Precipitation, inches - *m* = missing data)

MALAD CITY, IDAHO (105559)

Period of Record: 8/1/1948 to 1/28/2012

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|-----------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|--------|
| Average Max. Temperature (F) | 32.6 | 38.6 | 48.8 | 59.7 | 69.9 | 79.8 | 89.6 | 88.3 | 78.2 | 64.7 | 46.5 | 34.7 | 60.9 |
| Average Min. Temperature (F) | 11.1 | 15.0 | 23.2 | 30.1 | 37.6 | 43.7 | 49.3 | 48.1 | 39.3 | 29.6 | 21.9 | 13.6 | 30.2 |
| Average Total Precipitation (in.) | 1.17 | 1.01 | 1.03 | 1.15 | 1.79 | 1.21 | 0.91 | 0.85 | 0.94 | 1.02 | 1.02 | 1.07 | 13.2 |
| Average Total Snow Fall (in.) | 10.7 | 6.8 | 3.9 | 1.4 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 3.7 | 9.4 | 36.5 |

MALAD CITY: ANNUAL PRECIPITATION (inches)

| YEAR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | ANNUAL |
|------|-----------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------------------|
| 1999 | 1.27 | 1.44 | 0.41 | 1.66 | 3.17 | 2.5 | 0 | 2.29 | 0.09 | 0.12 | 0.34 | 0.43 | 12.3 |
| 2000 | 0.5 | 2.75 | 0.34 | 0.81 | 0.68 | 0.1 | 0.3 | 0.35 | 1.1 | 3.13 | 0.03 | 0.23 | 10.3 |
| 2001 | 0 | 0.51 | 0.66 | 1.45 | 0 | 0.23 | 0.49 | 0.18 | 0.2 | 0.25 | 0 | 2.36 | 3.7 |
| 2002 | 0.57 | 0.13 | 0.31 | 1.28 | 1.15 | 0.6 | 0.61 | 0 | 1.28 | 0.47 | 0.51 | 0.67 | 7.6 |
| 2003 | 0.36 | 1.01 | 0.58 | 0.63 | 1.54 | 0.61 | 0.76 | 0.94 | 0.43 | 0.37 | 0.9 | 2.67 | 8.1 |
| 2004 | 0.51 | 1.67 | 0.5 | 1.08 | 2.51 | 0 | 1.01 | 1.65 | 0.31 | 4.09 | 0.55 | 1.27 | 15.2 |
| 2005 | 1.79 | 0.67 | 1.23 | 3.2 | 2.99 | 1.9 | 0.69 | 1.54 | 1.71 | 0 | 0 | 0 | 15.7 |
| 2006 | <i>m</i> ¹ | <i>m</i> ¹ |
| 2007 | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> ¹ |
| 2008 | 0 | 0 | 0.04 | 0.52 | 1.27 | 0.23 | 0.25 | 0.1 | 0.6 | 0.38 | 0.92 | 0 | <i>m</i> ¹ |
| 2009 | 0.67 | 2.5 | 0.15 | 1.77 | 2.01 | 2.78 | 0.01 | 0.63 | 0.95 | 1.03 | 0 | 1.33 | 13.8 |
| 2010 | 2.56 | 0.74 | 0 | 1.46 | 0.78 | 1.46 | 0 | 0.5 | 0.16 | 2.1 | 1.93 | 2.53 | 14.2 |

*m*¹ = missing data

WATER-YEAR AVERAGE (October - May), Malad City = 8.5 inches

| YEAR(S) | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | Water-Year |
|---------|----------|----------|----------|-----------------------|----------|----------|----------|----------|------------|
| 1999 | 0.6 | 0.3 | 0.7 | 1.3 | 1.4 | 0.4 | 1.7 | 3.2 | 9.6 |
| 2000 | 0.1 | 0.3 | 0.4 | 0.5 | 2.8 | 0.3 | 0.8 | 0.7 | 5.9 |
| 2001 | 3.1 | 0.0 | 0.2 | <i>m</i> ¹ | 0.5 | 0.7 | 1.5 | <i>m</i> | 6.0 |
| 2002 | 0.3 | <i>m</i> | 2.4 | 0.6 | 0.1 | 0.3 | 1.3 | 1.2 | 6.2 |
| 2003 | 0.5 | 0.5 | 0.7 | 0.4 | 1.0 | 0.6 | 0.6 | 1.5 | 5.8 |
| 2004 | 0.4 | 0.9 | 2.7 | 0.5 | 1.7 | 0.5 | 1.1 | 2.5 | 10.3 |
| 2005 | 4.1 | 0.6 | 1.3 | 1.8 | 0.7 | 1.2 | 3.2 | 3.0 | 15.9 |
| 2006 | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> |
| 2007 | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> |
| 2008 | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | 0.0 | 0.5 | 1.3 | <i>m</i> |
| 2009 | 0.4 | 0.9 | <i>m</i> | 0.7 | 2.5 | 0.2 | 1.8 | 2.0 | 8.5 |
| 2010 | 1.0 | 0.0 | 1.3 | 2.6 | 0.7 | 0.2 | 1.5 | 0.8 | 8.1 |

*m*¹ = missing data

MALTA AVIATION, IDAHO

Period of Record: 11/1/1984 to 1/31/2010

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------------|
| Average Max. Temperature (F) | 38.4 | 44.3 | 53.5 | 62.1 | 70.3 | 80.6 | 89.4 | 88.1 | 77.9 | 64.9 | 48.8 | 38.2 | 63.0 |
| Average Min. Temperature (F) | 18.7 | 21.6 | 26.9 | 32.5 | 39.4 | 45.5 | 50.6 | 49.7 | 42 | 33.8 | 25.6 | 18.9 | 33.8 |
| Average Total Precipitation (in.) | 0.66 | 0.49 | 0.67 | 0.99 | 1.39 | 0.95 | 0.64 | 0.69 | 0.68 | 0.65 | 0.6 | 0.51 | 8.9 |
| Average Total Snow Fall (in.) | 4 | 2 | 0.9 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 12.9 |

Malta Aviation: ANNUAL PRECIPITATION (inches)

| YEAR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | ANN |
|------|----------|----------|----------|----------|----------|----------|----------|----------|-----------------------|----------|----------|----------|----------|
| 1999 | 1 | 0.52 | 0.24 | 2.26 | 1.97 | 0 | 0.03 | 1.01 | 0.07 | 0.63 | 0.21 | 0.11 | 8.1 |
| 2000 | 0.97 | 0.88 | 0.13 | 0.59 | 0.72 | 0.11 | 1.08 | 0.1 | 0.39 | 1.75 | 0.27 | 0.37 | 7.4 |
| 2001 | 0.32 | 0.07 | 0.32 | 0.62 | 0 | 0.29 | 0.74 | 0.53 | 0.8 | 0.45 | 0.8 | 0.88 | 4.1 |
| 2002 | 0.64 | 0.08 | 0.19 | 1.12 | 0.3 | 0.82 | 0.82 | 0.27 | 1.24 | 0.66 | 0.23 | 0.19 | 6.6 |
| 2003 | 0.07 | 0.13 | 0.63 | 1.27 | 0.87 | 0.25 | 0.44 | 1.84 | 0.5 | 0.03 | 1.12 | 0.85 | 8.0 |
| 2004 | 0.11 | 0.97 | 0.29 | 0.88 | 1.05 | 0.56 | 1.23 | 1.25 | 0.92 | 1.17 | 0.26 | 0.93 | 8.1 |
| 2005 | 1.36 | 0.25 | 0.35 | 2.72 | 3.51 | 1.34 | 0.06 | 0.66 | 0.34 | 1.4 | 0.83 | 1.24 | 12.8 |
| 2006 | 1.28 | 0.36 | 1.41 | 1.65 | 0.72 | 0.55 | 0.57 | 0.21 | <i>m</i> ¹ | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> |
| 2007 | <i>m</i> | <i>m</i> | <i>m</i> | 0.97 | 0.28 | 0.66 | 0.2 | 1.12 | 0.9 | 0.83 | 0.27 | 0.48 | 5.4 |
| 2008 | 0.35 | 0.27 | 0.47 | 0.06 | 0.88 | 0.35 | 0 | 0.13 | 0.21 | 1.29 | 0.78 | 0.16 | 4.8 |
| 2009 | 0.73 | 0.69 | 1.13 | 0.82 | 1.17 | 3.88 | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | 0.04 | 0.33 | 5.8 |
| 2010 | 0.35 | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> |

*m*¹ = missing data

WATER-YEAR AVERAGE (October - May), Malta Aviation = 5.9 inches

| YEAR | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | Water-Year |
|------|-----------------------|----------|----------|----------|----------|----------|----------|----------|------------|
| 1999 | 0.2 | 0.3 | 0.4 | 1.0 | 0.5 | 0.24 | 2.3 | 2.0 | 6.9 |
| 2000 | 0.6 | 0.2 | 0.1 | 1.0 | 0.9 | 0.13 | 0.6 | 0.7 | 4.2 |
| 2001 | 1.8 | 0.3 | 0.34 | 0.3 | 0.1 | 0.32 | 0.6 | 0 | 3.8 |
| 2002 | 0.4 | 0.8 | 0.9 | 0.6 | 0.1 | 0.19 | 1.1 | 0.3 | 4.4 |
| 2003 | 0.7 | 0.2 | 0.2 | 0.1 | 0.1 | 0.63 | 1.3 | 0.9 | 4.1 |
| 2004 | 0.0 | 1.1 | 0.9 | 0.1 | 1.0 | 0.29 | 0.9 | 1.1 | 5.4 |
| 2005 | 1.2 | 0.3 | 0.9 | 1.4 | 0.3 | 0.35 | 2.7 | 3.5 | 10.7 |
| 2006 | 1.4 | 0.8 | 1.2 | 1.3 | 0.4 | 1.41 | 1.7 | 0.7 | 8.9 |
| 2007 | <i>m</i> ¹ | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | 1.0 | 0.3 | <i>m</i> |
| 2008 | 0.8 | 0.3 | 0.5 | 0.4 | 0.3 | 0.47 | 0.1 | 0.9 | 3.8 |
| 2009 | 1.3 | 0.8 | 0.2 | 0.7 | 0.7 | 1.13 | 0.8 | 1.2 | 6.8 |
| 2010 | <i>m</i> | 0.0 | 0.3 | 0.4 | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> | <i>m</i> |

*m*¹ = missing data

These data were compiled from Idaho Climate Summaries (<http://www.wrcc.dri.edu/summary/Climsmsid.html>).

APPENDIX C: PFC EVALUATIONS

PFC Evaluations 2011

Pocatello Field Office (Riparian Functional Assessment)

Lotic Checklist

Date: 10/4/2011 Riparian Name: Bench Spring Segment/Reach ID #:
 ID Team Observers: James Kumm, Eric Limbach Type (Spring/River) Spring fed creek
 GPS UTM: _____ Legal: T. S., R. E., Sec Size (Feet/Miles): _____ Measurement Type _____

Potential: Riparian is fed by trough overflow on nearly level ground (<3% slop) Spring buck & pole good condition/no breaks

| Yes | No | N/A | HYDROLOGY/VEGETATION/EROSION-DEPOSITION |
|-----|----|-----|---|
| | | X | 1) Floodplain above bankfull is inundated in "relatively frequent" events. Seasonal flow not natural, overflow only during grazing season. No flooding events. |
| | | X | 2) Where beaver dams are present are they active and stable |
| X | | | 3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region) Broad local soil filled channel. |
| | X | | 4) Riparian-wetland area is widening or has achieved potential extent. Lack riparian veg, non-reliable water source-not spastial except rain/snow feed. |
| X | | | 5) Upland watershed is not contributing to riparian-wetland degradation. Uplands have good vegetative cover, well vegetative spring and productive, +100% cover. |
| | X | | 6) Diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery) Area seeded to crested WG. Some ARTR, CHVI – not to potential. |
| | X | | 7) Diverse composition of riparian-wetland vegetation (for maintenance/recovery) <i>(species present)</i> No riparian SPP present |
| | X | | 8) Species present indicate maintenance of riparian-wetland soil moisture characteristics. very moist most of season. Standing water in hoof prints, upland species present. |
| X | | | 9) Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events <i>(community types present)</i> perennial grass land, very low slope |
| | | X | 10) Riparian-wetland plants exhibit high vigor. No riparian species. Good vigor of crested WG plants, shrub reproduction. |
| X | | | 11) Adequate riparian-wetland vegetative cover present to protect banks and dissipate energy during high flows <i>(enough)</i> Spring and strip of wetland not likely to be subject to heavy precipitation over land flow. |
| | | X | 12) Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery) |
| | | | 13) Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) adequate to dissipate energy. Lacking rocks, course material |
| | | X | 14) Point bars are vegetating with riparian-wetland vegetation |
| X | | | 15) Lateral stream movement is associated with natural sinuosity. Riparian of such limited extent; no affect |
| X | | | 16) System is vertically stable <i>(not downcutting)</i> level, soil filled channel, cow hoof imprints |
| X | | | 17) Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition) |

SUMMARY DETERMINATION

| | |
|---|---------------------|
| REMARKS: Currently developed as a flow-through system. Trough is directly down from spring. No protective fence for overflow water. In event of very heavy runoff from Black Pine Mountain, Bench Spring (?) would probably be a deposition area, and benefit ribbon fence? To new trough area. RECOMMENDATION: Relocate trough, >1/4 mile from spring head, move livestock impacts away. Pipes overflow from trough (there is a slight channel) and build protective fence. Float trough to backup water into spring source. Would need to move trough to NE and fence the potential riparian area | |
| FUNTIONAL RATING: Nonfunctional | TREND: Not Apparent |
| ARE CONTRIBUTING FACTORS OUTSIDE MANAGER CONTROL: No | FACTORS: |



Bench Spring Headbox Cover, 2011



Bench Spring Enclosure



Overflow from Bench Spring trough

**Pocatello Field Office (Riparian Functional Assessment)
Lotic Checklist**

Date: 10/4/2011 Riparian Name: Black Pine Spring Segment/Reach ID #:
 ID Team Observers: James Kumm, Eric Limbach Type (Spring/River) Spring fed creek
 GPS UTM: _____ Legal: T. S., R. E., Sec Size (Feet/Miles): _____ Measurement Type _____

Potential: High concentration of cattle along Black Pine Road

| Yes | No | N/A | HYDROLOGY/VEGETATION/EROSION-DEPOSITION |
|-----|----|-----|---|
| | | X | 1) Floodplain above bankfull is inundated in "relatively frequent" events. Trough overflow feeds system, very short reach to pond (- 50 ft.) |
| | | X | 2) Where beaver dams are present are they active and stable |
| X | | | 3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region) |
| | X | | 4) Riparian-wetland area is widening or has achieved potential extent |
| X | | | 5) Upland watershed is not contributing to riparian-wetland degradation |
| | X | | 6) Diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery) |
| | X | | 7) Diverse composition of riparian-wetland vegetation (for maintenance/recovery) <i>(species present)</i> Nebr. Sedge only apparent riparian species |
| | X | | 8) Species present indicate maintenance of riparian-wetland soil moisture characteristics |
| X | | | 9) Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events <i>(community types present)</i> ARTR, CHVI major woody species – no riparian woody SPP |
| | | X | 10) Riparian-wetland plants exhibit high vigor Veg heavily grazed, trampled |
| | X | | 11) Adequate riparian-wetland vegetative cover present to protect banks and dissipate energy during high flows <i>(enough)</i> High flow unlikely |
| | | X | 12) Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery) |
| | X | | 13) Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) adequate to dissipate energy |
| | | X | 14) Point bars are vegetating with riparian-wetland vegetation |
| | X | | 15) Lateral stream movement is associated with natural sinuosity Essentially no channel |
| X | | | 16) System is vertically stable <i>(not downcutting)</i> |
| X | | | 17) Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition) |

SUMMARY DETERMINATION

| | |
|---|-----------------|
| REMARKS: Developed as a flow-thru system – water is piped to troughs and waters 3 separate pastures with mud-hole overflow, water flows over side of trough and onto ground. | |
| RECOMMENDATION: Rebuild spring enclosure. Float system and fence portion of drainage downstream of spring source. Would have to leave a travel lane on east end drainage for livestock to access trough. OR leave system as flow-thru but pipe excess water away from troughs to develop riparian area. Reroute overflow from trough about 300 ft. east into neutral drainage OR Reroute spring to neutral drainage, with valve to turn trough on/off. FENCE THESE AREAS. | |
| FUNCTIONAL RATING: Nonfunctional | TREND: Downward |
| ARE CONTRIBUTING FACTORS OUTSIDE MANAGER CONTROL: No | FACTORS: |



Black Pine Spring box, 2011



Black Pine Spring Source, 2011

**Pocatello Field Office (Riparian Functional Assessment)
Lotic Checklist**

Date: 10/18/2011 Riparian Name: Holbrook Spring Enclosure Segment/Reach ID #:
 ID Team Observers: James Kumm, Eric Limbach Type (Spring/River) Spring fed creek
 GPS UTM: _____ Legal: T. S., R. E., Sec Size (Feet/Miles): _____ Measurement Type _____

Potential: _____

| Yes | No | N/A | HYDROLOGY/VEGETATION/EROSION-DEPOSITION |
|-----|----|-----|---|
| | | X | 1) Floodplain above bankfull is inundated in "relatively frequent" events. Spring is source overflow from trough into ravine with surface water |
| | | X | 2) Where beaver dams are present are they active and stable |
| X | | | 3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region) Confined to steep, narrow canyon/draw |
| X | | | 4) Riparian-wetland area is widening or has achieved potential extent Confined |
| | X | | 5) Upland watershed is not contributing to riparian-wetland degradation Trough, concentration of cattle has denuded upland area above riparian area |
| X | | | 6) Diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery) Good cover, mix of species. Not many riparian spp. Roses, currants, Nebr. Sedge, rushes, chokecherry |
| X | | | 7) Diverse composition of riparian-wetland vegetation (for maintenance/recovery) (<i>species present</i>) Roses, currants, Nebr. Sedge, rushes, Sporobolus |
| X | | | 8) Species present indicate maintenance of riparian-wetland soil moisture characteristics |
| X | | | 9) Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events (<i>community types present</i>) Spring overflow, confined area |
| X | | | 10) Riparian-wetland plants exhibit high vigor Still have surface water in mid-October |
| | X | | 11) Adequate riparian-wetland vegetative cover present to protect banks and dissipate energy during high flows (<i>enough</i>) There are areas that would scour along banks at high flow event |
| | | X | 12) Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery) No large woody plants present or available |
| X | | | 13) Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) adequate to dissipate energy |
| | | X | 14) Point bars are vegetating with riparian-wetland vegetation |
| X | | | 15) Lateral stream movement is associated with natural sinuosity Confined |
| X | | | 16) System is vertically stable (<i>not downcutting</i>) Stable for most point but some sidecuts where livestock impact system |
| | X | | 17) Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition) Sediment supplied from area surrounding spring where cattle denude and trample area |

SUMMARY DETERMINATION

REMARKS: Flow-thru system – trough waters 2 pastures – has overflow enclosure but overflow pipe is clogged. Riparian enclosure fence needs to be rebuilt and relocated closer to road, extended further down watershed. Water running down drainage +1000 ft. from spring and beyond enclosure boundary fence. Polyogon monspeliensis (annual rabbitsfoot grass) present, which is a annual grass of wet meadows, irrigated sites.
 RECOMMENDATION: Repair overflow pipe and leave as-is. Possibly, could float system, backup water at spring site, extend pipeline and place separate troughs in each pasture.

| | |
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| FUNTIONAL RATING: Functional-at-Risk | TREND: Upward |
| ARE CONTRIBUTING FACTORS OUTSIDE MANAGER CONTROL: No | FACTORS: |



Trough overflow from spring, 2011



Trough overflow from spring, 2011



Holbrook Spring Source

**Pocatello Field Office (Riparian Functional Assessment)
Lotic Checklist**

Date: 10/18/2011 Riparian Name: Josephson Spring Segment/Reach ID #:
 ID Team Observers: James Kumm, Eric Limbach Type (Spring/River) Spring fed creek
 GPS UTM: _____ Legal: T. S., R. E., Sec Size (Feet/Miles): _____ Measurement Type _____

Potential: _____

| Yes | No | N/A | HYDROLOGY/VEGETATION/EROSION-DEPOSITION |
|-----|----|-----|---|
| | | X | 1) Floodplain above bankfull is inundated in "relatively frequent" events |
| | | X | 2) Where beaver dams are present are they active and stable |
| | X | | 3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region) Livestock have trampled the area-stream to wide |
| | X | | 4) Riparian-wetland area is widening or has achieved potential extent See #3 |
| | X | | 5) Upland watershed is not contributing to riparian-wetland degradation Livestock congregate in area – not much vegetation |
| | X | | 6) Diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery) |
| | X | | 7) Diverse composition of riparian-wetland vegetation (for maintenance/recovery) <i>(species present)</i> Only species is Nebraska Sedge (just for 20 feet near overflow outlet) |
| | X | | 8) Species present indicate maintenance of riparian-wetland soil moisture characteristics See #7 |
| | X | | 9) Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events <i>(community types present)</i> See #7 |
| | X | | 10) Riparian-wetland plants exhibit high vigor Most have been heavily grazed |
| | X | | 11) Adequate riparian-wetland vegetative cover present to protect banks and dissipate energy during high flows <i>(enough)</i> Most banks are un-vegetated |
| | | X | 12) Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery) |
| | X | | 13) Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) adequate to dissipate energy No rocks or overflow channels observed |
| | | X | 14) Point bars are vegetating with riparian-wetland vegetation No point bars |
| X | | | 15) Lateral stream movement is associated with natural sinuosity Stream is confined to narrow draw |
| X | | | 16) System is vertically stable <i>(not downcutting)</i> No head cuts observed |
| | X | | 17) Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition) Extensive deposition in channel |

SUMMARY DETERMINATION

REMARKS: Developed as a flow-thru system, that waters 3 pastures – overflow water returns to drainage but is not protected.

 RECOMMENDATION: It would be a good idea to fence the overflow. Float system and return overflow to spring source. Overflow would run down drainage to troughs. OR Could fence the current overflow to restrict livestock from riparian area. Enclosure would require 2 cattleguards or move road around enclosure.

| | |
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| FUNTIONAL RATING: Nonfunctional | TREND: Not apparent |
| ARE CONTRIBUTING FACTORS OUTSIDE MANAGER CONTROL: No | FACTORS: |



Josephson Spring Source Exclosure



Trough Overflow from spring, 2011

**Pocatello Field Office (Riparian Functional Assessment)
Lotic Checklist**

Date: 10/5/2011 Riparian Name: Little Rock Spring Segment/Reach ID #:
 ID Team Observers: James Kumm, Eric Limbach Type (Spring/River) Spring fed creek
 GPS UTM: _____ Legal: T. S., R. E., Sec Size (Feet/Miles): _____ Measurement Type _____

Potential: _____

| Yes | No | N/A | HYDROLOGY/VEGETATION/EROSION-DEPOSITION |
|-----|----|-----|--|
| | | X | 1) Floodplain above bankfull is inundated in "relatively frequent" events Spring is source of water; which is piped to trough |
| | | X | 2) Where beaver dams are present are they active and stable |
| | X | | 3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region) No defined channel; bottom is wide and vegetated |
| | X | | 4) Riparian-wetland area is widening or has achieved potential extent Riparian buck & pole fence broken down since May of this year – cows got into riparian and trampled bottom |
| | X | | 5) Upland watershed is not contributing to riparian-wetland degradation How much water is diverted to trough? ? remains in channel? If fence is maintained, uplands would not be contributing, much of slopes above riparian are well vegetated. |
| | | X | 6) Diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery) Does not appear to have woody species-chokecherry is only large woody in area inside or outside riparian enclosure. |
| | X | | 7) Diverse composition of riparian-wetland vegetation (for maintenance/recovery) <i>(species present)</i> Few cattails, sedges-mostly annuals, and mostly grazed |
| | X | | 8) Species present indicate maintenance of riparian-wetland soil moisture characteristics See #7 |
| | X | | 9) Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events <i>(community types present)</i> See #7 |
| | X | | 10) Riparian-wetland plants exhibit high vigor See #7 |
| | X | | 11) Adequate riparian-wetland vegetative cover present to protect banks and dissipate energy during high flows <i>(enough)</i> See #5 – livestock grazing has adversely impacted riparian vegetation |
| X | | | 12) Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery) There were some rocks but no woody materials. |
| | X | | 13) Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) adequate to dissipate energy Only rocks present to dissipate energy, no other describable materials. |
| | | X | 14) Point bars are vegetating with riparian-wetland vegetation Don't exist here |
| X | | | 15) Lateral stream movement is associated with natural sinuosity Constricted drainage, lateral movement okay within their confines. |
| X | | | 16) System is vertically stable <i>(not downcutting)</i> No headcuts |
| X | | | 17) Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition) Some deposition but not excessive |

SUMMARY DETERMINATION

REMARKS: Developed as a flow-thru system – water is piped to troughs with overflow from trough returns to drainage that is fenced..
 RECOMMENDATION: Riparian fence needs serious repair & maintenance, and be anchored. 1. Fix overflow pipe (rebury) so it flows into riparian enclosure and leave entire system configuration as-is. OR 2. Float troughs and let water backup into spring source. OR 3. Move trough down drainage to rocky hillside east of current fence to move cattle away from spring area. Fence remainder of archy site; cows would congregate less and not push on fence.
 It would be a good idea to fence the overflow. It is fenced on one side – would need to fence 3 sides and install 2 gates or cattleguards.

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| FUNTIONAL RATING: Nonfunctional-Very little riparian vegetation present, cows have trampled banks, compaction, hoof prints in bottom | TREND: Not apparent |
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| ARE CONTRIBUTING FACTORS OUTSIDE MANAGER CONTROL: No | FACTORS: |
|--|----------|



Little Rock Spring Source



Little Rock Spring Enclosure



Little Rock Spring Vegetation

**Pocatello Field Office (Riparian Functional Assessment)
Lotic Checklist**

Date: 10/3/2011 Riparian Name: Lost Spring (Exclosure) Segment/Reach ID #:
 ID Team Observers: James Kumm, Eric Limbach Type (Spring/River) Spring fed creek
 GPS UTM: _____ Legal: T. S., R. E., Sec Size (Feet/Miles): _____ Measurement Type _____

Potential: _____

| Yes | No | N/A | HYDROLOGY/VEGETATION/EROSION-DEPOSITION |
|-----|----|-----|---|
| | X | | 1) Floodplain above bankfull is inundated in "relatively frequent" events No real stream channel or riparian area present except within spring exclosure – surface water |
| | | X | 2) Where beaver dams are present are they active and stable |
| | X | | 3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region) No stream channel outside exclosure |
| | X | | 4) Riparian-wetland area is widening or has achieved potential extent Riparian area does not occur outside exclosure |
| X | | | 5) Upland watershed is not contributing to riparian-wetland degradation Much cover in upland areas |
| | | | 6) Diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery) Nebr. Sedge outside spring exclosure in dry land conditions; must be sub-irrigated |
| | X | | 7) Diverse composition of riparian-wetland vegetation (for maintenance/recovery) (<i>species present</i>) |
| | X | | 8) Species present indicate maintenance of riparian-wetland soil moisture characteristics |
| X | | | 9) Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events (<i>community types present</i>) Not riparian community |
| | | X | 10) Riparian-wetland plants exhibit high vigor |
| X | | | 11) Adequate riparian-wetland vegetative cover present to protect banks and dissipate energy during high flows (<i>enough</i>) |
| | X | | 12) Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery) |
| | X | | 13) Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) adequate to dissipate energy |
| | | X | 14) Point bars are vegetating with riparian-wetland vegetation |
| | X | | 15) Lateral stream movement is associated with natural sinuosity |
| X | | | 16) System is vertically stable (<i>not downcutting</i>) |
| X | | | 17) Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition) Seep from spring only within exclosure |

SUMMARY DETERMINATION

REMARKS: Spring is enclosed. Overflow develops mud hole. Can has valve shutoff to trough. CANE grows outside exclosure on upland site. Water maybe sub-irrigates plants; no saturated channel that comes out of spring exclosure.

RECOMMENDATION: *Float system, return overflow to spring source, fence a portion of the drainage to develop a riparian area.*

| | |
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| FUNTIONAL RATING: Nonfunctional | TREND: Not apparent |
| ARE CONTRIBUTING FACTORS OUTSIDE MANAGER CONTROL: No | FACTORS: |



Lost Spring Source and Headbox



Lost Spring Exclosure, 2011

**Pocatello Field Office (Riparian Functional Assessment)
Lotic Checklist**

Date: 10/4/2011 Riparian Name: Meadow Brook Spring Segment/Reach ID #:
 ID Team Observers: James Kumm, Eric Limbach Type (Spring/River) Spring fed creek
 GPS UTM: _____ Legal: T. S., R. E., Sec Size (Feet/Miles): _____ Measurement Type _____

Potential: _____

| Yes | No | N/A | HYDROLOGY/VEGETATION/EROSION-DEPOSITION |
|-----|----|-----|---|
| | | X | 1) Floodplain above bankfull is inundated in "relatively frequent" events Spring is source of water |
| | | X | 2) Where beaver dams are present are they active and stable |
| X | | | 3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region) |
| X | | | 4) Riparian-wetland area is widening or has achieved potential extent Riparian area covers bottom of draw |
| X | | | 5) Upland watershed is not contributing to riparian-wetland degradation Good vegetation cover in uplands, side slopes |
| X | | | 6) Diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery) Willows from 1-15 feet tall |
| X | | | 7) Diverse composition of riparian-wetland vegetation (for maintenance/recovery) <i>(species present)</i> Willow, rose, cattails, bulrush, sedges |
| X | | | 8) Species present indicate maintenance of riparian-wetland soil moisture characteristics See #7 |
| X | | | 9) Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events <i>(community types present)</i> See #7 |
| X | | | 10) Riparian-wetland plants exhibit high vigor Some willow had been pruned by fire |
| X | | | 11) Adequate riparian-wetland vegetative cover present to protect banks and dissipate energy during high flows <i>(enough)</i> Almost all bank was vegetated |
| | | X | 12) Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery) Large woody not part of system |
| X | | | 13) Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) adequate to dissipate energy There are some rocks |
| | | X | 14) Point bars are vegetating with riparian-wetland vegetation Stream channel incised-no point bars |
| X | | | 15) Lateral stream movement is associated with natural sinuosity Stream cannot wander much – incised |
| X | | | 16) System is vertically stable <i>(not downcutting)</i> No head cuts observed |
| X | | | 17) Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition) No excessive erosion observed |

SUMMARY DETERMINATION

REMARKS: Meadow Brook Riparian area (BLM) is within a ~100 acre enclosure. Full complement of riparian vegetation. Water is removed for livestock, stream is excluded for livestock

RECOMMENDATION: Preventative Action: Enclose pump to prevent oil/fuel leaks from entering water.

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| FUNTIONAL RATING: Proper Functioning Condition | TREND: Upward |
| ARE CONTRIBUTING FACTORS OUTSIDE MANAGER CONTROL: No | FACTORS: |



Meadowbrook Spring, 2011



Willows



Meadowbrook Spring Vegetation

**Pocatello Field Office (Riparian Functional Assessment)
Lotic Checklist**

Date: 10/4/2011 Riparian Name: North Canyon Stream (Curlew) Segment/Reach ID #:
 ID Team Observers: James Kumm, Eric Limbach Type (Spring/River) Spring fed creek
 GPS UTM: _____ Legal: T. S., R. E., Sec Size (Feet/Miles): _____ Measurement Type _____

Potential: _____

| Yes | No | N/A | HYDROLOGY/VEGETATION/EROSION-DEPOSITION |
|-----|----|-----|---|
| | | X | 1) Floodplain above bankfull is inundated in "relatively frequent" events Stream originates from spring |
| | | X | 2) Where beaver dams are present are they active and stable |
| X | | | 3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region) The stream is at the bottom of trench-cannot move around much |
| X | | | 4) Riparian-wetland area is widening or has achieved potential extent Riparian vegetation has covered the bottom of the trench |
| | X | | 5) Upland watershed is not contributing to riparian-wetland degradation Stream is entrenched – 30 feet of bare soil on both sides of stream |
| X | | | 6) Diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery) The transplanted willows appear to be spreading – range from 1 foot to 20 feet tall |
| X | | | 7) Diverse composition of riparian-wetland vegetation (for maintenance/recovery) (<i>species present</i>) Willow, cattail, sedges (Nebraska), Juncus, rose, and watercress |
| X | | | 8) Species present indicate maintenance of riparian-wetland soil moisture characteristics See #7 |
| X | | | 9) Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events (<i>community types present</i>) See #7 |
| X | | | 10) Riparian-wetland plants exhibit high vigor Seedheads present |
| X | | | 11) Adequate riparian-wetland vegetative cover present to protect banks and dissipate energy during high flows (<i>enough</i>) Very little bare stream bank present. Elk wallows had knocked down some vegetation |
| | | X | 12) Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery) Stream does not require large woody for stable riparian area |
| | X | | 13) Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) adequate to dissipate energy The stream was entrenched and overflow channel are not present |
| | | X | 14) Point bars are vegetating with riparian-wetland vegetation Basically the entrenchment does not allow bars to develop |
| X | | | 15) Lateral stream movement is associated with natural sinuosity Once again entrenchment reduces sinuosity |
| X | | | 16) System is vertically stable (<i>not downcutting</i>) No headcuts were observed |
| | X | | 17) Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition) The bare banks (30 ft.) are a source of excess sediment. Water shows slight turbidity |

SUMMARY DETERMINATION

REMARKS: North Canyon Riparian Enclosure is ~ 145 acres, which includes pump house development at spring that waters multiple pastures. Forest Service is also tapped into spring. The stretch of stream evaluated is inside a livestock enclosure. Fence has been effective in reducing livestock use of riparian area. Water for livestock (both BLM & FS) is piped from spring. Riparian vegetation inside enclosure is robust & healthy with diversity of rip species.

RECOMMENDATION: *Ensure maintenance of riparian enclosure AND close enclosure to grazing (Decision).*

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| FUNTIONAL RATING: Functional-At Risk | TREND: Upward |
| ARE CONTRIBUTING FACTORS OUTSIDE MANAGER CONTROL: No | FACTORS: |



North Canyon Stream

**Pocatello Field Office (Riparian Functional Assessment)
Lotic Checklist**

Date: 7/26/2011 Riparian Name: Rose Spring Segment/Reach ID #:
 ID Team Observers: James Kumm, Eric Limbach, Karen Kraus, Amy Lapp Type (Spring/River) Spring fed creek
 GPS UTM: _____ Legal: T. S., R. E., Sec Size (Feet/Miles): _____ Measurement Type _____

Potential: _____

| Yes | No | N/A | HYDROLOGY/VEGETATION/EROSION-DEPOSITION |
|-----|----|-----|---|
| | | X | 1) Floodplain above bankfull is inundated in "relatively frequent" events Spring feeds trough, which overflows into shallow stock pond; no flood plain |
| | | X | 2) Where beaver dams are present are they active and stable |
| X | | | 3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region) +severe cattle use in vicinity of trough and pond |
| | X | | 4) Riparian-wetland area is widening or has achieved potential extent See #1 |
| X | | | 5) Upland watershed is not contributing to riparian-wetland degradation Very level area between spring and trough/pond |
| | X | | 6) Diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery) No riparian vegetation outside of enclosure |
| | X | | 7) Diverse composition of riparian-wetland vegetation (for maintenance/recovery) <i>(species present)</i> Nebraska sedge in pond is only riparian species present |
| X | | | 8) Species present indicate maintenance of riparian-wetland soil moisture characteristics |
| ? | ? | | 9) Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events <i>(community types present)</i> Inside enclosure=Yes, Outside enclosure=No |
| | | X | 10) Riparian-wetland plants exhibit high vigor Livestock concentration area, severe use, trampling |
| ? | ? | | 11) Adequate riparian-wetland vegetative cover present to protect banks and dissipate energy during high flows <i>(enough)</i> Inside enclosure=Yes, Outside enclosure=No |
| | | X | 12) Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery) |
| X | | | 13) Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) adequate to dissipate energy |
| | | X | 14) Point bars are vegetating with riparian-wetland vegetation |
| X | | | 15) Lateral stream movement is associated with natural sinuosity |
| X | | | 16) System is vertically stable <i>(not downcutting)</i> |
| X | | | 17) Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition) This is an 8-10" precipitation zone. Low slope, no apparent erosion |

SUMMARY DETERMINATION

REMARKS: Developed as a flow-thru system that waters two pastures with separate troughs. Has two unfenced over-flow ponds. Spring source is protected with a pole fence enclosure. South pond is silted-in.

RECOMMENDATION: 1. Move gate to spring head to opposite end of enclosure; close present gate permanently with 3-poles. 2. Move overflow from trough further away maybe >1000 ft. down natural drainage (ESE direction). Could flow troughs and use enclosure for excess water (may to enlarge enclosure). Float troughs and move ponds farther from trough, or remove ponds and let water develop flowing riparian system. It would be better if all excess water went into one riparian area. Fence riparian area

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| FUNCTIONAL RATING: Functional-At Risk | TREND: No Apparent |
| ARE CONTRIBUTING FACTORS OUTSIDE MANAGER CONTROL: No | FACTORS: |



Rose Spring Source 2014



Trough Overflow from Trough Pond #1



Trough Overflow from Trough Pond #2

**Pocatello Field Office (Riparian Functional Assessment)
Lotic Checklist**

Date: 10/4/2011 Riparian Name: Willow Spring Segment/Reach ID #:
 ID Team Observers: James Kumm, Eric Limbach Type (Spring/River) Spring fed creek
 GPS UTM: _____ Legal: T. S., R. E., Sec Size (Feet/Miles): _____ Measurement Type _____

Potential: _____

| Yes | No | N/A | HYDROLOGY/VEGETATION/EROSION-DEPOSITION |
|-----|----|-----|--|
| | | X | 1) Floodplain above bankfull is inundated in "relatively frequent" events Spring is main source of water |
| | | X | 2) Where beaver dams are present are they active and stable |
| | X | | 3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region) Livestock trampling has broken down stream bank-widened stream |
| X | | | 4) Riparian-wetland area is widening or has achieved potential extent |
| X | | | 5) Upland watershed is not contributing to riparian-wetland degradation Uplands are well vegetated |
| | | X | 6) Diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery) Woody vegetation is not present on area |
| X | | | 7) Diverse composition of riparian-wetland vegetation (for maintenance/recovery) <i>(species present)</i> Nebraska sedge-rushes |
| X | | | 8) Species present indicate maintenance of riparian-wetland soil moisture characteristics See #7 |
| X | | | 9) Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events <i>(community types present)</i> See #7 |
| | X | | 10) Riparian-wetland plants exhibit high vigor Plants appear to be heavily grazed and trampled |
| | X | | 11) Adequate riparian-wetland vegetative cover present to protect banks and dissipate energy during high flows <i>(enough)</i> Livestock trampling has degraded the bank vegetation |
| | | X | 12) Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery) Not required for this area |
| | | | 13) Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) adequate to dissipate energy Herbaceous vegetation is sufficient |
| | | X | 14) Point bars are vegetating with riparian-wetland vegetation No point bars are present |
| X | | | 15) Lateral stream movement is associated with natural sinuosity |
| X | | | 16) System is vertically stable <i>(not downcutting)</i> No head cuts were observed |
| X | | | 17) Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition) No excessive erosion observed |

SUMMARY DETERMINATION

REMARKS: There is an enclosure on part of the stream but the gates were apparently left open during the 2001 grazing season. The lower portion of the stream could also be fenced. Developed with a floated-trough – overflow is delivered to drainage ~ 200 ft. below spring source. Has small enclosure around riparian area that needs to be enlarged. Road goes through enclosure; gates are usually left open allowing livestock to (over)use riparian area every year.

RECOMMENDATION: Float system to backup water into spring source; Enlarge enclosure; Move fence so that road is outside enclosure OR reroute road around enclosure. In either case, this would help to keep livestock out of riparian area.

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| FUNCTIONAL RATING: Functional-At Risk | TREND: Not Apparent |
| ARE CONTRIBUTING FACTORS OUTSIDE MANAGER CONTROL: No | FACTORS: |



Willow Spring Enclosure



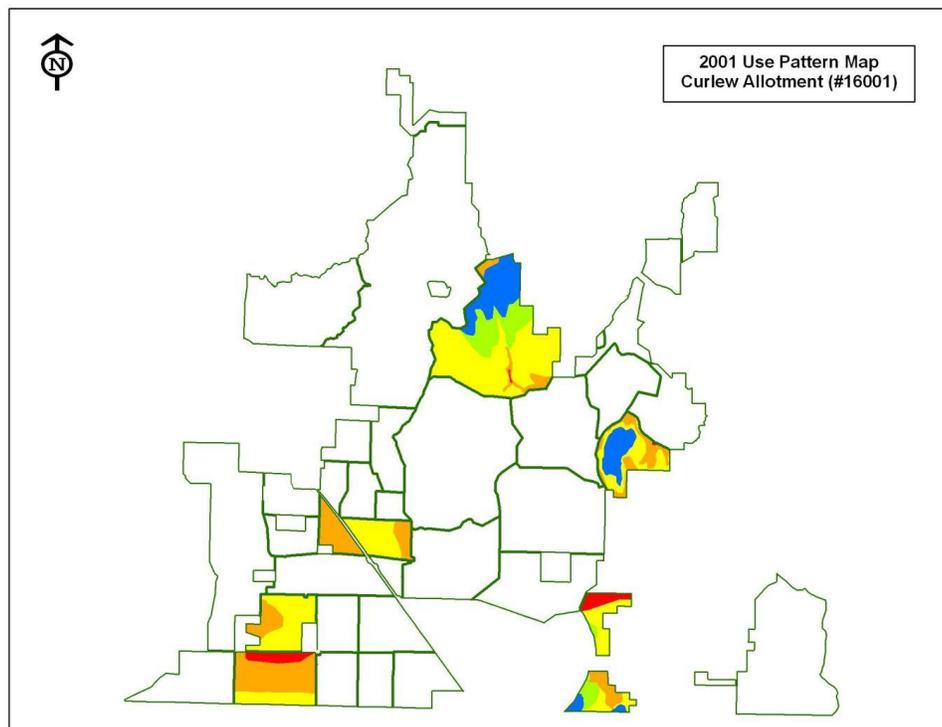
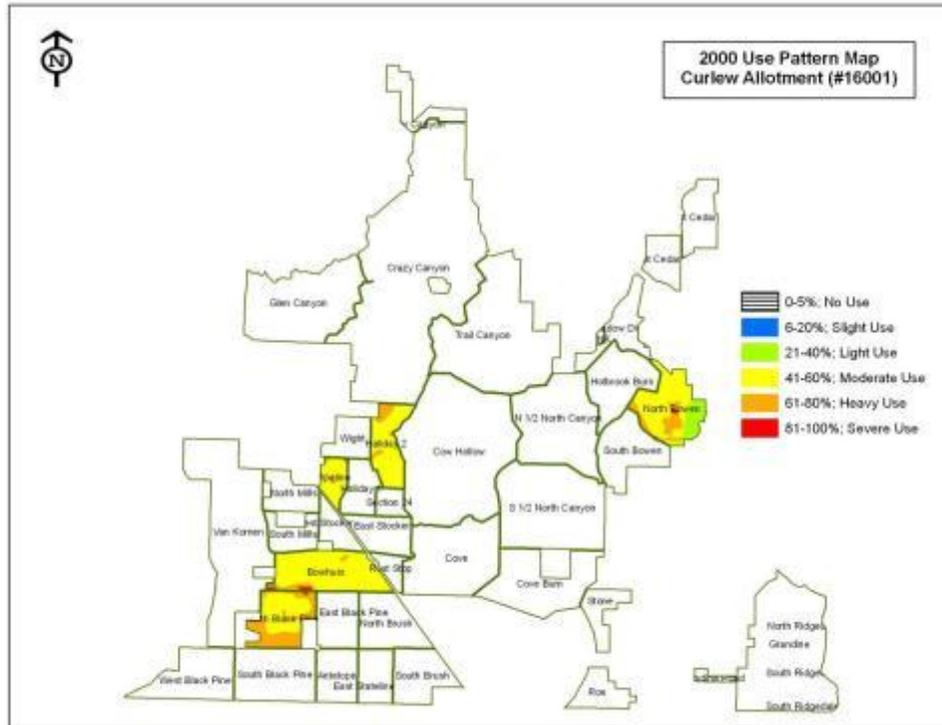
Willow Spring Source



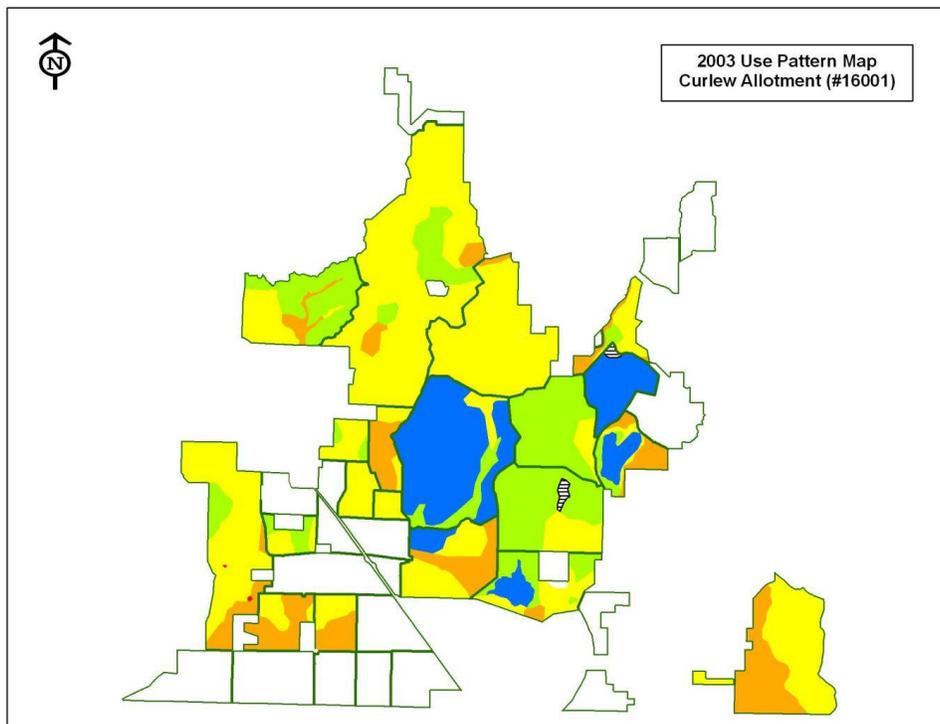
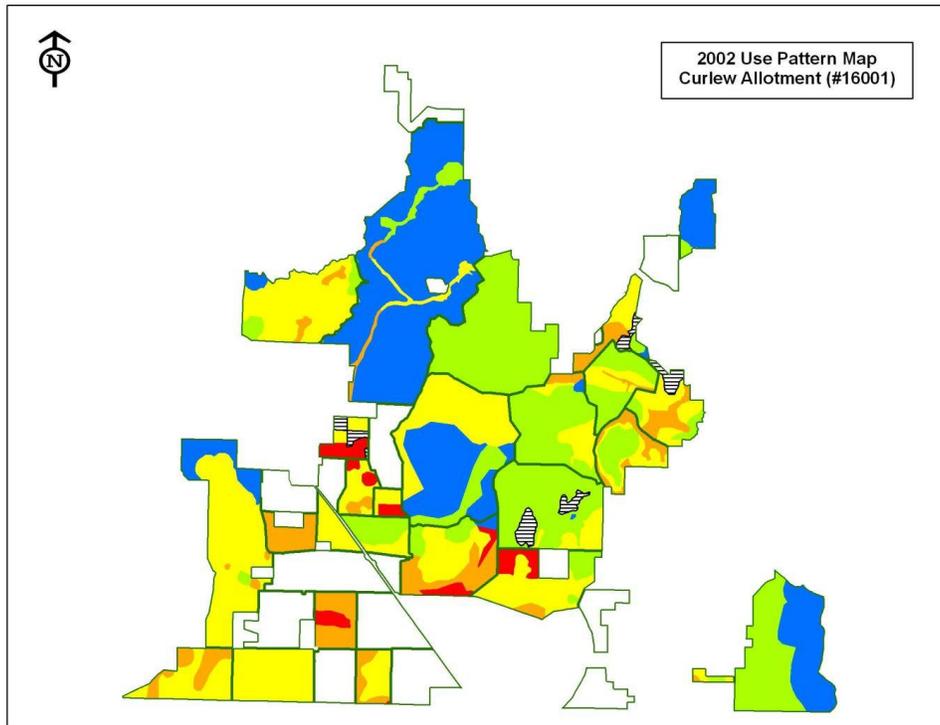
Willow Spring Source

APPENDIX D: USE PATTERN MAPS (2000-2012)

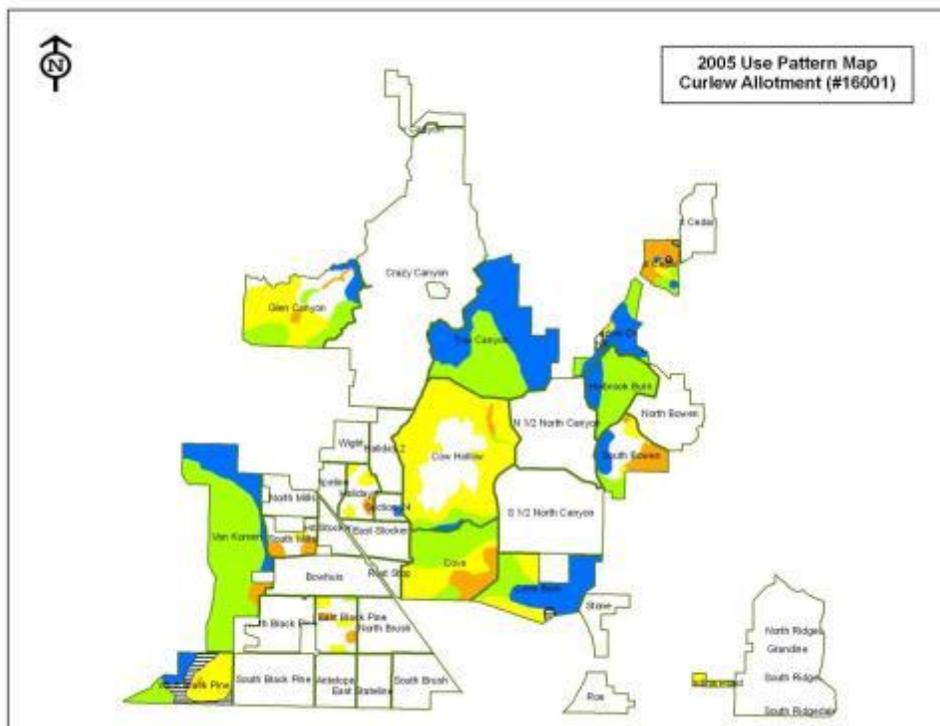
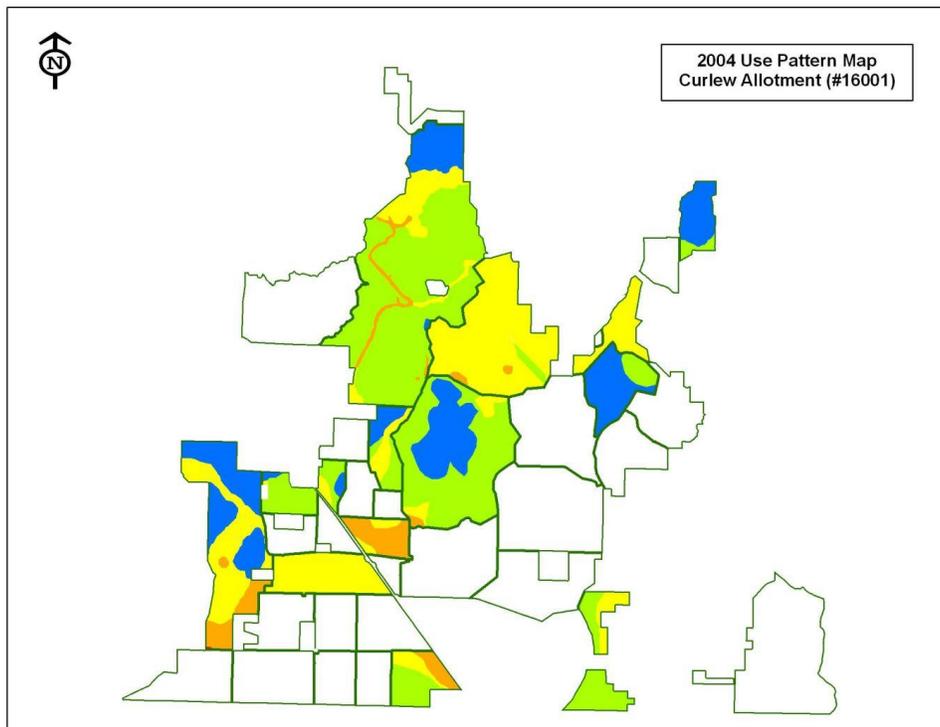
Blank pastures were not surveyed



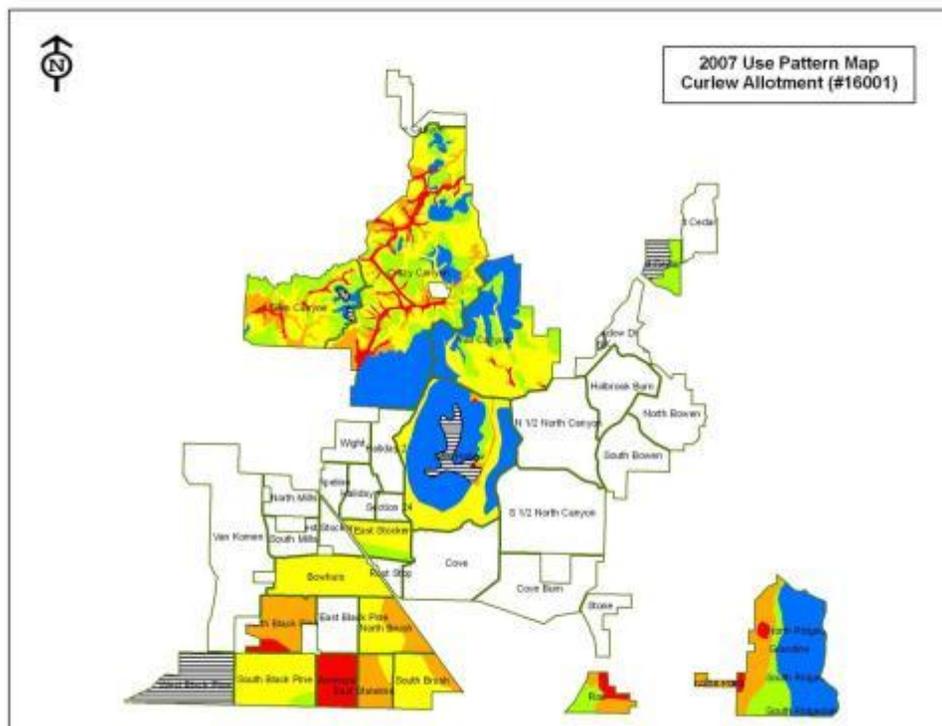
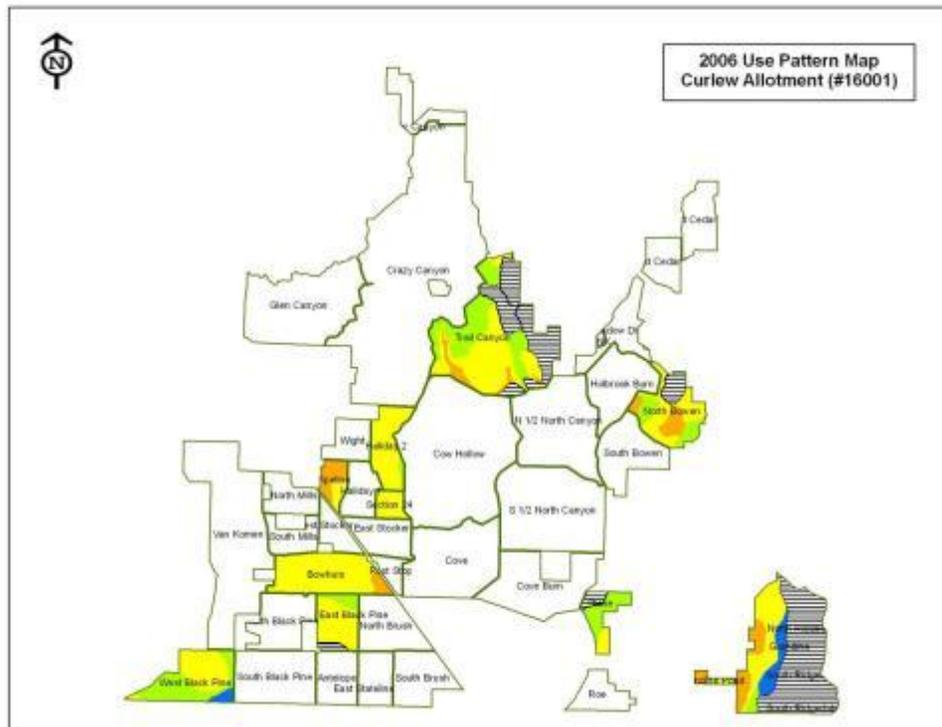
Blank pastures were not surveyed



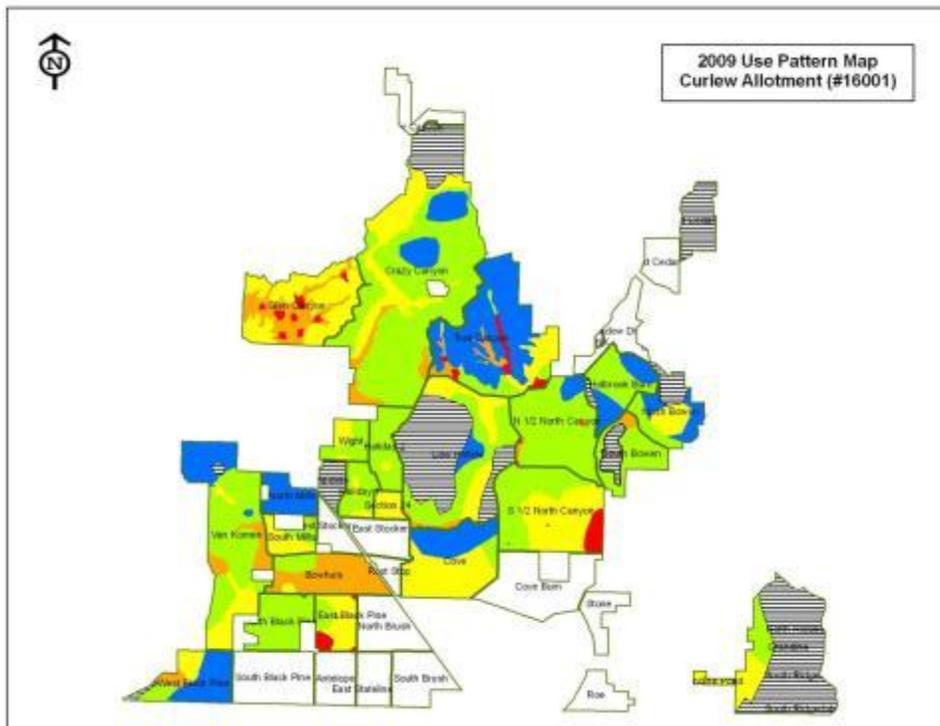
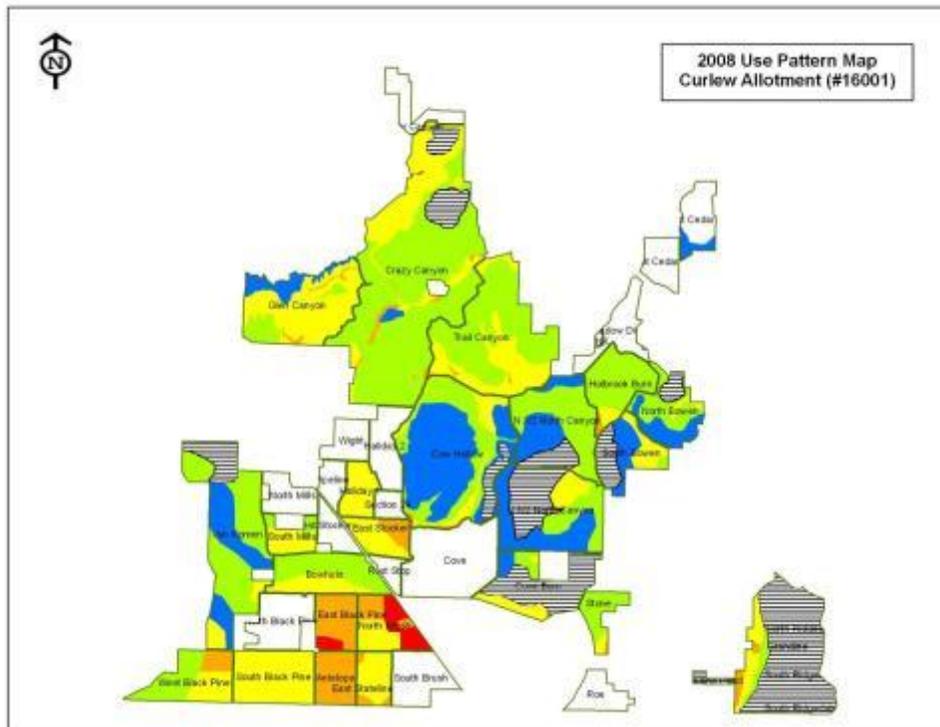
Blank pastures were not surveyed



Blank pastures were not surveyed



Blank pastures were not surveyed



Blank pastures were not surveyed

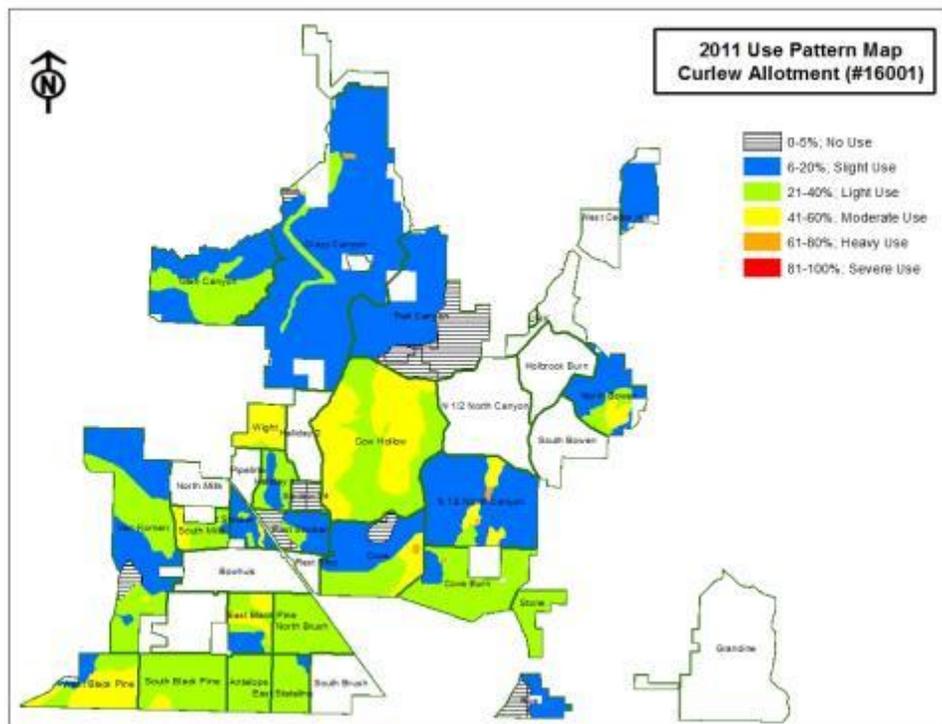
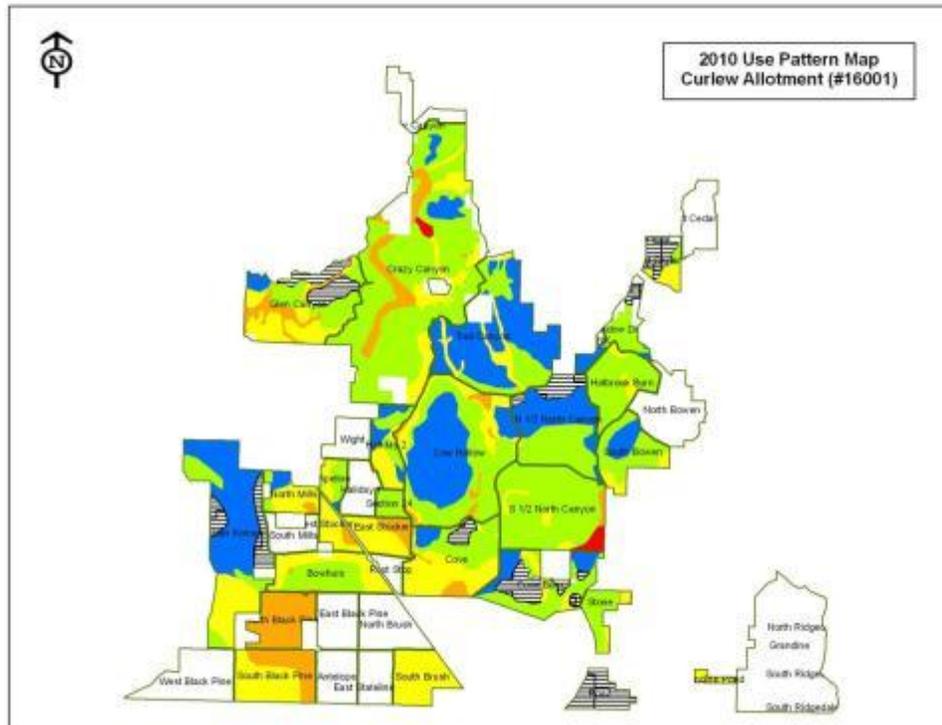


Figure E-2: Map of Sage Grouse Habitat Assessment locations for 2000, 2011 and 2012.

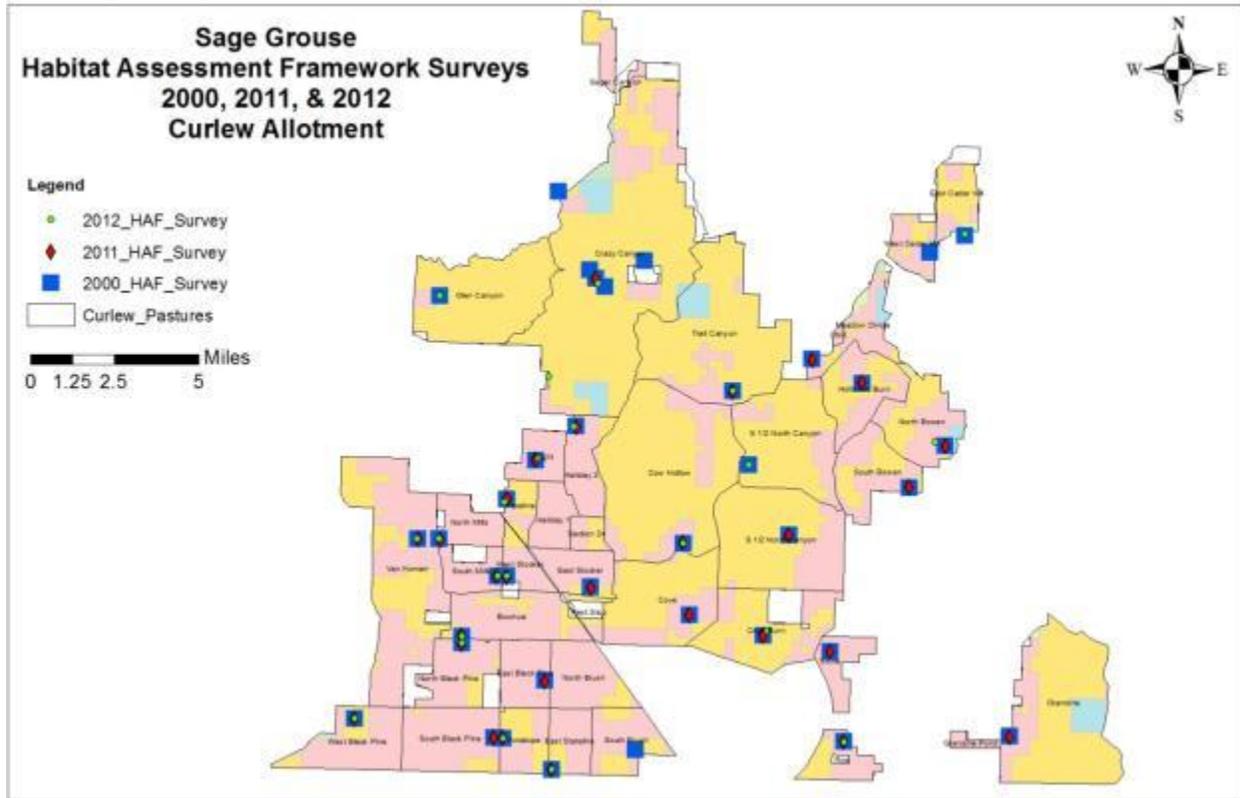


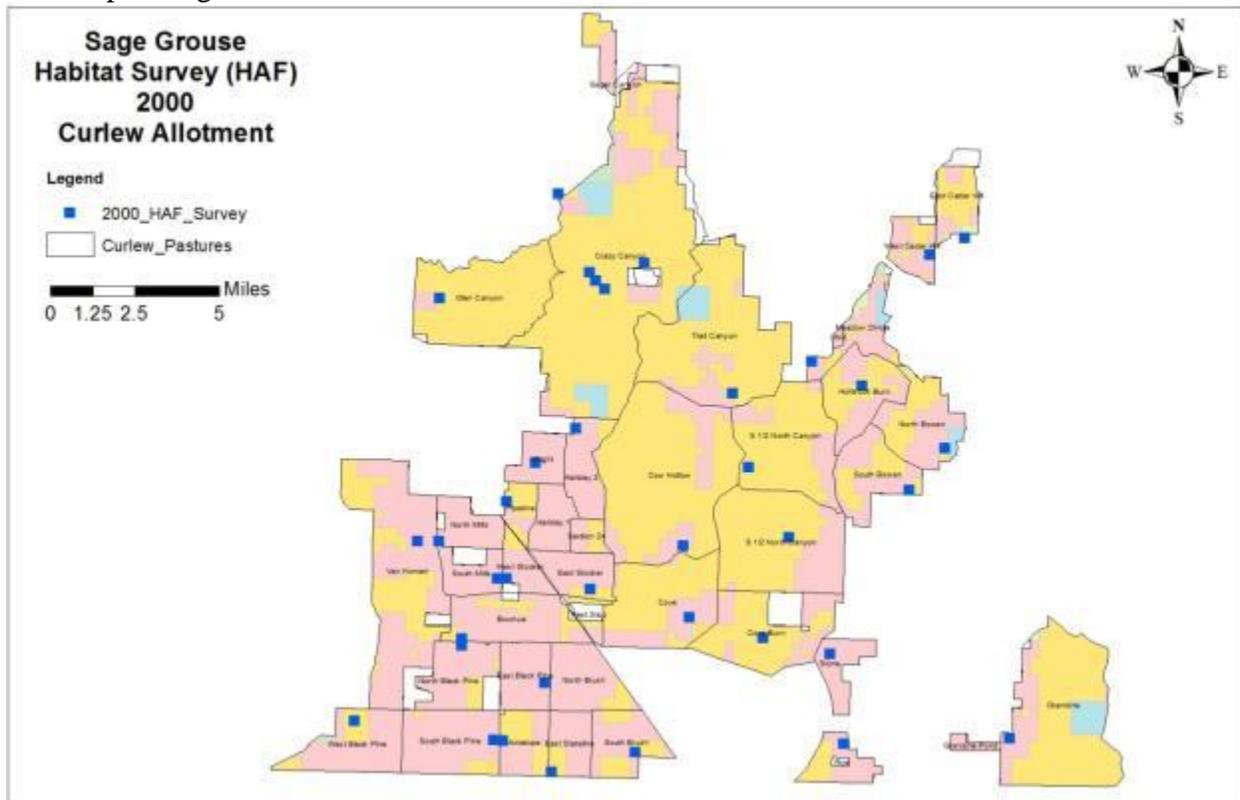
Table E-1 below describes attributes used for determining sage grouse breeding habitat suitability and what constitutes suitable habitat, marginal habitat, and unsuitable habitat for each. These same values were used in both 2000 and 2011.

Table E-1: Attributes used for assessing sage grouse breeding habitat.

| Habitat Indicator | Suitable Habitat | Marginal Habitat | Unsuitable Habitat |
|--|--|--|---|
| Average Big Sagebrush Canopy Cover | ≥15% but ≤ 25% | 10-14% or 26-35% | <10 % or > 35% |
| Average Big Sagebrush Height | 15-30" | 10-14" or 31-40" | < 10" or > 40" |
| Big Sagebrush Growth Form | Spreading form, few, if any, dead branches for most plants | Mix of spreading and columnar growth forms present | Tall, columnar growth form with dead branches for most plants |
| Average herbaceous Grass and Forb Height | ≥ 7" | 5-7" | < 5" |
| Average Grass Canopy Cover | ≥ 15% | 5-14% | < 5% |
| Average Forb Canopy Cover | ≥ 10% | 5-9% | < 5% |
| Forb Richness | High | Low | Very Low |

2000 Sage Grouse Habitat Assessment

Figure E-3: Map of Sage Grouse Habitat Assessment locations for 2000.



Four of the thirty-five sites were found to be suitable sage grouse breeding habitat. Nine were found to be marginal and twenty-one were found to be unsuitable. Table E-2 below summarizes the results of the 2000 sage grouse habitat surveys. Values identified in table E-1 above were used for the assessment.

Table E-2: 2000 Sage Grouse Breeding Habitat assessment by pasture.

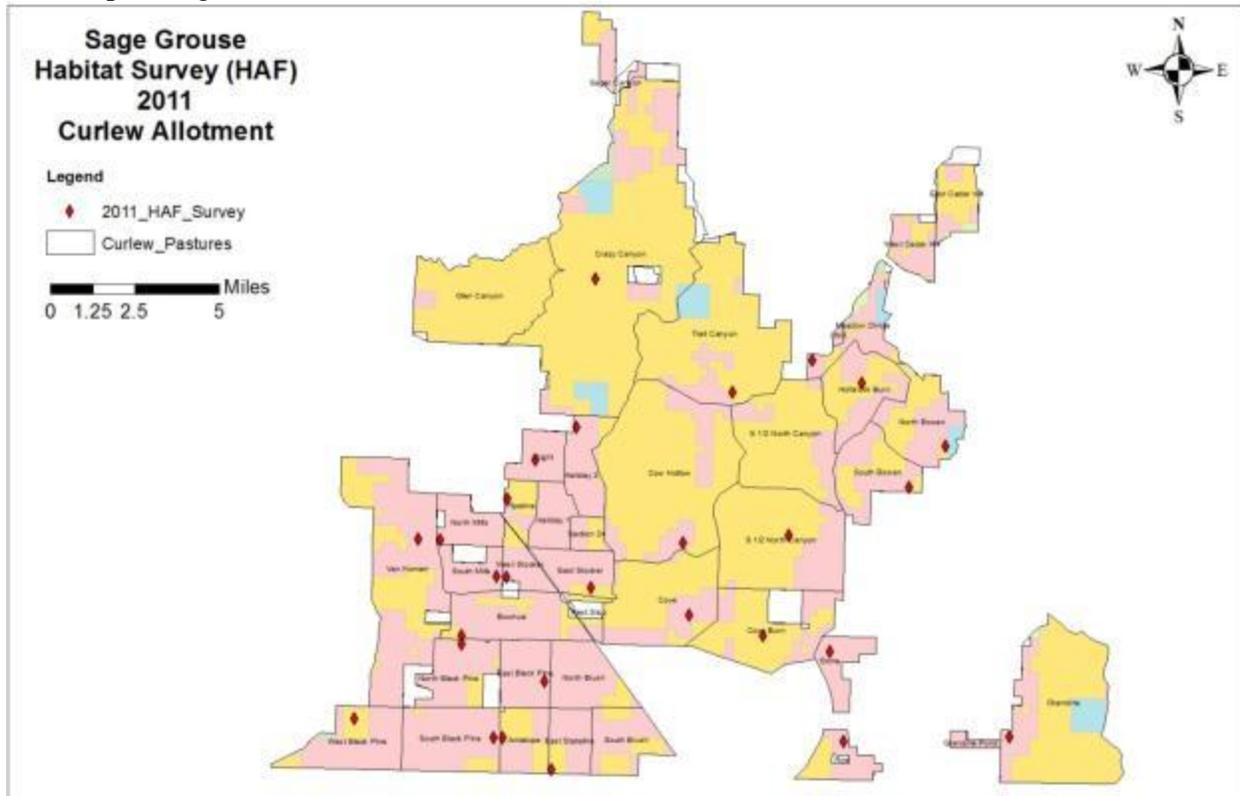
| Pasture Name/ Plot # | Overall Rating for Breeding Habitat | Average Big Sagebrush Canopy Cover | Average Big Sagebrush Height | Big Sagebrush Growth Form | Average Herbaceous Grass and Forb Height | Average Grass Canopy Cover | Average Forb Canopy Cover | Forb Richness |
|----------------------|-------------------------------------|------------------------------------|------------------------------|---------------------------|--|----------------------------|---------------------------|---------------|
| Antelope #9 | Unsuitable | Unsuitable | Unsuitable | ** | Marginal | Suitable | ** | Unsuitable |
| Bowhuis #20 | Unsuitable | Unsuitable | Suitable | Marginal | Unsuitable | Suitable | Unsuitable | Unsuitable |
| Cove #27 | Suitable | Suitable | Suitable | Suitable | Suitable | Suitable | Unsuitable | Unsuitable |
| Cove Burn #28 | Unsuitable | Unsuitable | Unsuitable | ** | Suitable | Suitable | Unsuitable | Suitable |
| Cow Hollow #11 | Unsuitable | Unsuitable | Suitable | Marginal | Suitable | Suitable | Marginal | Suitable |
| Crazy Canyon #2 | Unsuitable | Unsuitable | Suitable | ** | Marginal | Suitable | Marginal | Suitable |
| Crazy Canyon #3 | Marginal | Suitable | Marginal | Marginal | Suitable | Suitable | Suitable | Marginal |
| Crazy Canyon #4 | Marginal | Marginal | Suitable | Suitable | Marginal | Suitable | Marginal | Suitable |

| Pasture Name/ Plot # | Overall Rating for Breeding Habitat | Average Big Sagebrush Canopy Cover | Average Big Sagebrush Height | Big Sagebrush Growth Form | Average Herbaceous Grass and Forb Height | Average Grass Canopy Cover | Average Forb Canopy Cover | Forb Richness |
|------------------------|-------------------------------------|------------------------------------|------------------------------|---------------------------|--|----------------------------|---------------------------|---------------|
| E. Black Pine #10 | Unsuitable | Unsuitable | Suitable | ** | Unsuitable | Marginal | Unsuitable | Unsuitable |
| E. Cedar Hill #32 | Marginal | Marginal | Suitable | Suitable | Marginal | Suitable | Marginal | Suitable |
| E. Stateline #23 | Unsuitable | Unsuitable | Suitable | Marginal | Unsuitable | Suitable | Unsuitable | Unsuitable |
| E. Stocker #26 | Marginal | Suitable | Suitable | Suitable | Marginal | Suitable | Unsuitable | Unsuitable |
| Glen Canyon #1 | Marginal | Marginal | Suitable | ** | Suitable | Suitable | Unsuitable | Marginal |
| Grandine/G.P #34 | Unsuitable | Marginal | Suitable | Suitable | Unsuitable | Suitable | Unsuitable | Unsuitable |
| Holiday-1 | ** | ** | ** | ** | ** | ** | ** | ** |
| Holiday-2 #6 | Marginal | Suitable | Suitable | ** | Suitable | Suitable | Unsuitable | Marginal |
| Holbrook Burn #13 | Marginal | Marginal | Suitable | ** | Suitable | Suitable | Unsuitable | Marginal |
| Meadowbrook Divide #15 | Unsuitable | Unsuitable | Suitable | Unsuitable | Unsuitable | Suitable | Unsuitable | Unsuitable |
| N. Black Pine #21 | Unsuitable | Unsuitable | Suitable | Unsuitable | Suitable | Suitable | Unsuitable | Unsuitable |
| N. Brush | ** | ** | ** | ** | ** | ** | ** | ** |
| N. Bowen #12 | Unsuitable | Unsuitable | Unsuitable | ** | Unsuitable | Marginal | Marginal | Marginal |
| North Canyon #14 | Suitable | Suitable | Suitable | Suitable | Marginal | Suitable | Marginal | Suitable |
| N. Mills #17 | Suitable | Suitable | Suitable | | Suitable | Suitable | Unsuitable | Marginal |
| Pipeline #25 | Unsuitable | Unsuitable | Suitable | Suitable | Unsuitable | Suitable | Unsuitable | Unsuitable |
| Roe #30 | Unsuitable | Unsuitable | Suitable | Suitable | Marginal | Suitable | Unsuitable | Marginal |
| Section 24 | ** | ** | ** | ** | ** | ** | ** | ** |
| S. Black Pine #8 | Unsuitable | Unsuitable | Marginal | Marginal | Marginal | Suitable | Unsuitable | Unsuitable |
| S. Brush #24 | Unsuitable | Marginal | Suitable | Suitable | Unsuitable | Marginal | Unsuitable | Unsuitable |
| S. Bowen #33 | Unsuitable | Unsuitable | Suitable | Suitable | Suitable | Suitable | Unsuitable | Marginal |
| S. Mills #18 | Suitable | Suitable | Suitable | Marginal | Suitable | Suitable | Unsuitable | Unsuitable |
| Stone #29 | Unsuitable | Unsuitable | Suitable | Marginal | Marginal | Suitable | Unsuitable | Unsuitable |
| Trail Canyon #7 | Unsuitable | Unsuitable | Suitable | Marginal | Suitable | Suitable | Suitable | Suitable |
| Van Koman #16 | Marginal | Marginal | Suitable | Marginal | Marginal | Marginal | Marginal | Marginal |
| W. Black Pine #22 | Marginal | Suitable | Suitable | Marginal | Marginal | Suitable | Unsuitable | Marginal |
| W. Cedar Hill #31 | Unsuitable | Unsuitable | Suitable | Suitable | Suitable | Suitable | Unsuitable | Marginal |
| W. Stocker #19 | Unsuitable | Unsuitable | Unsuitable | Marginal | Suitable | Suitable | Unsuitable | Unsuitable |
| Wight #5 | Unsuitable | Unsuitable | Suitable | Unsuitable | Marginal | Suitable | Unsuitable | Marginal |

** depicts sites where data is not available.

2011 Sage Grouse Habitat Assessment

Figure E-4: Map of Sage Grouse Habitat Assessment locations for 2011.



One of the twenty-eight sites that were resampled in 2011 was suitable sage grouse breeding habitat. Twelve were marginal and fifteen were unsuitable. Table E-3 below summarizes the results of the 2011 sage grouse habitat surveys. Values identified in table E-1 were used in the assessment.

Table E-3: 2011 Sage Grouse Breeding Habitat assessment by pasture.

| Pasture Name/ Plot # | Overall Rating for Breeding Habitat | Average Sagebrush Canopy Cover | Average Sagebrush Height | Sagebrush Growth Form | Average Herbaceous Grass and Forb Height | Average Grass Canopy Cover | Average Forb Canopy Cover | Forb Richness |
|----------------------|-------------------------------------|--------------------------------|--------------------------|-----------------------|--|----------------------------|---------------------------|---------------|
| Antelope #9 | Unsuitable | Unsuitable | Suitable | ** | Suitable | Unsuitable | Unsuitable | Marginal |
| Bowhuis #20 | Marginal | Marginal | Suitable | ** | Suitable | Suitable | Unsuitable | Unsuitable |
| Cove #27 | Unsuitable | Unsuitable | Suitable | ** | Suitable | Suitable | Unsuitable | Unsuitable |
| Cove Burn #28 | Unsuitable | Unsuitable | Suitable | ** | Suitable | Suitable | Unsuitable | Unsuitable |
| Cow Hollow #11 | Marginal | Suitable | Suitable | ** | Marginal | Suitable | Unsuitable | Unsuitable |
| Crazy Canyon #2 | ** | ** | ** | ** | ** | ** | ** | ** |
| Crazy Canyon #3,4 | Marginal | Marginal | Marginal | ** | ** | ** | ** | ** |
| E. Black Pine #10 | Marginal | Suitable | Suitable | ** | Suitable | Suitable | Unsuitable | Marginal |
| E. Cedar Hill | ** | ** | ** | ** | ** | ** | ** | ** |
| E. Stateline #23 | Unsuitable | Unsuitable | Marginal | ** | Suitable | Suitable | Unsuitable | Marginal |
| E. Stocker #26 | Marginal | Suitable | Marginal | ** | Suitable | Suitable | Unsuitable | Unsuitable |
| Glen Canyon | ** | ** | ** | ** | ** | ** | ** | ** |

| Pasture Name/ Plot # | Overall Rating for Breeding Habitat | Average Sagebrush Canopy Cover | Average Sagebrush Height | Sagebrush Growth Form | Average Herbaceous Grass and Forb Height | Average Grass Canopy Cover | Average Forb Canopy Cover | Forb Richness |
|------------------------|-------------------------------------|--------------------------------|--------------------------|-----------------------|--|----------------------------|---------------------------|---------------|
| Grandine/G.P #34 | Marginal | Suitable | Marginal | ** | Suitable | Suitable | Unsuitable | Unsuitable |
| Haiday-1 | ** | ** | ** | ** | ** | ** | ** | ** |
| Haiday-2 #6 | Unsuitable | Unsuitable | Unsuitable | ** | Suitable | Suitable | Unsuitable | Suitable |
| Holbrook Burn #13 | Unsuitable | Unsuitable | Marginal | ** | Suitable | Suitable | Unsuitable | Unsuitable |
| Meadowbrook Divide #15 | Unsuitable | Unsuitable | Suitable | ** | Suitable | Suitable | Marginal | Marginal |
| N. Black Pine #21 | Marginal | Suitable | Suitable | ** | Suitable | Suitable | Unsuitable | Unsuitable |
| N. Brush | ** | ** | ** | ** | ** | ** | ** | ** |
| N. Bowen #12 | Unsuitable | Unsuitable | Unsuitable | ** | Marginal | Suitable | Suitable | Suitable |
| North Canyon #14 | Unsuitable | Unsuitable | Unsuitable | ** | Suitable | Suitable | Suitable | Marginal |
| N. Mills #17 | Unsuitable | Unsuitable | Unsuitable | ** | Suitable | Suitable | Unsuitable | Unsuitable |
| Pipeline #25 | Marginal | Suitable | Marginal | ** | Suitable | Suitable | Unsuitable | Unsuitable |
| Roe #30 | Marginal | Suitable | Suitable | ** | Suitable | Suitable | Unsuitable | Unsuitable |
| Section 24 | ** | ** | ** | ** | ** | ** | ** | ** |
| S. Black Pine #8 | Marginal | Suitable | Suitable | ** | Suitable | Unsuitable | Suitable | Suitable |
| S. Brush | ** | ** | ** | ** | ** | ** | ** | ** |
| S. Bowen #33 | Unsuitable | Unsuitable | Unsuitable | ** | Suitable | Suitable | Unsuitable | Unsuitable |
| S. Mills #18 | Marginal | Suitable | Marginal | ** | Suitable | Suitable | Unsuitable | Unsuitable |
| Stone #29 | Unsuitable | Unsuitable | Unsuitable | ** | Suitable | Suitable | Unsuitable | Unsuitable |
| Trail Canyon #7 | Marginal | Suitable | Suitable | ** | Suitable | Suitable | Unsuitable | Unsuitable |
| Van Koman #16 | Unsuitable | Unsuitable | Unsuitable | ** | Suitable | Suitable | Unsuitable | Unsuitable |
| W. Black Pine #22 | Unsuitable | Unsuitable | Unsuitable | ** | Suitable | Suitable | Marginal | Marginal |
| W. Cedar Hill | ** | ** | ** | ** | ** | ** | ** | ** |
| W. Stocker #19 | Unsuitable | Unsuitable | Suitable | ** | Suitable | Suitable | Unsuitable | Unsuitable |
| Wight #5 | Suitable | Suitable | Marginal | ** | Suitable | Marginal | Unsuitable | Suitable |

** depicts sites where data is not available.

One of the twenty-one sites that were resampled in 2012 was suitable sage grouse breeding habitat. Six were marginal and fourteen were unsuitable. Table E-5 below summarizes the results of the 2011 sage grouse habitat surveys.

Table E-5:2012 Sage Grouse Breeding Habitat assessment by pasture.

| Pasture Name/ Plot # (2000 Plot #) | Overall Rating for Breeding Habitat | Average Sagebrush Canopy Cover | Average Sagebrush Height | Sagebrush Growth Form | Average Herbaceous Grass and Forb Height | Average Grass Canopy Cover | Average Forb Canopy Cover | Forb Richness |
|---------------------------------------|--|---|--------------------------------|-----------------------------|---|-------------------------------------|------------------------------------|------------------|
| Antelope #9 (2000 #9) | Unsuitable | Unsuitable | Suitable | Marginal | Marginal | Suitable | Unsuitable | Unsuitable |
| Bowhuis #7 (2000 #20) | Unsuitable | Marginal | Suitable | Unsuitable | Unsuitable | Suitable | Unsuitable | Unsuitable |
| Cove | ** | ** | ** | ** | ** | ** | ** | ** |
| Cove Burn #16 (2000 #28) | Unsuitable | Unsuitable | Suitable | Suitable | Unsuitable | Suitable | Marginal | Suitable |
| Cow Hollow #17 (2000 #11) | Unsuitable | Unsuitable | Unsuitable | NA | Marginal | Suitable | Marginal | Marginal |
| Crazy Canyon #1 | Suitable | Suitable | Marginal | Suitable | Suitable | Suitable | Suitable | Suitable |
| Crazy Canyon #3 (2000 #3,4) | Unsuitable | Unsuitable | Unsuitable | NA | Marginal | Suitable | Suitable | Suitable |
| E. Black Pine | ** | ** | ** | ** | ** | ** | ** | ** |
| E. Cedar Hill #22 (2000 #32) | Marginal | Marginal | Marginal | Suitable | Suitable | Suitable | Marginal | Suitable |
| E. Stateline #14 (2000 #23) | Unsuitable | Unsuitable | Marginal | Marginal | Marginal | Suitable | Unsuitable | Unsuitable |
| E. Stocker | ** | ** | ** | ** | ** | ** | ** | ** |
| Glen Canyon #21 (2000 #1) | Marginal | Suitable | Marginal | Unsuitable | Marginal | Suitable | Marginal | Marginal |
| Grandine/GP | ** | ** | ** | ** | ** | ** | ** | ** |
| Haliday-1 | ** | ** | ** | ** | ** | ** | ** | ** |
| Haliday-2 #4 (2000 #6) | Unsuitable | Unsuitable | Unsuitable | NA | Unsuitable | Suitable | Suitable | Marginal |
| Holbrook Burn | ** | ** | ** | ** | ** | ** | ** | ** |
| Meadowbrook Divide | ** | ** | ** | ** | ** | ** | ** | ** |
| N. Black Pine #8 (2000 #21) | Unsuitable | Marginal | Suitable | Unsuitable | Unsuitable | Suitable | Unsuitable | Unsuitable |
| N. Brush | ** | ** | ** | ** | ** | ** | ** | ** |
| N. Bowen #18 (2000 #12) | Unsuitable | Unsuitable | Unsuitable | NA | Marginal | Suitable | Unsuitable | Marginal |
| North Canyon #20 (2000 #14) | Unsuitable | Unsuitable | Unsuitable | NA | Suitable | Suitable | Suitable | Suitable |
| N. Mills #11 (2000 #17) | Unsuitable | Unsuitable | Unsuitable | NA | Marginal | Suitable | Unsuitable | Marginal |
| Pipeline #12 (2000 #25) | Marginal | Marginal | Marginal | Marginal | Marginal | Suitable | Unsuitable | Unsuitable |
| Roe #15 (2000 #30) | Marginal | Suitable | Suitable | Unsuitable | Marginal | Suitable | Unsuitable | Unsuitable |
| Section 24 | ** | ** | ** | ** | ** | ** | ** | ** |
| S. Black Pine | ** | ** | ** | ** | ** | ** | ** | ** |
| S. Brush * | ** | ** | ** | ** | ** | ** | ** | ** |
| S. Bowen | ** | ** | ** | ** | ** | ** | ** | ** |
| S. Mills #5 (2000 #18) | Marginal | Marginal | Suitable | Unsuitable | Marginal | Suitable | Unsuitable | Marginal |
| Stone | ** | ** | ** | ** | ** | ** | ** | ** |
| Trail Canyon #19 (2000 #7) | Unsuitable | Unsuitable | Marginal | Marginal | Marginal | Suitable | Suitable | Suitable |
| Van Koman #13 (2000 #16) | Unsuitable | Unsuitable | Unsuitable | NA | Marginal | Suitable | Unsuitable | Marginal |
| W. Black Pine #10 (2000 #22) | Unsuitable | Unsuitable | Unsuitable | NA | Unsuitable | Suitable | Unsuitable | Marginal |
| W. Cedar Hill | ** | ** | ** | ** | ** | ** | ** | ** |

| Pasture Name/ Plot # (2000 Plot #) | Overall Rating for Breeding Habitat | Average Sagebrush Canopy Cover | Average Sagebrush Height | Sagebrush Growth Form | Average Herbaceous Grass and Forb Height | Average Grass Canopy Cover | Average Forb Canopy Cover | Forb Richness |
|---------------------------------------|--|---|--------------------------------|-----------------------------|---|-------------------------------------|------------------------------------|------------------|
| W. Stocker #6 (2000 #19) | Unsuitable | Unsuitable | Suitable | Marginal | Marginal | Suitable | Marginal | Suitable |
| Wight #2 (2000 #5) | Marginal | Marginal | Suitable | Marginal | Unsuitable | Suitable | Unsuitable | Suitable |

** depicts sites where data is not available.

2012 Sage Grouse Habitat Assessment Photos



Antelope Pasture 7/2/2012



North Black Pine Pasture 6/29/2012



Bowhuis Pasture 6/29/2012





East Cedar Hill Pasture 7/12/2012



West Black Pine Pasture 7/02/2012



Cove Burn Pasture 7/10/2012





Cow Hollow Pasture 7/10/2012



Crazy Canyon Pasture 6/27/2012



Crazy Canyon Pasture 6/28/2012





Glen Canyon Pasture 7/12/2012



Haliday-2 Pasture 6/28/2012



South Mills Pasture 6/29/2012





North Canyon North 1/2 Pasture 7/4/2012



North Bowen Pasture 7/11/2012



North Mills Pasture 7/5/2012





Pipeline Pasture 7/5/2012



Roe Pasture 7/10/2012



East Stateline Pasture 7/9/2012



West Stocker Pasture 6/29/2012



Trail Canyon Pasture 7/11/2012



Van Koman Pasture 7/9/2012





Wight Pasture 6/28/2012

- C. SWCA Environmental Consultants. 2012. Habitat Equivalency for Mitigation of the Gateway West Transmission Line. Prepared as a component of the Framework for Sage-grouse Impacts Analysis developed by Bureau of Land Management; U.S. Fish and Wildlife Service; Wyoming Game and Fish Department; Idaho Department of Fish and Game; Rocky Mountain Power; Idaho Power Company. SWCA Environmental Consultants, 295 Interlocken Boulevard, Suite 300, Broomfield, Colorado, 80021.
- D. Sage-Grouse National Technical Team. 2011. A Report on National Greater Sage-Grouse Conservation Measures. U.S. Bureau of Land Management, Washington, D.C.

Process Steps

1. Assessment area is Curlew Sage-Grouse local working group planning area (CPA). Area is 2,248 km² (555,465 GIS_Acres).
2. Goal was to fill out 1. Seasonal Habitat Availability; 2. Seasonal Use Area Connectivity; and 3. Anthropogenic Features from *Form G: 3rd Order (Fine-Scale) Sage-Grouse Habitat Description* (page III-6 from reference B).
3. Determine criteria for Sage-Grouse Seasonal Habitats

Using reference A and B and personal communication with Idaho BLM State wildlife biologist Paul Makela, and BLM Pocatello Field Office wildlife biologist James Kumm, the following data was used for seasonal habitats in the CPA:

 - a. Occupied Breeding Habitat
 - i. Data Sources
 - Use sage-grouse Preliminary Priority Habitat (PPH) v.2 data for areas with adequate sagebrush canopy cover and understory.
 - Use IDF&G lek data because distance from lek is important criteria in determining breeding habitat. Curlew area population is non-migratory, so 5 km buffer distance used. There is some habitat fragmentation in the area. Used leks with Status = Active.
 - Use Fire History data to remove areas within fire perimeters from 2002-2011 (ten years). This time frame used because it captures majors fires in recent years and assumes limited post-fire shrub regeneration.
 - Use roads data to remove buffered major roads. Buffer distances area from reference C, Table A.1 for 0 (zero) quality habitat (100m for Interstates; 25m for county/state highway or heavily traveled gravel roads).
 - Use Pocatello RMP vegetation data (modified GAP data from the old Upper Snake District Fire Management Direction Amendment (FMDA)) to remove non-habitat (agricultural lands, etc...).
 - ii. Geoprocessing
 - CLIP PPH v.2 and IDF&G lek data (Status = Active) to CPA
 - BUFFER leks 5 km with Dissolve all option
 - UNION clipped PPH v.2 and buffered lek data (BreedResult1)
 - DISSOLVE BreedResult1 (BreedResult2)
 - ERASE fire perimeters 2002-2011 from BreedResult2 (BreedResult3)
 - ERASE buffered major roads from BreedResult3 (BreedResult4)
 - ERASE non-habitat (ag lands, etc...) from BreedResult4 (BreedResult5)
 - RENAME BreedResult5 to **PocFO_Curlew_BreedingHab_Result** = FINAL CPA BREEDING HABITAT.
 - b. Occupied Summer Habitat
 - i. Data Sources

- Use Inter-Mountain Basins Montane Sagebrush Steppe (Value 71) from 2005 SageMap data to represent sage-grouse summer habitat. The key is succulent forbs and mountain shrub communities.
- ii. Geoprocessing
 - EXTRACT BY MASK 2005 SageMap data to the CPA boundary (SummerResult1).
 - EXTRACT BY ATTRIBUTES Value 71 from SummerResult1 (SummerResult2).
 - Convert RASTER TO POLYGON SummerResult2 (SummerResult3).
 - ERASE fire perimeters 2002-2011 from SummerResult3 (SummerResult4)
 - ERASE buffered major roads from SummerResult4 (SummerResult5)
 - ERASE non-habitat (ag lands, etc...) from SummerResult5 (SummerResult6)
 - RENAME SummerResult6 to **PocFO_Curlew_SummerHab_Result** = FINAL CPA SUMMER HABITAT.
- c. Occupied Fall/Winter Habitat
 - i. Data Sources
 - Use sage-grouse winter habitat data used for the Pocatello RMP to represent fall/winter sage-grouse habitat. This polygon dataset is based on radio-collared grouse located during a March 2004 aerial survey conducted under contract by the IDF&G. The key is sagebrush availability above snow.
 - ii. Geoprocessing
 - CLIP Pocatello RMP sage-grouse winter habitat to the CPA (WinterResult1)
 - ERASE fire perimeters 2002-2011 from WinterResult1 (WinterResult2)
 - ERASE buffered major roads from WinterResult2 (WinterResult3)
 - ERASE non-habitat (ag lands, etc...) from WinterResult3 (WinterResult4)
 - RENAME WinterResult4 to **PocFO_Curlew_WinterHab_Result** = FINAL CPA WINTER HABITAT.
 - d. Potential Breeding Habitat
 - i. Data Sources
 - Use area of BreedResult2 (breeding habitat prior to removal of fires, buffered roads, and non-habitat) that were burned during 2002-2011 fires. Remove buffered roads and other non-habitat. This should represent areas of potential breeding habitat once sagebrush community vegetation returns.
 - ii. Geoprocessing
 - INTERSECT BreedResult2 with Pocatello Field Office fire perimeters 2002-2011 (PotentialBreedingResult1)
 - ERASE buffered major roads from PotentialBreedingResult1 (PotentialBreedingResult2)
 - ERASE non-habitat (ag lands, etc...) from PotentialBreedingResult2 (PotentialBreedingResult3)
 - RENAME PotentialBreedingResult3 to **PocFO_Curlew_Potential_BreedingHab_Result** = FINAL CPA POTENTIAL BREEDING HABITAT.
 - e. Potential Summer Habitat
 - i. Data Sources
 - Use area of SummerResult3 (mountain shrub summer habitat prior to removal of fires, buffered roads, and non-habitat) that were burned during 2002-2011 fires. Remove buffered roads and other non-habitat. This should represent

areas of potential summer habitat once mountain shrub community vegetation returns.

ii. Geoprocessing

- INTERSECT SummerResult3 with Pocatello Field Office fire perimeters 2002-2011 (PotentialSummerResult1)
- ERASE buffered major roads from PotentialSummerResult1 (PotentialSummerResult2)
- ERASE non-habitat (ag lands, etc...) from PotentialSummerResult2 (PotentialSummerResult3)
- RENAME PotentialSummerResult3 to **PocFO_Curlew_Potential_SummerHab_Result** = FINAL CPA POTENTIAL SUMMER HABITAT.

f. Potential Winter Habitat

i. Data Sources

- Use area of WinterResult1 (winter habitat prior to removal of fires, buffered roads, and non-habitat) that were burned during 2002-2011 fires. Remove buffered roads and other non-habitat. This should represent areas of potential winter habitat once sagebrush community vegetation returns.

ii. Geoprocessing

- INTERSECT WinterResult1 with Pocatello Field Office fire perimeters 2002-2011 (PotentialWinterResult1)
- ERASE buffered major roads from PotentialWinterResult1 (PotentialWinterResult2)
- ERASE non-habitat (ag lands, etc...) from PotentialWinterResult2 (PotentialWinterResult3)
- RENAME PotentialWinterResult3 to **PocFO_Curlew_Potential_WinterHab_Result** = FINAL CPA POTENTIAL WINTER HABITAT.

g. Habitat Connectivity

i. Discussion

- Reference B (Stivers, et al. 2010) describes 3rd Order habitat connectivity (for Form G) on page II-21. The key is that habitat with “contiguous shrub cover between seasonal use areas” is more suitable than those without.
- The 2005 SageMap data has two other classified habitats within the CPA, Inter-Mountain Basins Big Sagebrush Shrubland (Value 54) and Inter-Mountain Basins Big Sagebrush Steppe (Value 78). In the GIS, this other shrubland was evaluated for possibly providing continuity among the Breeding, Summer, and Winter sage-grouse habitats. However, after removing the 2002-2011 fire perimeters, the buffered roads, and the non-habitat vegetation (agricultural lands, etc...), from these other two classifications, there was basically nothing left that was not already within a seasonal habitat.
- In the end, to evaluate seasonal habitat connectivity, a quick map was produced in ArcMap, displaying all of the seasonal habitats at the same time. When this was done, it showed the areas where connectivity was obvious and not so obvious. This allowed the Pocatello FO wildlife biologist to complete the connectivity discussion on Form G.

h. Anthropogenic Influences

i. Discussion

- There is a place to report densities of anthropogenic line and point features on Form G. Reference D recommends that “discrete anthropogenic disturbances cover less than 3% of the total sage-grouse habitat regardless of ownership.” Anthropogenic influences include but are not limited to features such as “roads, transmission lines, substations, wind turbines, oil and gas wells, geothermal wells and associated facilities, pipelines, landfills, homes, and mines.”
- Reference D also recommends measuring anthropogenic features using two spatial extents: “1) the area contained within individual priority areas and 2) each one-mile section within the priority area.” This particular analysis DID NOT conform to these recommendations. First, except for major roads and transmission lines, immediately available data was for BLM-managed land only. Second, we initially wanted only a quick, rough idea of some anthropogenic influences in the CPA. There are a few mineral material sites within the CPA, but no communication sites, wind turbines, oil/gas leases, or geothermal sites on BLM-managed land. There may be small wind turbines, geothermal sites, or communication sites on other surface management status lands.
- For this analysis, quick density calculations were completed for major roads and transmission line/km² and range improvement points/km² within the CPA. A spreadsheet of range improvement point densities broken down by feature type (POINT_FEAT) was also prepared.

Based on the mapping of breeding, summer and winter habitat, six HAF study sites did not fall within any habitat category; Cove Burn Pasture #343 and #649, North Canyon Pasture #598, Roe Pasture #010, Stone Pasture #459, and West Black Pine Pasture #102.

Figure E-7: Map of both occupied and potential Breeding Habitat and HAF Site IDs.

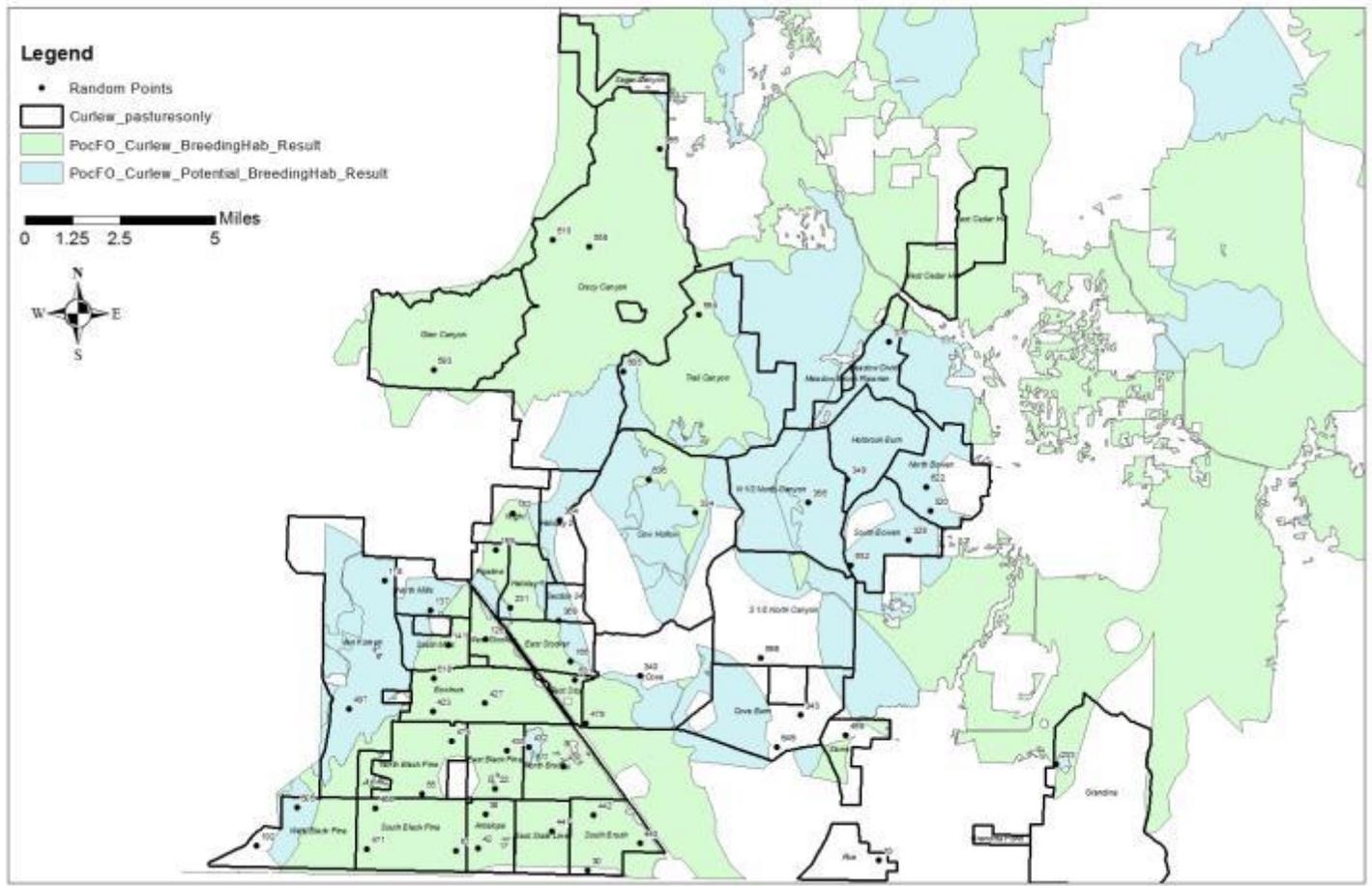


Table E-6:2013 Sage Grouse Breeding Habitat assessment by pasture.

| Pasture Name/ Site ID | Overall Rating for Breeding Habitat | Average Sagebrush Canopy Cover | Average Sagebrush Height | Sagebrush Growth Form | Average Herbaceous Grass and Forb Height | Average Grass Canopy Cover | Average Forb Canopy Cover | Forb Richness |
|-----------------------------|--|---|--------------------------------|-----------------------------|---|-------------------------------------|------------------------------------|------------------|
| Antelope #038 | Unsuitable | Unsuitable | Unsuitable | NA | Unsuitable | Unsuitable | Unsuitable | Unsuitable |
| Antelope #042 | Unsuitable | Unsuitable | Marginal | Suitable | Unsuitable | Unsuitable | Unsuitable | Marginal |
| Bowhuis #423 | Marginal | Marginal | Suitable | Marginal | Suitable | Suitable | Unsuitable | Unsuitable |
| Bowhuis #427 | Unsuitable | Unsuitable | Marginal | Marginal | Suitable | Suitable | Unsuitable | Unsuitable |
| Bowhuis #518 | Marginal | Marginal | Marginal | Suitable | Suitable | Marginal | Unsuitable | Suitable |
| Cove #340 | Unsuitable | Unsuitable | Unsuitable | NA | Suitable | Suitable | Suitable | Suitable |
| Cove #479 | Unsuitable | Unsuitable | Unsuitable | Unsuitable | Suitable | Suitable | Unsuitable | Marginal |
| Cow Hollow #334 | Marginal | Marginal | Marginal | Suitable | Suitable | Suitable | Unsuitable | Suitable |
| Cow Hollow #636 | Unsuitable | Unsuitable | Unsuitable | NA | Suitable | Suitable | Marginal | Suitable |
| Crazy Canyon #395 | Unsuitable | Unsuitable | Suitable | Suitable | Suitable | Suitable | Suitable | Suitable |
| Crazy Canyon #558 | Marginal | Marginal | Suitable | Suitable | Marginal | Suitable | Suitable | Suitable |
| Crazy Canyon #610 | Marginal | Marginal | Marginal | Suitable | Suitable | Marginal | Suitable | Suitable |

| Pasture Name/ Site ID | Overall Rating for Breeding Habitat | Average Sagebrush Canopy Cover | Average Sagebrush Height | Sagebrush Growth Form | Average Herbaceous Grass and Forb Height | Average Grass Canopy Cover | Average Forb Canopy Cover | Forb Richness |
|----------------------------|--|---|--------------------------------|-----------------------------|---|-------------------------------------|------------------------------------|------------------|
| E. Black Pine #022 | Marginal | Marginal | Suitable | Suitable | Suitable | Unsuitable | Unsuitable | Unsuitable |
| E. Black Pine #435 | Unsuitable | Unsuitable | Unsuitable | NA | Suitable | Suitable | Unsuitable | Unsuitable |
| E. Cedar Hill | ** | ** | ** | ** | ** | ** | ** | ** |
| E. Stateline #447 | Unsuitable | Unsuitable | Unsuitable | NA | Marginal | Suitable | Unsuitable | Marginal |
| E. Stocker #166 | Marginal | Marginal | Suitable | ** | Suitable | Suitable | Unsuitable | Unsuitable |
| Glen Canyon #593 | Unsuitable | Unsuitable | Suitable | Suitable | Suitable | Marginal | Unsuitable | Suitable |
| Grandine/GP #233 | Suitable | Suitable | Marginal | Suitable | Suitable | Suitable | Unsuitable | Suitable |
| Holiday-1 #231 | Marginal | Marginal | Suitable | Suitable | Suitable | Suitable | Unsuitable | Suitable |
| Holiday-2 #364 | Unsuitable | Unsuitable | Unsuitable | NA | Suitable | Suitable | Marginal | Suitable |
| Holbrook Burn #349 | Unsuitable | Unsuitable | Unsuitable | Suitable | Suitable | Suitable | Suitable | Suitable |
| Meadowbrook Divide #316 | Unsuitable | Unsuitable | Suitable | Unsuitable | Marginal | Suitable | Suitable | Suitable |
| N. Black Pine #055 | Marginal | Marginal | Suitable | Suitable | Marginal | Suitable | Unsuitable | Unsuitable |
| N. Black Pine #474 | Marginal | Marginal | Suitable | Unsuitable | Unsuitable | Suitable | Unsuitable | Unsuitable |
| N. Brush 430 | Marginal | Suitable | Marginal | Suitable | Unsuitable | Suitable | Unsuitable | Unsuitable |
| N. Brush 432 | Unsuitable | Unsuitable | Unsuitable | NA | Unsuitable | Marginal | Unsuitable | Marginal |
| N. Bowen #320 | Unsuitable | Unsuitable | Unsuitable | NA | Suitable | Suitable | Unsuitable | Marginal |
| N. Bowen #622 | Unsuitable | Unsuitable | Unsuitable | NA | Suitable | Suitable | Suitable | Suitable |
| North Canyon #356 | Unsuitable | Unsuitable | Unsuitable | NA | Suitable | Suitable | Suitable | Suitable |
| N. Mills #137 | Unsuitable | Unsuitable | Unsuitable | NA | Suitable | Suitable | Unsuitable | Suitable |
| Pipeline #159 | Suitable | Suitable | Suitable | Suitable | Suitable | Suitable | Unsuitable | Suitable |
| Rest Stop #531 | Unsuitable | Unsuitable | Unsuitable | NA | Suitable | Suitable | Suitable | Suitable |
| Section 24 #369 | Unsuitable | Unsuitable | Unsuitable | NA | Suitable | Suitable | Unsuitable | Suitable |
| S. Black Pine #051 | Unsuitable | Unsuitable | Suitable | Suitable | Unsuitable | Unsuitable | Unsuitable | Unsuitable |
| S. Black Pine #466 | Unsuitable | Unsuitable | Suitable | Suitable | Suitable | Suitable | Unsuitable | Unsuitable |
| S. Black Pine #471 | Unsuitable | Unsuitable | Unsuitable | NA | Suitable | Suitable | Unsuitable | Unsuitable |
| S. Brush #030 | Marginal | Marginal | Suitable | Suitable | Marginal | Suitable | Unsuitable | Unsuitable |
| S. Brush #440 | Marginal | Suitable | Marginal | Suitable | Marginal | Marginal | Unsuitable | Unsuitable |
| S. Brush #442 | Marginal | Suitable | Marginal | Suitable | Marginal | Suitable | Unsuitable | Suitable |
| S. Bowen #328 | Unsuitable | Unsuitable | Unsuitable | NA | Suitable | Suitable | Unsuitable | Marginal |
| S. Bowen #632 | Unsuitable | Unsuitable | Unsuitable | NA | Unsuitable | Suitable | Unsuitable | Suitable |

| Pasture Name/ Site ID | Overall Rating for Breeding Habitat | Average Sagebrush Canopy Cover | Average Sagebrush Height | Sagebrush Growth Form | Average Herbaceous Grass and Forb Height | Average Grass Canopy Cover | Average Forb Canopy Cover | Forb Richness |
|------------------------------|--|---|--------------------------------|-----------------------------|---|-------------------------------------|------------------------------------|------------------|
| S. Mills #141 | Marginal | Marginal | Marginal | Suitable | Suitable | Suitable | Unsuitable | Unsuitable |
| Stone #459 | Unsuitable | Unsuitable | Unsuitable | NA | Suitable | Suitable | Unsuitable | Unsuitable |
| Trail Canyon #554 | Marginal | Marginal | Suitable | Suitable | Suitable | Suitable | Suitable | Suitable |
| Trail Canyon #605 | Unsuitable | Unsuitable | Marginal | Unsuitable | Suitable | Suitable | Suitable | Suitable |
| Van Koman #118 | Unsuitable | Unsuitable | Unsuitable | NA | Suitable | Suitable | Unsuitable | Unsuitable |
| Van Koman #497 | Unsuitable | Unsuitable | Unsuitable | NA | Suitable | Suitable | Unsuitable | Suitable |
| W. Black Pine #505 | Unsuitable | Unsuitable | Unsuitable | NA | Marginal | Suitable | Suitable | Suitable |
| W. Cedar Hill | ** | ** | ** | ** | ** | ** | ** | ** |
| W. Stocker #126 | Marginal | Marginal | Marginal | Suitable | Marginal | Marginal | Unsuitable | Unsuitable |
| Wight #182 | Suitable | Suitable | Marginal | Suitable | Suitable | Suitable | Unsuitable | Marginal |

** depicts sites where data is not available.

Figure E-8: Map of both occupied and potential Summer Habitat and HAF Site IDs.

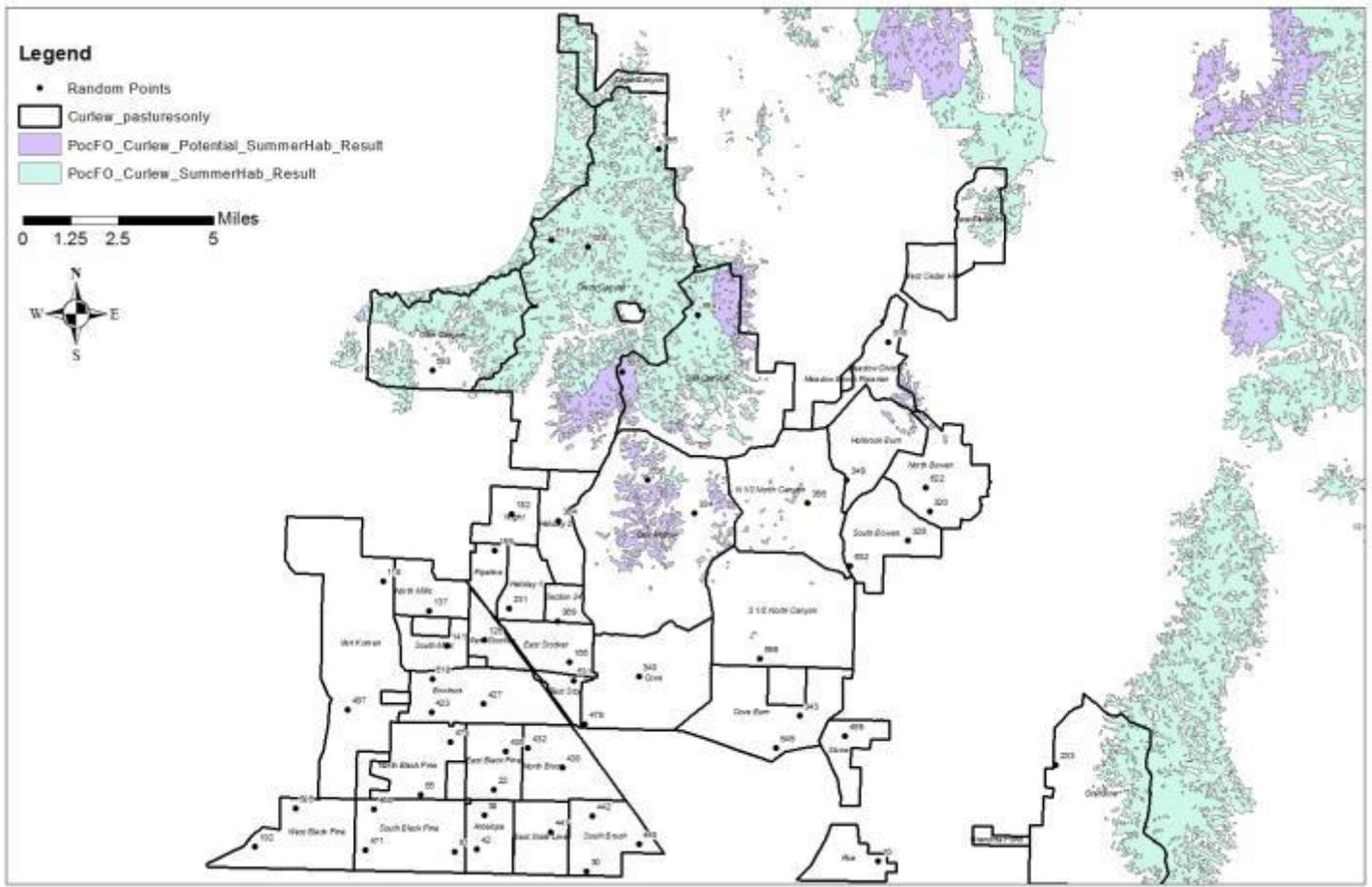


Table E-7: Upland Summer Habitat Indicators and Assessment Values.

| Habitat Indicator | Suitable | Marginal | Unsuitable |
|--|---|---|--------------------------|
| Sagebrush Canopy Cover (mean) | 10-25% | 5 to < 10% or > 25% | <5% |
| Sagebrush Height (mean) | 40 to 80 cm | 20 to <40 cm or >80 cm | < 20 cm |
| Perennial Grass and Forb Canopy Cover (mean) | ≥ 15% | 5 to < 15 % | <5 % |
| Preferred Forb Availability (relative to site potential) | Forbs are common with several preferred species present | Forbs are common but only a few preferred species are present | Preferred forbs are rare |

Table E-8: 2013 Sage Grouse Summer Habitat assessment by pasture.

| Pasture Name/ Site ID | Overall Rating for Summer Habitat | Average Sagebrush Canopy Cover | Average Sagebrush Height | Average Perennial Grass and Forb Cover | Forb Richness |
|-----------------------|-----------------------------------|--------------------------------|--------------------------|--|---------------|
| Cow Hollow #636 | Unsuitable | Unsuitable | Unsuitable | Suitable | Suitable |
| Crazy Canyon #395 | Unsuitable | Unsuitable | Suitable | Suitable | Suitable |
| Crazy Canyon #558 | Marginal | Marginal | Marginal | Suitable | Suitable |
| Crazy Canyon #610 | Suitable | Suitable | Marginal | Suitable | Suitable |
| Trail Canyon #554 | Marginal | Marginal | Suitable | Suitable | Suitable |
| Trail Canyon #605 | Unsuitable | Unsuitable | Marginal | Suitable | Suitable |

Figure E-9: Map of both occupied and potential Winter Habitat and HAF Site IDs.

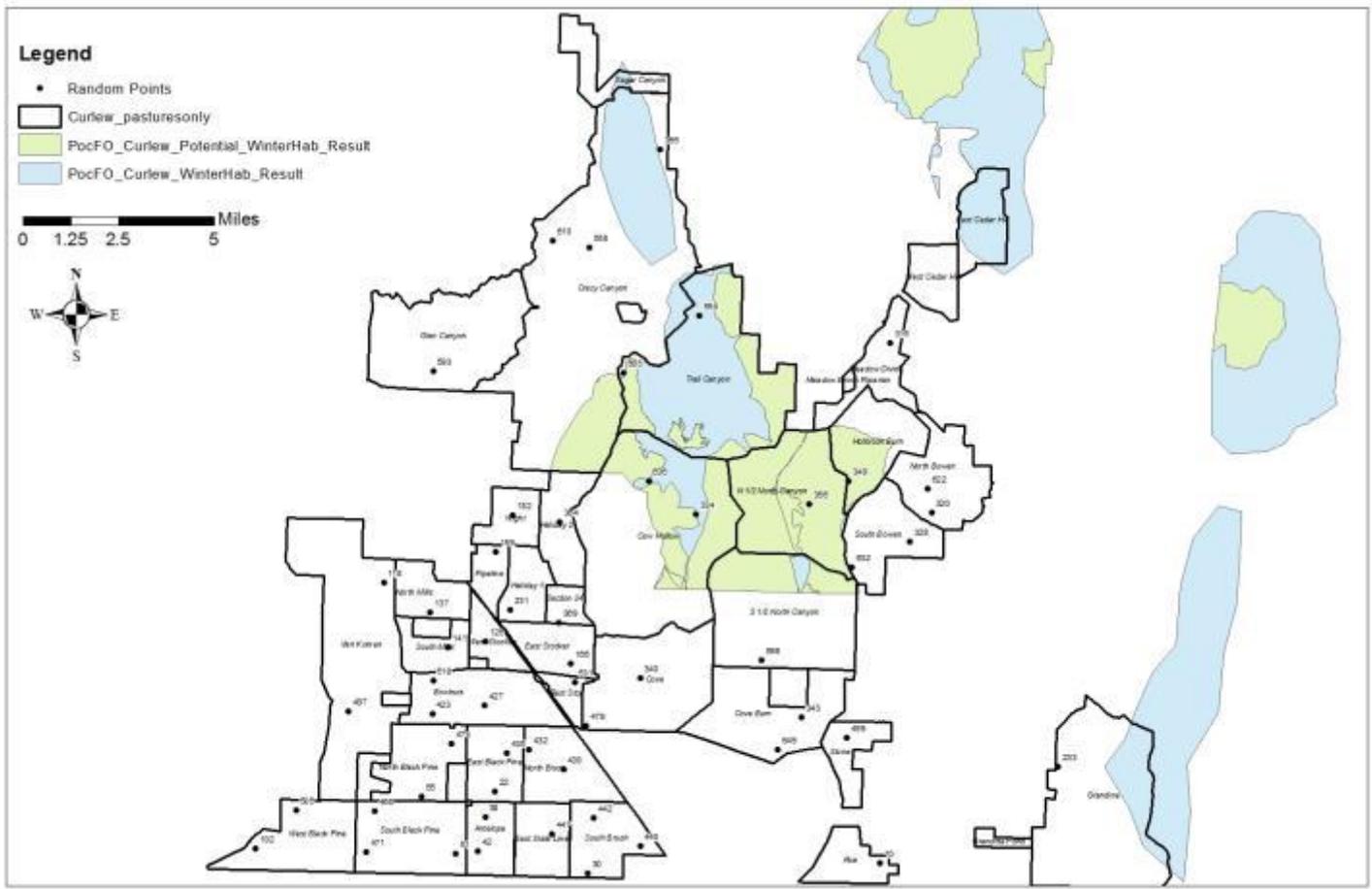


Table E-9: Winter Habitat Indicators and Assessment Values.

| Habitat Indicator | Suitable | Marginal | Unsuitable |
|------------------------------------|----------|---------------|------------|
| Sagebrush Canopy Cover (mean) | ≥ 10% | 5 to < 10% | <5% |
| Sagebrush Height above Snow (mean) | >25 cm | >10 to < 25cm | < 10 cm |

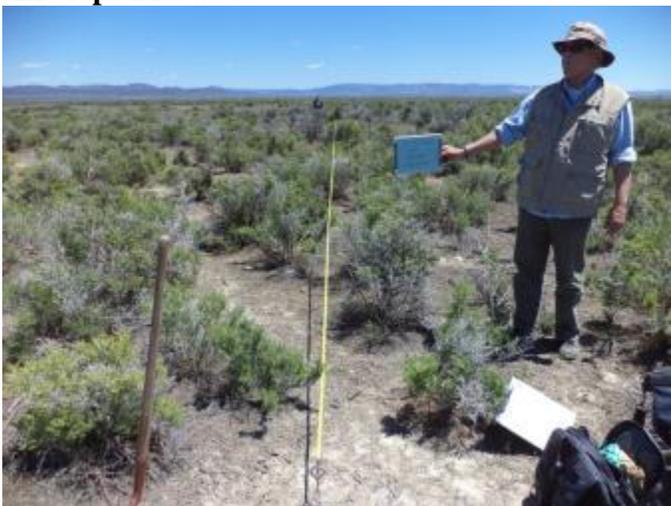
Table E-10: 2013 Sage Grouse Winter Habitat assessment by pasture.

| Pasture Name/ Site ID | Overall Rating for Winter Habitat | Average Sagebrush Canopy Cover | Average Sagebrush Height |
|-----------------------|-----------------------------------|--------------------------------|--------------------------|
| Cow Hollow #334 | Marginal | Marginal | Suitable |
| Cow Hollow #636 | Unsuitable | Unsuitable | Unsuitable |
| Crazy Canyon #395 | Unsuitable | Unsuitable | Suitable |
| Holbrook Burn #349 | Unsuitable | Unsuitable | Suitable |
| North Canyon #356 | Unsuitable | Unsuitable | Unsuitable |
| Trail Canyon #554 | Marginal | Marginal | Suitable |
| Trail Canyon #605 | Unsuitable | Unsuitable | Suitable |

2013 Sage Grouse Habitat Assessment And Land Health Assessment Photos



Antelope Plot #038



Antelope Plot #042





Bowhuis Plot #423



Bowhuis Plot #427



Bowhuis Plot #518



Cove Plot #340



Cove Plot #479



Cove Burn Plot #343



Cove Burn Plot #649



Cove Burn Plot #649



Cow Hollow Plot #334



Cow Hollow Plot #636



Crazy Canyon Plot #395



Crazy Canyon Plot #558



Crazy Canyon Plot #610



East Black Pine Plot #022



East Black Pine Plot #435



East Stateline Plot #447



East Stocker Plot #166



Glen Canyon Plot #593



Grandine Plot #233



Haliday-1 Plot #231





Haliday-2 Plot #364

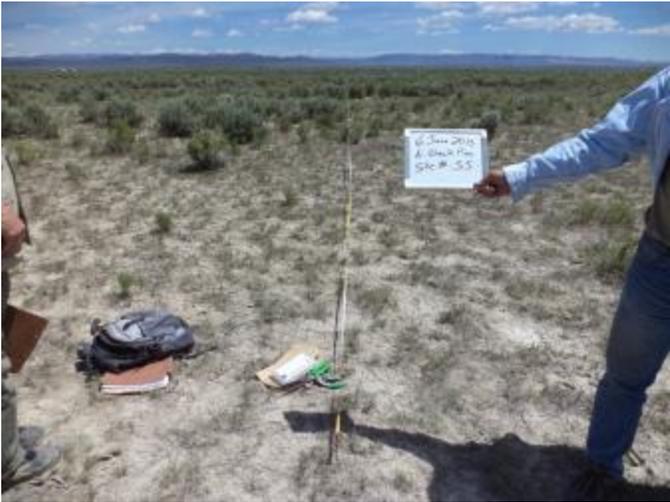


Holbrook Burn Plot #349

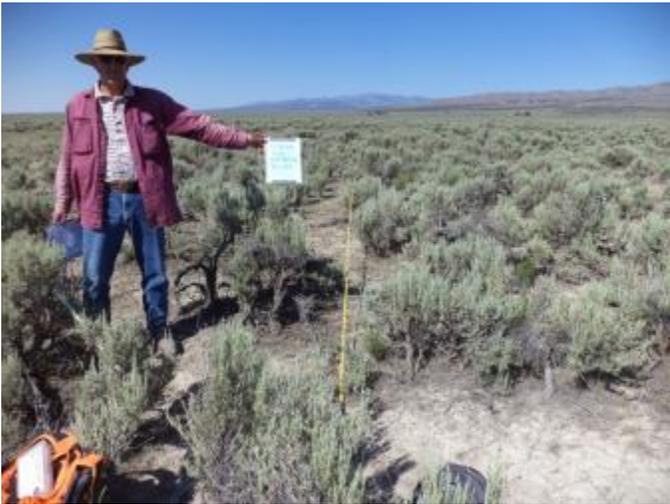


Meadowbrook Divide Plot #316





North Black Pine Plot #055



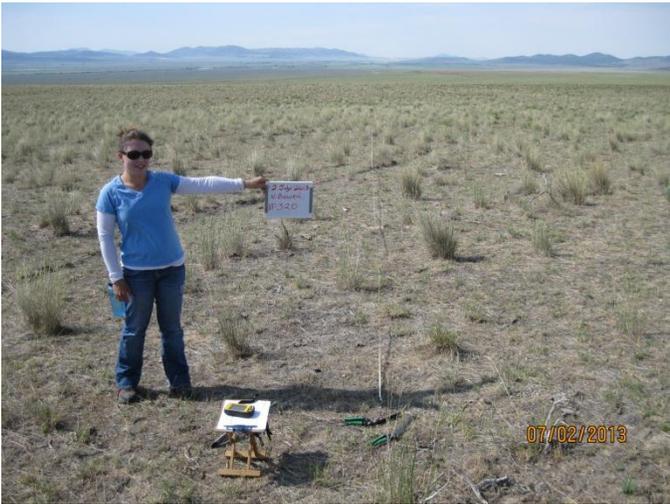
North Black Pine Plot #474



North Brush Plot #430



North Brush Plot #432



North Bowen Plot #320



North Bowen Plot #622



North Canyon North 1/2 Plot #356



North Canyon South 1/2 Plot #598



North Mills Plot #137



Pipeline Plot #159



Rest Stop Plot #531



Roe Plot #010



Section 24 Plot #369



South Black Pine Plot #051



South Black Pine Plot #466



South Black Pine Plot #442



South Bowen Plot #328



South Bowen Plot #632





South Brush Pasture Plot #30



South Brush Pasture Plot #440

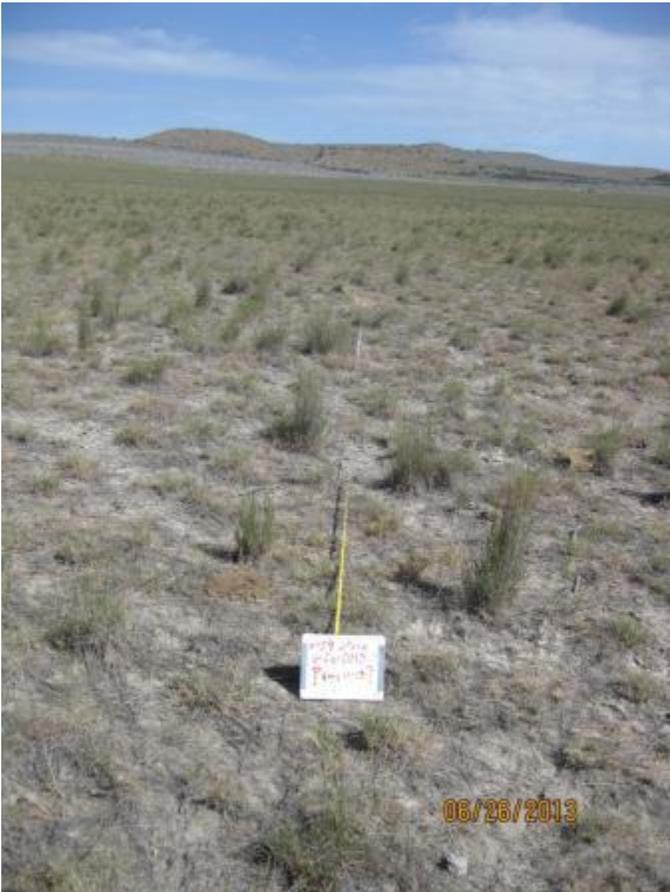


South Brush Plot #442





South Mills Plot #141



Stone Plot #459





Trail Canyon Plot #554



Trail Canyon Plot #605



Van Koman Plot #118





Van Koman Plot #497



West Black Pine Plot #102



West Black Pine Plot #505



West Stocker Plot #126

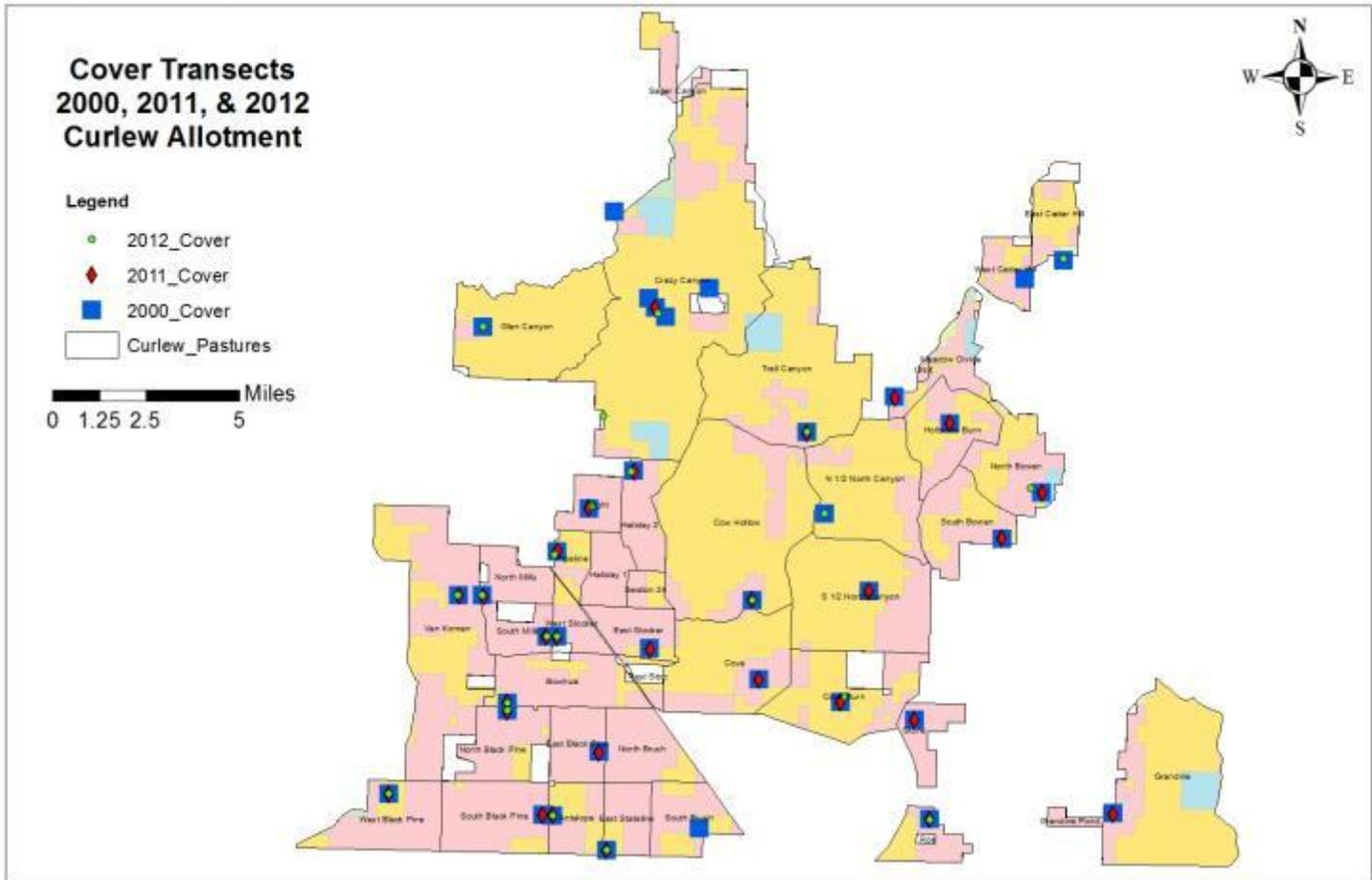


Wight Plot #182

APPENDIX F: COVER STUDIES associated with HAF Sites

2000, 2011, 2012 Cover Data

Figure F-1: Map of Cover Transect Locations for 2000, 2011 and 2012.



In 2000, species cover (%) and height (inches) were sampled at 35 sites on the Curlew allotment to characterize crested wheatgrass, perennial grasses (native grasses), bulbous bluegrass (*poa bulbosa*), cheatgrass (*bromus tectorum* and *bromus japonicus*), forbs, weeds (herbaceous), sagebrush, shrubs (native shrubs), persistent litter, non-persistent litter, rock, bare ground, and crust. In 2011, 28 of the 35 original sites were resampled and in 2012 21 of the original 35 sites were resampled plus 1 additional site in Crazy Canyon Pasture. The results of 2000, 2011, and 2012 surveys are compared below. Abbreviations used to name vegetative and ground surface components of cover (%) are listed in the following table.

Table F-1: Abbreviations used for vegetative cover and soil cover components

| | |
|-------------------|--|
| CWG | Crested wheatgrass (<i>Agropyron cristatum</i> , <i>A. desertorum</i>) |
| Per. GRASS | Native grasses, including Kentucky bluegrass (<i>Poa pratensis</i>) |
| POBU | Bulbous bluegrass (<i>P. bulbosa</i>) |
| BRTE/BRJA | Cheatgrass (<i>Bromus tectorum</i> , <i>B. japonicus</i>) |
| FORB | Native herbs, herbaceous broad-leafed plants |
| WEED | Weedy, undesirable herbaceous species, mostly annuals |
| ARTR | Sagebrush (<i>Artemisia tridentata</i> subspecies <i>vaseyana</i> & <i>wyomingensis</i>) |
| SHRUB | Native shrubs, e.g. bitterbrush, rabbitbrush, snowberry, serviceberry |
| PL | Persistent litter, e.g. woody debris, dead woody stems |
| NL | Non-persistent litter, e.g. dead herbaceous material, dried manure |
| RK | Surface composed of rock, stone, gravel, etc. |
| BG | Bare ground, e.g. soil surface |
| CRUST | Macrobiotic crust and moss |

The 2000 survey was performed during the summer growing season, between mid-June and the end of July, when plants were at their highest production and would have been easiest to identify. By contrast, the 2011 survey was performed in early November by which time forb identification was difficult, and some unknown portion of the dormant or senescent herbaceous forb material could have been lost. Therefore it is quite probable that the 2011 survey under-estimated the occurrence of forbs within the evaluation area. The 2012 survey was performed during the summer growing season, between late June and early August. Therefore, comparison between the 2000 and 2012 surveys may be more accurate. The percent cover was determined using the step point method. The survey conducted in 2000 recorded 200 points, the survey in 2011 recorded 100 points, and the survey conducted in 2012 again recorded 200 points. The original survey sites conducted in 2000 were not permanently marked; therefore direct comparison of the data is not possible. However, the surveys were conducted in the same general area (within the same Township, Range, Section, and ¼ Section).

The following tables report plant cover (%) in those pastures surveyed. Survey points that experienced at least one wildfire (f) between 1999 and 2011 are designated in the following table as an underlined name followed by (f); e.g. “Pasture Name (f)”.

Table F-2: List of Species Encountered Considered “Weeds” within the Cover Data for 2000, 2011, & 2012.

| Common Name | Scientific Name |
|---------------------|--------------------------------|
| Dandelion | <i>Taraxacum officinale</i> |
| Houndstongue | <i>Cynoglossum officinale</i> |
| Blue Mustard | <i>Chorispora tenella</i> |
| Tumble Mustard | <i>Sisymbrium altissimum</i> |
| Russian Thistle | <i>Salsola iberica</i> |
| Clasping Pepperweed | <i>Lepidium perfoliatum</i> |
| Bur Buttercup | <i>Ranunculus testiculatus</i> |
| Field Pennycress | <i>Thlaspi arvense</i> |
| Curlycup gumweed | <i>Grindelia squarrosa</i> |

Figure F-2: Map of Cover transects locations for 2000, 2011, and 2013. The Ecological Sites are depicted for the Native vegetation.

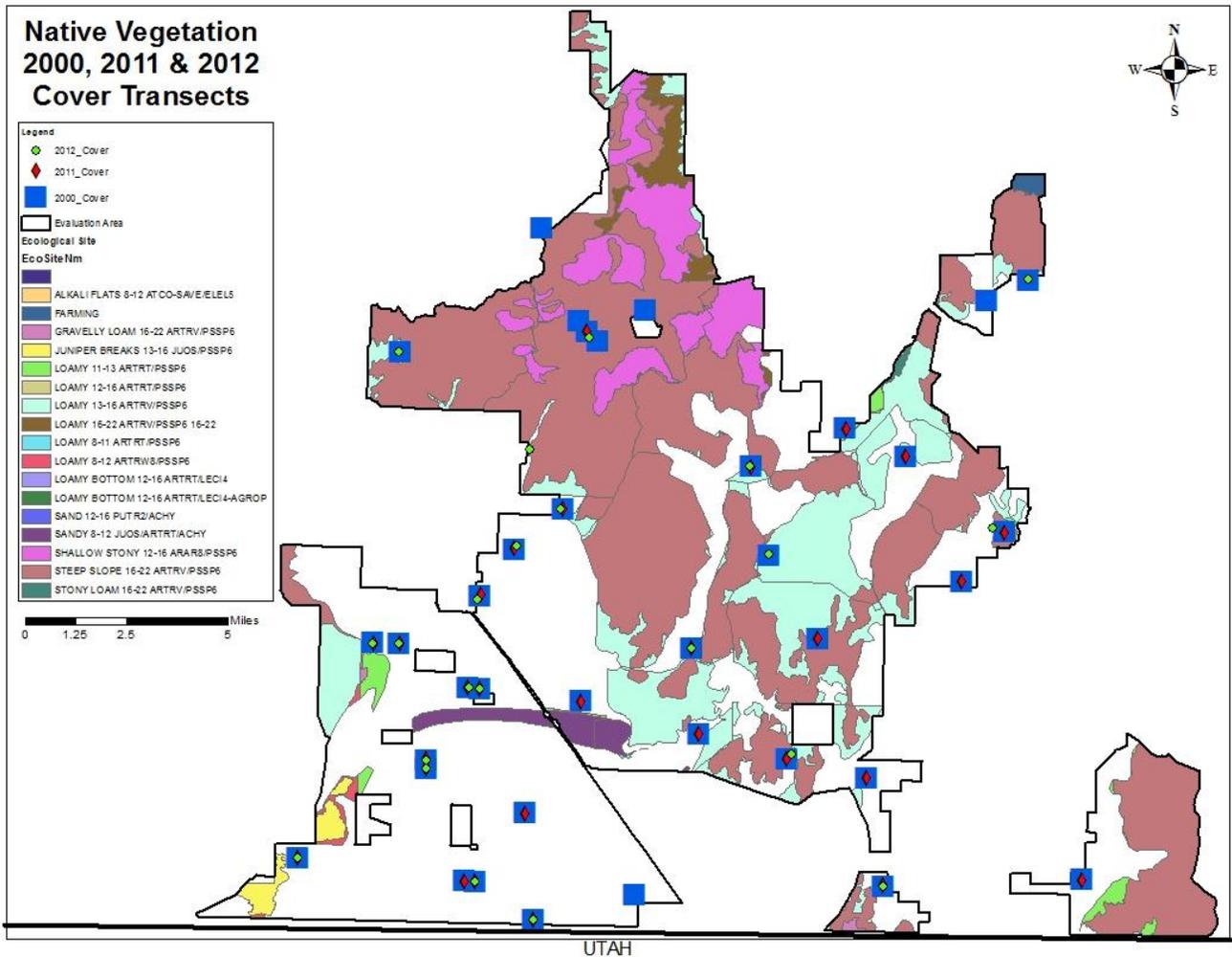


Table F-3: Average percent canopy cover for native vegetation in 2000, 2011, and 2012 by Ecological Site Discription.

| | CWG* (%) | Per. Grass (%) | POBU (%) | BRTE/BRJA (%) | Forb (%) | Weed (%) | ARTR (%) | Shrub (%) | PL (%) | NL (%) | Rock (%) | BG (%) | Crust (%) |
|--------------------------------------|----------|----------------|----------|---------------|----------|----------|----------|-----------|--------|--------|----------|--------|-----------|
| Steep Slope 16-22 ARTRV/PSSP6 | 2.3 | 29.8 | 0.3 | 9.2 | 13.6 | 2.8 | 15.9 | 11.8 | 11.6 | 51.9 | 10.4 | 15.2 | 3.7 |
| Loamy 11-13 ARTRT/PSSP6 | 13.5 | 26 | 1 | 11 | 6.5 | 0.5 | 7 | 6.5 | 7 | 58 | 0 | 25 | 4.5 |
| Loamy 13-16 ARTRV/PSSP6 | 0 | 36 | 3 | 8 | 19 | 0.5 | 24 | 17 | 19.5 | 47.5 | 0 | 23.5 | 1 |
| 2000 | | | | | | | | | | | | | |
| Steep Slope 16-22 ARTRV/PSSP6 | 28.5 | 20 | 11 | 4.3 | 7.3 | 0.8 | 10 | 6.4 | 5.3 | 27 | 0 | 8.3 | 0 |
| Loamy 11-13 ARTRT/PSSP6 | 22 | 0 | 25 | 2 | 7 | 0 | 6 | 4 | 3 | 40 | 1 | 12 | 0 |
| Loamy 13-16 ARTRV/PSSP6 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| 2011 | | | | | | | | | | | | | |
| Steep Slope 16-22 ARTRV/PSSP6 | 9.5 | 30.7 | 7.4 | 7.4 | 9.1 | 2.4 | 10.9 | 9.6 | 4.1 | 61.1 | 7.1 | 21.7 | 0.1 |
| Loamy 11-13 ARTRT/PSSP6 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| Loamy 13-16 ARTRV/PSSP6 | 0 | 47 | 0 | 5.5 | 13.5 | 2.5 | 0 | 5.5 | 2 | 48.5 | 32.5 | 9 | 0 |

| | | | | | | | | | | | | | |
|------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 2012 | | | | | | | | | | | | | |
|------|--|--|--|--|--|--|--|--|--|--|--|--|--|

*CWG = Crested wheatgrass; Per. Grass = Perennial grass; POBU = Bulbous bluegrass; BRTE/BRJA = Cheatgrass and Japanese Brome; ARTR = Sagebrush; PL = Persistent litter; NL = Non-persistent litter; BG = Bare ground; Crust = Microbiotic crust and moss.

** No data.

Figure F-3: Map of Cover transects locations for 2000, 2011, and 2012. The Ecological Sites are depicted for the seeding areas.

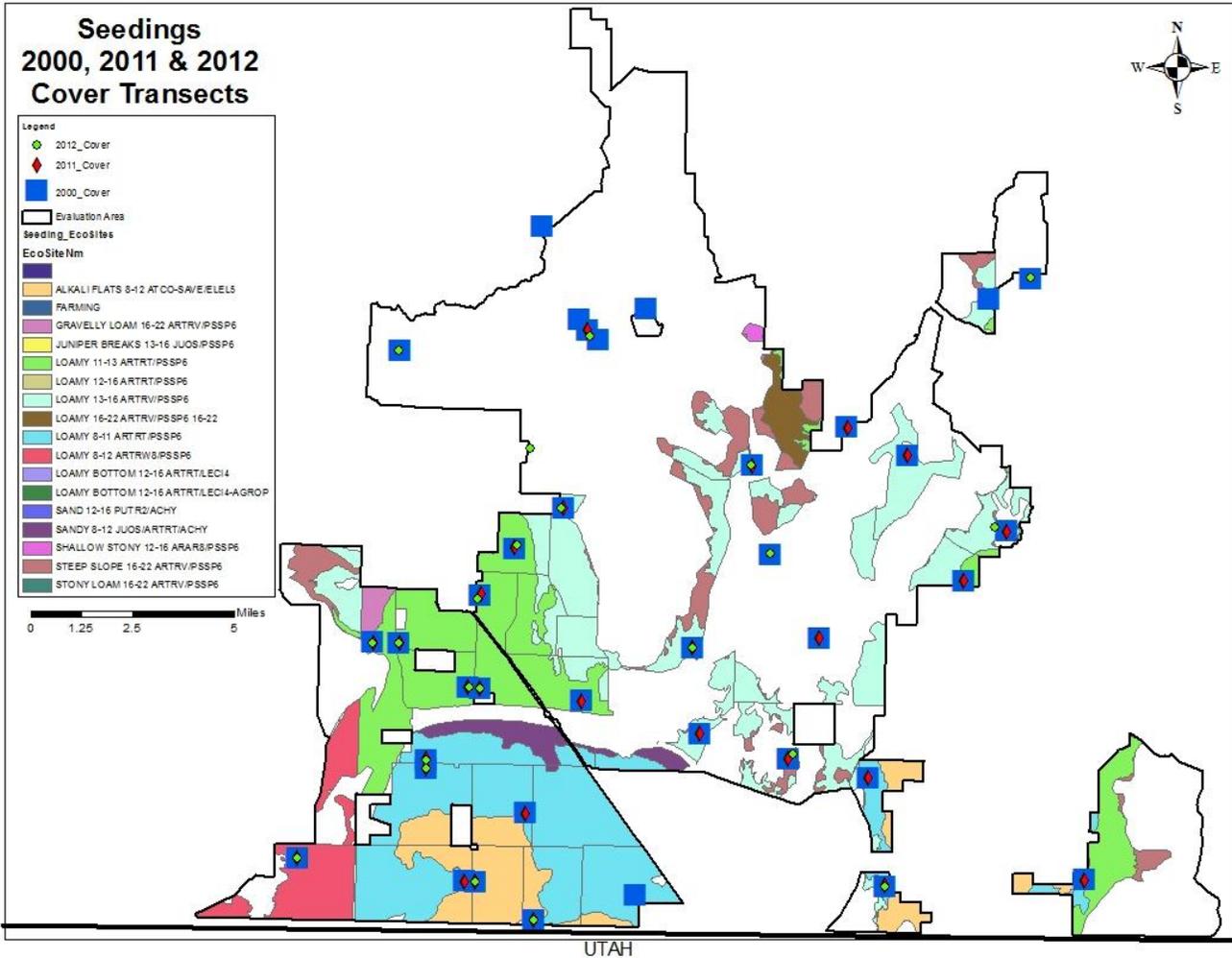


Table F-4: Average percent canopy cover for seedings in 2000, 2011, and 2012 by ecological site description.

| | CWG* (%) | Per. Grass (%) | POBU (%) | BRTE/BRJA (%) | Forb (%) | Weed (%) | ARTR (%) | Shrub (%) | PL (%) | NL (%) | Rock (%) | BG (%) | Crust (%) |
|-----------------------------------|----------|----------------|----------|---------------|----------|----------|----------|-----------|--------|--------|----------|--------|-----------|
| Alkali Flats 8-12 ATCO-SAVE/ELEL5 | 31.5 | 0.8 | 0 | 9.5 | 1.3 | 1.3 | 1 | 8 | 4.3 | 46 | 0 | 36.8 | 13 |
| Loamy 8-12 ARTRW8/PSSP6 | 2 | 19 | 0 | 10.5 | 5 | 0 | 14.5 | 12.5 | 10 | 29.5 | 1 | 27 | 22 |
| Loamy 8-11 ARTRT/PSSP6 | 32.8 | 4 | 0 | 3.2 | 0.2 | 0.5 | 7.2 | 2.3 | 7.1 | 39.3 | 0.1 | 28.1 | 11.8 |
| Loamy 11-13 ARTRT/PSSP6 | 27.3 | 7.2 | 6.1 | 1.9 | 1.3 | 0.9 | 13.6 | 6.2 | 8.9 | 36.9 | 4.1 | 27 | 7.6 |
| Loamy 13-16 ARTRV/PSSP6 | 38.1 | 8.3 | 0.4 | 1.1 | 3.2 | 0.6 | 11.2 | 3.8 | 8.8 | 53.7 | 2.7 | 23.3 | 2.2 |
| 2000 | | | | | | | | | | | | | |
| Alkali Flats 8-12 ATCO-SAVE/ELEL5 | 0.5 | 0.5 | 0 | 20 | 8 | 20 | 10 | 15.5 | 9.5 | 42 | 0 | 22.5 | 1 |
| Loamy 8-12 ARTRW8/PSSP6 | 0 | 30 | 0 | 33 | 9 | 3 | 0 | 4 | 2 | 72 | 4 | 8 | 0 |
| Loamy 8-11 ARTRT/PSSP6 | 40.4 | 0.1 | 2.3 | 0 | 0.3 | 7.1 | 12.7 | 3.6 | 3.1 | 42.4 | 0.1 | 26.9 | 1.1 |

| | | | | | | | | | | | | | |
|---|------|------|------|-----|-----|-----|------|-----|-----|------|-----|------|-----|
| Loamy 11-13 ARTRT/PSSP6 | 26.9 | 4.9 | 23.4 | 0.6 | 1.9 | 6.9 | 11.3 | 5.7 | 2.4 | 52.4 | 0.6 | 17.9 | 0.6 |
| Loamy 13-16 ARTRV/PSSP6 | 49.4 | 4.4 | 9.4 | 1.8 | 6 | 0 | 1 | 5.6 | 2.2 | 33 | 2.8 | 10.8 | 0 |
| 2011 | | | | | | | | | | | | | |
| Alkali Flats 8-12 ATCO- SAVE/ELEL5 | 62.5 | 0 | 0 | 0 | 0.5 | 0 | 2.5 | 10 | 3 | 41.5 | 0 | 40.5 | 3 |
| Loamy 8-12 ARTRW8/PSSP6 | 23 | 32.5 | 0 | 23 | 1.5 | 0 | 0 | 2.5 | 0.5 | 70.5 | 8 | 18.5 | 0 |
| Loamy 8-11 ARTRT/PSSP6 | 27.4 | 1.9 | 0 | 0 | 0.5 | 0.1 | 9.9 | 2.1 | 2.4 | 46.5 | 0 | 48.3 | 1.6 |
| Loamy 11-13 ARTRT/PSSP6 | 35.4 | 11.6 | 13.4 | 1.6 | 2.2 | 0 | 10.7 | 6.3 | 4.6 | 65.7 | 1.4 | 26.7 | 1.3 |
| Loamy 13-16 ARTRV/PSSP6 | 34.8 | 13 | 8.5 | 0.5 | 6.5 | 1.5 | 0 | 4.8 | 0.5 | 75 | 0 | 20.8 | 0 |
| 2012 | | | | | | | | | | | | | |

*CWG = Crested wheatgrass; Per. Grass = Perennial grass; POBU = Bulbous bluegrass; BRTE/BRJA = Cheatgrass and Japanese Brome; ARTR = Sagebrush; PL = Persistent litter; NL = Non-persistent litter; BG = Bare ground; Crust = Microbiotic crust and moss.

**Data not available.

Table F-5: Percent cover for crested wheatgrass, perennial grasses, bulbous bluegrass, cheatgrass, forbs, weeds, sagebrush, persistent litter, non-persistent litter, rock, bare ground, and crust by pasture for 2000, 2011, & 2012.

| PASTURE | YEAR | CWG (%) | Per. GRASS (%) | POBU (%) | BRTE/BRJA (%) | FORB (%) | WEED (%) | ARTR (%) | SHRUB (%) | PL (%) | NL (%) | RK (%) | BG (%) | CRUST (%) |
|-----------------------|------|---------|----------------|----------|---------------|----------|----------|----------|-----------|--------|--------|--------|--------|-----------|
| Antelope | 2000 | 26 | 0.5 | 0 | 19 | 0.5 | 2.5 | 0 | 11.5 | 4.5 | 45.5 | 0 | 31.5 | 18.5 |
| | 2011 | 0 | 1 | 0 | 34 | 0 | 39 | 5 | 20 | 11 | 37 | 0 | 16 | 2 |
| | 2012 | 62.5 | 0 | 0 | 0 | 0.5 | 0 | 2.5 | 10 | 3 | 41.5 | 0 | 40.5 | 3 |
| Bowhuis | 2000 | 32.5 | 0 | 0 | 0 | 0 | 0 | 3 | 2.5 | 10.5 | 44.5 | 0 | 29.5 | 3.5 |
| | 2011 | 30 | 0 | 3 | 0 | 0 | 1 | 12 | 6 | 5 | 42 | 0 | 22 | 0 |
| | 2012 | 23.5 | 0 | 0 | 0 | 0 | 0 | 11.5 | 1.5 | 3 | 32.5 | 0 | 62 | 0 |
| <u>Cove (f)*</u> | 2000 | 30 | 4 | 0 | 0 | 0 | 2 | 22.5 | 0.5 | 8 | 44 | 0 | 36.5 | 2 |
| | 2011 | 39 | 9 | 16 | 1 | 2 | 0 | 3 | 8 | 0 | 3 | 21 | 0 | 17 |
| | 2012 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| <u>Cove Burn (f)</u> | 2000 | 1 | 30.5 | 0 | 13.5 | 1.5 | 2 | 0 | 1.5 | 9.5 | 55 | 6 | 15 | 4 |
| | 2011 | 29 | 19 | 16 | 13 | 4 | 1 | 3 | 8 | 7 | 27 | 0 | 3 | 0 |
| | 2012 | 0 | 90.5 | 1.5 | 17.5 | 6 | 3.5 | 0.5 | 47 | 3.5 | 67.5 | 1.5 | 22.5 | 0.5 |
| <u>Cow Hollow (f)</u> | 2000 | 34.5 | 24 | 0.5 | 2 | 6.5 | 1.5 | 2.5 | 3 | 2.5 | 69.5 | 0.5 | 21 | 1 |
| | 2011 | 57 | 12 | 15 | 3 | 1 | 0 | 1 | 7 | 0 | 27 | 0 | 6 | 0 |
| | 2012 | 39 | 10.5 | 16.5 | 1 | 6 | 3 | 0 | 3.5 | 1 | 79 | 0 | 15 | 0 |
| <u>Crazy Canyon</u> | 2000 | 0.1 | 33.3 | 1 | 6.5 | 16.3 | 7 | 14.7 | 16.3 | 12 | 45 | 17.7 | 11.3 | 4.3 |
| | 2011 | ** | ** | ** | ** | ** | ** | 32 | 8 | ** | 1 | ** | ** | ** |
| | 2012 | 0 | 30.5 | 6 | 7 | 12.5 | 0 | 9.3 | 11.5 | 4.3 | 45.5 | 22.3 | 20.3 | 0 |
| E. Black Pine | 2000 | 18.5 | 4 | 0 | 17.5 | 0.5 | 0 | 5 | 1.5 | 10.5 | 44 | 0 | 35 | 0 |
| | 2011 | 30 | 0 | 2 | 0 | 0 | 3 | 21 | 3 | 6 | 51 | 0 | 19 | 0 |
| | 2012 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| E. Cedar Hill | 2000 | 0 | 27 | 0 | 15 | 4.5 | 0 | 30.5 | 9.5 | 8.5 | 58 | 1.5 | 14 | 7.5 |
| | 2011 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| | 2012 | 18.5 | 2 | 16.5 | 0.5 | 6.5 | 0.5 | 32.5 | 1.5 | 5.5 | 60 | 0 | 32 | 0 |
| E. Stateline | 2000 | 36.5 | 0 | 0 | 0 | 1 | 4 | 1.5 | 4 | 2.5 | 32 | 0 | 42 | 13.5 |
| | 2011 | 55 | 0 | 0 | 0 | 0 | 39 | 1 | 7 | 3 | 44 | 0 | 12 | 0 |
| | 2012 | 54 | 0 | 0 | 0 | 2 | 0.5 | 0 | 3.5 | 0.5 | 63.5 | 0 | 36 | 0 |
| E. Stocker | 2000 | 35 | 0 | 0 | 0 | 0 | 2 | 7 | 0.5 | 5 | 33.5 | 0 | 41.5 | 8 |
| | 2011 | 35 | 0 | 5 | 0 | 1 | 17 | 17 | 0 | 2 | 61 | 0 | 24 | 3 |
| | 2012 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| Glen Canyon | 2000 | 0 | 42.5 | 0 | 8.5 | 7 | 0.5 | 34.5 | 8 | 16 | 69.5 | 0.5 | 9.5 | 0 |
| | 2011 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| | 2012 | 0 | 21.5 | 9 | 14.5 | 6.5 | 2.5 | 24.5 | 19.5 | 8.5 | 73 | 0 | 15.5 | 0 |
| Grandine | 2000 | 46 | 0 | 0 | 0 | 0 | 0 | 11.5 | 0.5 | 4.5 | 45.5 | 0 | 16.5 | 4 |
| | 2011 | 43 | 0 | 1 | 0 | 0 | 4 | 20 | 2 | 1 | 47 | 0 | 28 | 1 |
| | 2012 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| Grandine Pond | 2000 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |

| PASTURE | YEAR | CWG (%) | Per. GRASS (%) | POBU (%) | BRTE/BRJA (%) | FORB (%) | WEED (%) | ARTR (%) | SHRUB (%) | PL (%) | NL (%) | RK (%) | BG (%) | CRUST (%) |
|-------------------------------|------|---------|----------------|----------|---------------|----------|----------|----------|-----------|--------|--------|--------|--------|-----------|
| | 2011 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| | 2012 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| Haliday-1 | 2000 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| | 2011 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| | 2012 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| <u>Haliday-2 (f)</u> | 2000 | 37.5 | 5 | 0 | 2 | 1.5 | 0 | 20 | 3 | 12 | 53.5 | 0 | 21 | 3 |
| | 2011 | 30 | 0 | 0 | 0 | 19 | 0 | 0 | 6 | 0 | 48 | 1 | 14 | 0 |
| | 2012 | 30.5 | 1.5 | 0.5 | 0 | 7 | 0 | 0 | 6 | 0 | 71 | 0 | 26.5 | 0 |
| <u>Holbrook Burn (f)</u> | 2000 | 51.5 | 4.5 | 1.5 | 2 | 6 | 0 | 13 | 2.5 | 13 | 55 | 3.5 | 24.5 | 2 |
| | 2011 | 78 | 0 | 0 | 1 | 4 | 0 | 1 | 5 | 8 | 33 | 0 | 7 | 0 |
| | 2012 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| <u>Meadowbrook Divide (f)</u> | 2000 | 13.5 | 26 | 1 | 11 | 6.5 | 0.5 | 7 | 6.5 | 7 | 58 | 0 | 25 | 4.5 |
| | 2011 | 22 | 0 | 25 | 2 | 7 | 0 | 6 | 4 | 3 | 40 | 1 | 12 | 0 |
| | 2012 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| N. Black Pine | 2000 | 52 | 0 | 0 | 0 | 0 | 0 | 6.5 | 7 | 7.5 | 30 | 0 | 30 | 22 |
| | 2011 | 43 | 0 | 0 | 0 | 0 | 0 | 15 | 3 | 5 | 43 | 0 | 32 | 0 |
| | 2012 | 26.5 | 0 | 0 | 0 | 0 | 0 | 8 | 3.5 | 5 | 40 | 0 | 52.5 | 0 |
| N. Brush | 2000 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| | 2011 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| | 2012 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| <u>N. Bowen (f)</u> | 2000 | 0 | 13.5 | 0 | 2.5 | 29.5 | 1 | 6 | 23 | 8 | 25 | 33 | 24 | 9 |
| | 2011 | 35 | 2 | 0 | 0 | 14 | 2 | 0 | 0 | 2 | 43 | 0 | 14 | 0 |
| | 2012 | 48 | 18.5 | 11.5 | 0 | 4.5 | 3 | 0 | 1.5 | 1.5 | 67.5 | 3.5 | 25 | 0 |
| <u>North Canyon S 1/2 (f)</u> | 2000 | 0 | 21 | 0 | 17.5 | 14.5 | 0.5 | 24.5 | 9.5 | 21 | 55.5 | 0 | 18 | 0 |
| | 2011 | 3 | 56 | 3 | 4 | 10 | 0 | 0 | 4 | 8 | 19 | 0 | 12 | 0 |
| | 2012 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| <u>North Canyon N 1/2 (f)</u> | 2000 | 0 | 36 | 3 | 8 | 19 | 0.5 | 24 | 17 | 19.5 | 47.5 | 0 | 23.5 | 1 |
| | 2011 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| | 2012 | 0 | 47 | 0 | 5.5 | 13.5 | 2.5 | 0 | 5.5 | 2 | 48.5 | 32.5 | 9 | 0 |
| <u>N. Mills (f)</u> | 2000 | 32 | 3 | 4 | 0 | 0.5 | 0 | 17 | 8 | 8 | 45 | 10.5 | 11.5 | 14.5 |
| | 2011 | 39 | 0 | 35 | 0 | 1 | 0 | 0 | 4 | 1 | 50 | 3 | 16 | 0 |
| | 2012 | 30 | 3.5 | 9.5 | 0 | 0.5 | 0 | 0 | 1 | 2.5 | 77 | 6 | 13 | 1.5 |
| Pipeline | 2000 | 11 | 17.5 | 1.5 | 10 | 2 | 1 | 9 | 4 | 14 | 48 | 4.5 | 20 | 0.5 |
| | 2011 | 13 | 28 | 28 | 4 | 6 | 3 | 15 | 5 | 3 | 41 | 0 | 7 | 0 |
| | 2012 | 10.5 | 17 | 55.5 | 5.5 | 2.5 | 0 | 26.5 | 7.5 | 7 | 64.5 | 1.5 | 22.5 | 0 |
| Roe | 2000 | 35.5 | 1 | 0 | 0 | 0 | 0 | 8.5 | 0.5 | 8 | 34.5 | 0.5 | 25.5 | 22 |
| | 2011 | 35 | 0 | 2 | 0 | 1 | 2 | 20 | 1 | 2 | 36 | 1 | 43 | 7 |
| | 2012 | 55.5 | 7.5 | 0 | 0 | 0 | 0 | 20 | 0 | 1 | 50 | 0 | 42.5 | 6.5 |
| Section 24 | 2000 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| | 2011 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |

| PASTURE | YEAR | CWG (%) | Per. GRASS (%) | POBU (%) | BRTE/BRJA (%) | FORB (%) | WEED (%) | ARTR (%) | SHRUB (%) | PL (%) | NL (%) | RK (%) | BG (%) | CRUST (%) |
|--------------------------|------|---------|----------------|----------|---------------|----------|----------|----------|-----------|--------|--------|--------|--------|-----------|
| | 2012 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| S. Black Pine | 2000 | 37 | 1 | 0 | 0 | 2 | 0 | 2 | 4.5 | 4 | 46.5 | 0 | 42 | 7.5 |
| | 2011 | 1 | 0 | 0 | 6 | 16 | 1 | 15 | 11 | 8 | 47 | 0 | 29 | 0 |
| | 2012 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| S. Brush | 2000 | 1.5 | 25.5 | 0 | 8 | 0 | 0 | 14 | 1.5 | 8.5 | 38 | 0 | 30 | 7 |
| | 2011 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| | 2012 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| <u>S. Bowen (f)</u> | 2000 | 45 | 3 | 0 | 0.5 | 0 | 0 | 8.5 | 11.5 | 15.5 | 41.5 | 10 | 19 | 3 |
| | 2011 | 43 | 1 | 16 | 4 | 4 | 0 | 0 | 2 | 0 | 36 | 13 | 10 | 0 |
| | 2012 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| S. Mills | 2000 | 36.5 | 3 | 0 | 0 | 1 | 1.5 | 21 | 2 | 14.5 | 31.5 | 2.5 | 32 | 11.5 |
| | 2011 | 28 | 0 | 4 | 0 | 0 | 18 | 22 | 2 | 2 | 50 | 0 | 29 | 1 |
| | 2012 | 38.5 | 3 | 0 | 0 | 0.5 | 0 | 29.5 | 4 | 6.5 | 55.5 | 0 | 40 | 0 |
| <u>Stone (f)</u> | 2000 | 40 | 1.5 | 0 | 0 | 0 | 0 | 7.5 | 1 | 5 | 45.5 | 0 | 16.5 | 22.5 |
| | 2011 | 47 | 1 | 8 | 0 | 1 | 1 | 0 | 3 | 0 | 34 | 0 | 32 | 0 |
| | 2012 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| <u>Trail Canyon (f)</u> | 2000 | 19 | 34 | 0 | 6.5 | 16.5 | 0 | 3.5 | 5.5 | 5.5 | 69.5 | 0 | 22.5 | 0 |
| | 2011 | 47 | 3 | 25 | 0 | 1 | 0 | 14 | 10 | 4 | 19 | 0 | 4 | 0 |
| | 2012 | 0 | 21.5 | 1.5 | 5.5 | 15.5 | 7 | 0.5 | 18 | 1.5 | 68.5 | 0.5 | 16.5 | 0 |
| <u>Van Koman (f)</u> | 2000 | 2.5 | 10 | 36 | 2.5 | 1.5 | 0 | 35.5 | 7.5 | 7 | 22 | 6 | 10 | 17.5 |
| | 2011 | 34 | 6 | 27 | 0 | 0 | 0 | 0 | 2 | 1 | 53 | 0 | 9 | 0 |
| | 2012 | 55 | 10.5 | 7.5 | 2.5 | 1.5 | 0 | 0 | 3.5 | 4 | 72 | 1 | 15 | 0 |
| <u>W. Black Pine (f)</u> | 2000 | 2 | 19 | 0 | 10.5 | 5 | 0 | 14.5 | 12.5 | 10 | 29.5 | 1 | 27 | 22 |
| | 2011 | 0 | 30 | 0 | 33 | 9 | 3 | 0 | 4 | 2 | 72 | 4 | 8 | 0 |
| | 2012 | 23 | 32.5 | 0 | 23 | 1.5 | 0 | 0 | 2.5 | 0.5 | 70.5 | 8 | 18.5 | 0 |
| W. Cedar Hills | 2000 | 30 | 9 | 0.5 | 0 | 5 | 0 | 0.5 | 2 | 2 | 58.5 | 2 | 18 | 2 |
| | 2011 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| | 2012 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| W. Stocker | 2000 | 49.5 | 0 | 0.5 | 0 | 0 | 2 | 1.5 | 5 | 4.5 | 33 | 0 | 46 | 0.5 |
| | 2011 | 29 | 0 | 13 | 0 | 0 | 10 | 6 | 18 | 1 | 55 | 0 | 24 | 0 |
| | 2012 | 64 | 1.5 | 0 | 0 | 4.5 | 0 | 1 | 9.5 | 3 | 57 | 0 | 40.5 | 0 |
| Wight | 2000 | 24.5 | 17 | 1 | 0.5 | 4 | 0 | 4.5 | 16.5 | 9 | 45.5 | 5.5 | 28 | 1 |
| | 2011 | 10 | 0 | 52 | 0 | 5 | 0 | 19 | 9 | 7 | 57 | 1 | 16 | 0 |
| | 2012 | 14.5 | 34 | 8 | 1.5 | 3.5 | 0 | 7 | 10 | 4.5 | 68 | 0 | 29 | 0 |

* indicates pastures which were affected by fires between 2000 and 2012.

** depicts sites where data is not available.

2013 Cover Data

Cover data was collected in 2013 at the same locations as the HAF (Sage Grouse Habitat Assessment Framework) and LHA (Land Health Assessment). The Line Intercept protocol was followed utilizing a 50m tape and collecting data every half meter. A total of 100 points were read per Site ID. This information is summarized in Table F-6 located below. The same categories used to summarize the data from 2000, 2011, and 2012 were used to summarize the data collected in 2013.

Figure F-4: Location of Cover Plots Conducted in 2013.

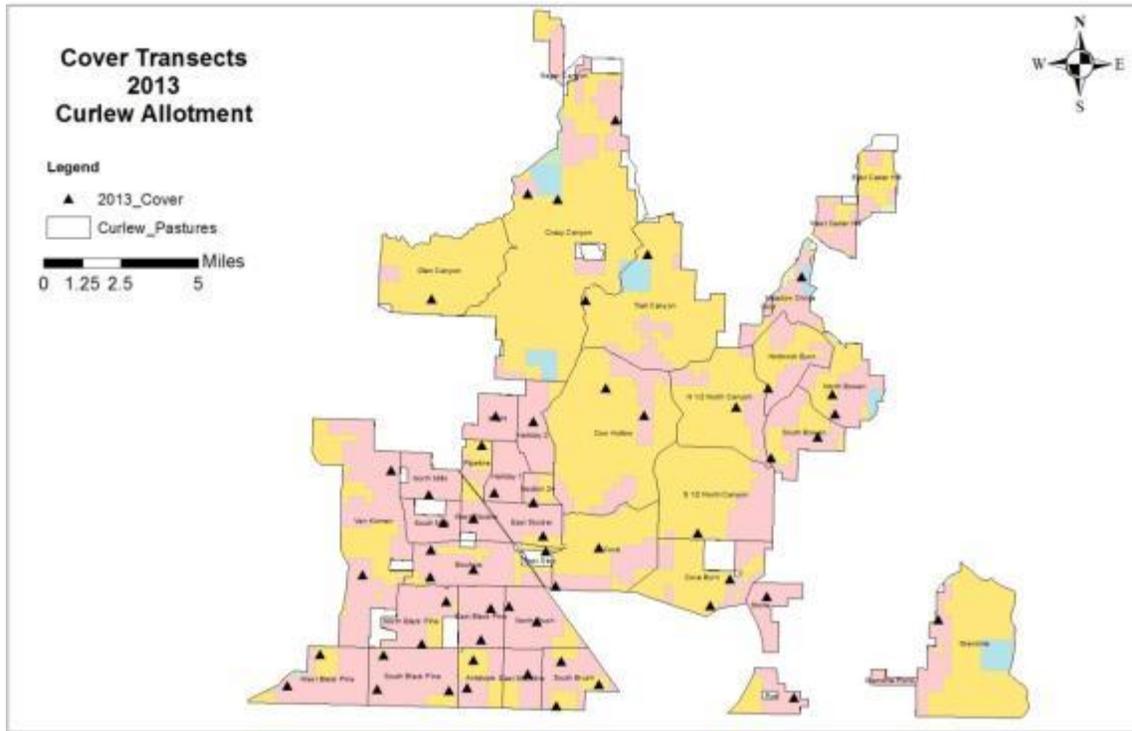


Figure F-5: Map of Site ID locations for cover data within Native Vegetation collected in 2013 with the ecological sites depicted.

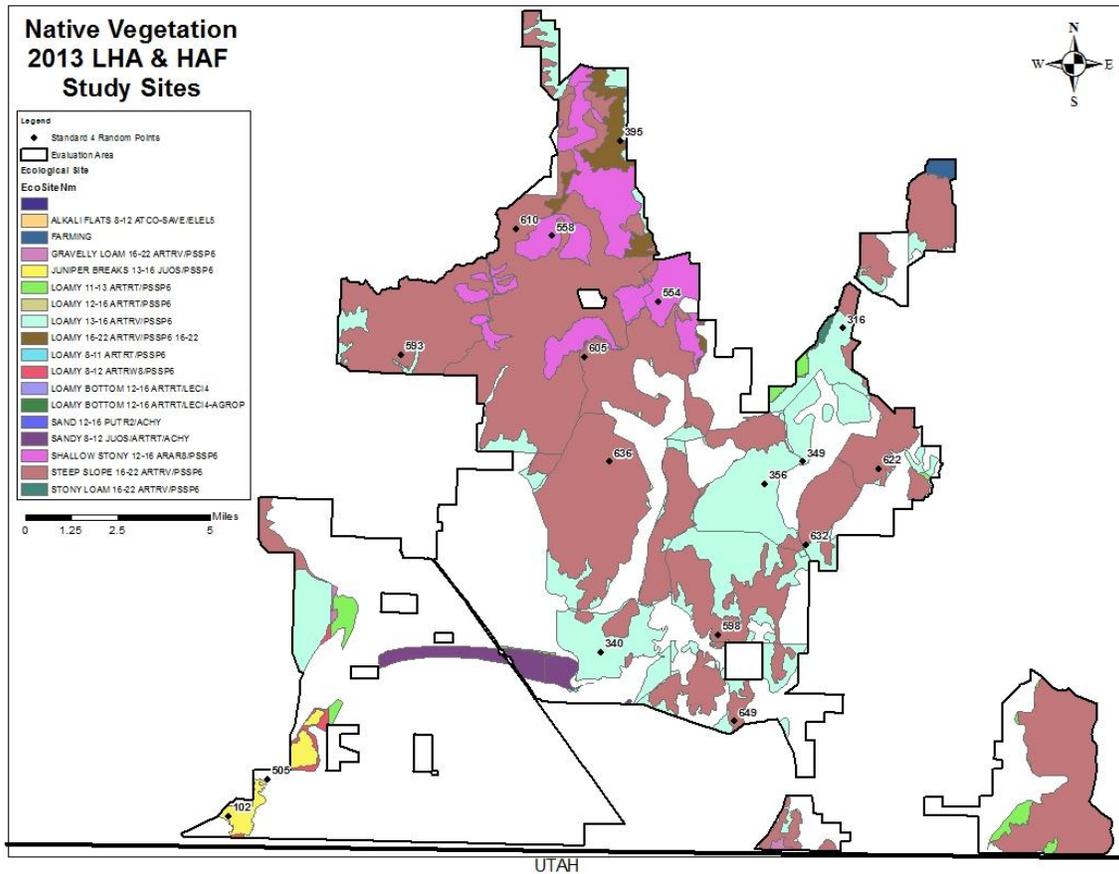


Table F-6: Average percent canopy cover for native vegetation in 2013.

| EcoSite | CWG* (%) | Per. Grass (%) | POBU (%) | BRTE/BRJA (%) | Forb (%) | Weed (%) | ARTR (%) | Shrub (%) | PL (%) | NL (%) | Rock (%) | BG (%) | Crust (%) |
|---------------------------------|----------|----------------|----------|---------------|----------|----------|----------|-----------|--------|--------|----------|--------|-----------|
| Steep Slope 16-22 ARTRV/PSSP6 | 0.125 | 22.4 | 4.5 | 2.3 | 4.1 | 0 | 2.1 | 17.9 | 6.4 | 52.8 | 13.8 | 21.4 | 2.6 |
| Shallow Stony 12-16 ARAR8/PSSP6 | 0 | 29.5 | 6 | 0 | 18.5 | 0 | 9 | 5 | 4.5 | 40.5 | 28.5 | 18 | 0.5 |
| Loamy 16-22 ARTRV/PSSP6 | 0 | 26 | 12 | 0 | 12 | 0 | 3 | 51 | 7 | 35 | 2 | 16 | 0 |
| Loamy 13-16 ARTRV/PSSP6 | 5.5 | 29.8 | 0.25 | 6 | 7.5 | 1 | 1 | 5 | 1 | 58.3 | 23.5 | 24.8 | 0.5 |
| Loamy 8-12 ARTRW8/PSSP6 | 4 | 18 | 0 | 3 | 7 | 0 | 0 | 0 | 1 | 48 | 10 | 35 | 1 |
| Juniper Breaks 13-16 JUOS/PSSP6 | 2 | 33 | 0 | 4 | 4 | 0 | 0 | 0 | 0 | 63 | 7 | 23 | 0 |

*CWG = Crested wheatgrass; Per. Grass = Perennial grass; POBU = Bulbous bluegrass; BRTE/BRJA = Cheatgrass and Japanese Brome; ARTR = Sagebrush; PL = Persistent litter; NL = Non-persistent litter; BG = Bare ground; Crust = Microbiotic crust and moss.

Figure F-6: Map of Site ID locations for cover data within Seedings collected in 2013 with Ecological Sites depicted.

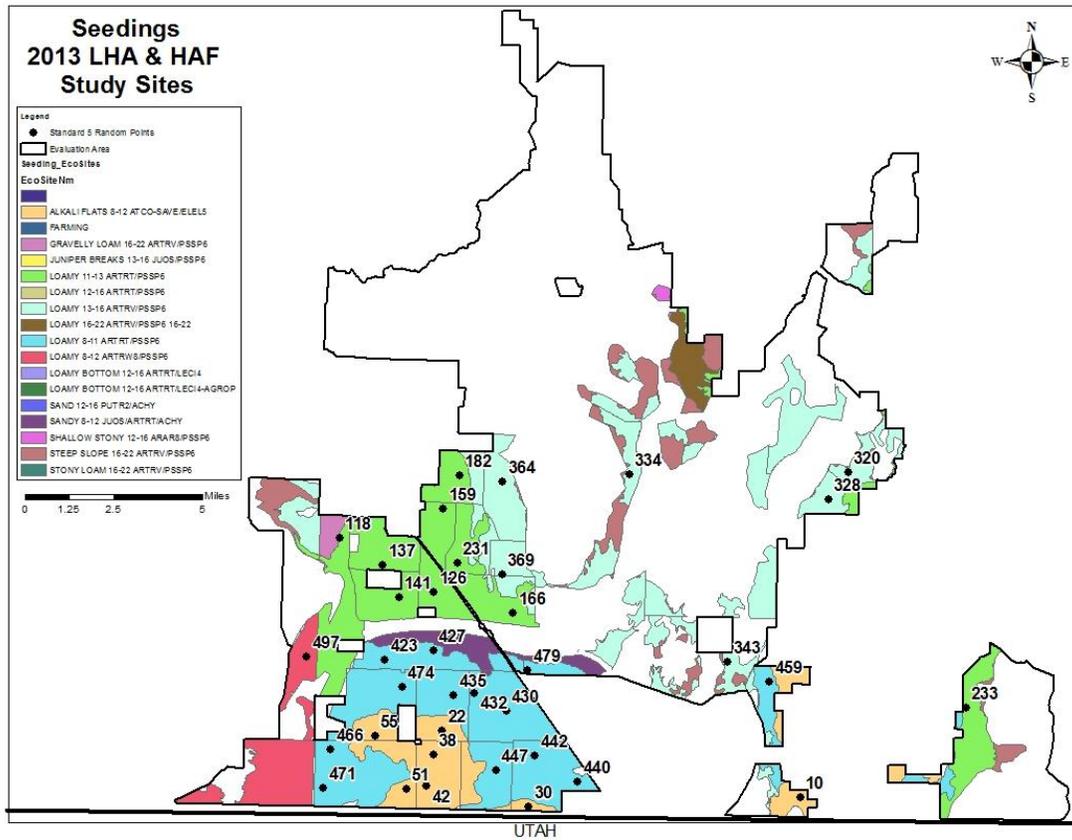


Table F-7: Average percent canopy cover for seedings in 2013.

| Eco Site | CWG* (%) | Per. Grass (%) | POBU (%) | BRTE/BRJA (%) | Forb (%) | Weed (%) | ARTR (%) | Shrub (%) | PL (%) | NL (%) | Rock (%) | BG (%) | Crust (%) |
|-----------------------------------|----------|----------------|----------|---------------|----------|----------|----------|-----------|--------|--------|----------|--------|-----------|
| Loamy 8-11 ARTRT/PSSP6 | 16.1 | 3.9 | 0 | 2.7 | 0.2 | 0.6 | 5.5 | 2.8 | 3.3 | 52.4 | 0 | 36.7 | 5.1 |
| Loamy 11-13 ARTRT/PSSP6 | 26 | 2.2 | 4.2 | 0 | 0.8 | 0 | 15.2 | 4.1 | 2.6 | 62.6 | 3.9 | 22.3 | 6.6 |
| Loamy 13-16 ARTRV/PSSP6 | 22 | 8.7 | 2.3 | 2.5 | 4.7 | 0.5 | 1.3 | 3.8 | 1.3 | 65.8 | 1 | 26.8 | 0.2 |
| Loamy 8-12 ARTRW/PSSP6 | 3 | 27 | 0 | 2 | 0 | 0 | 0 | 3 | 1 | 66 | 2 | 31 | 0 |
| Alkali Flats 8-12 ATCO-SAVE/ELEL5 | 6.1 | 3.1 | 0 | 4.3 | 0.1 | 7.7 | 9 | 7.3 | 1.6 | 59 | 0.4 | 30.6 | 7.7 |

*CWG = Crested wheatgrass; Per. Grass = Perennial grass; POBU = Bulbous bluegrass; BRTE/BRJA = Cheatgrass and Japanese Brome; ARTR = Sagebrush; PL = Persistent litter; NL = Non-persistent litter; BG = Bare ground; Crust = Microbiotic crust and moss.

Table F-8: Comparison of percent cover for crested wheatgrass, perennial grasses, bulbous bluegrass, cheatgrass, forbs, weeds, sagebrush, persistent litter, non-persistent litter, rock, bare ground, and crust by Site ID and Pasture in 2013.

| PASTURE | Site ID | CWG (%) | Per. GRASS (%) | POBU (%) | BRTE/BRJA (%) | FORB (%) | WEED (%) | ARTR (%) | SHRUB (%) | PL (%) | NL (%) | RK (%) | BG (%) | CRUST (%) |
|--------------------|---------|---------|----------------|----------|---------------|----------|----------|----------|-----------|--------|--------|--------|--------|-----------|
| Antelope | 038 | 0 | 0 | 0 | 7 | 0 | 11 | 0 | 30 | 4 | 58 | 0 | 35 | 3 |
| | 042 | 1 | 0 | 0 | 13 | 0 | 19 | 2 | 10 | 1 | 79 | 0 | 9 | 11 |
| Bowhuis | 423 | 26 | 0 | 0 | 0 | 0 | 0 | 10 | 1 | 3 | 45 | 0 | 37 | 10 |
| | 427 | 34 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 4 | 61 | 0 | 26 | 3 |
| | 518 | 4 | 4 | 0 | 2 | 1 | 0 | 13 | 3 | 14 | 34 | 2 | 36 | 10 |
| Cove | 340 | 0 | 13 | 0 | 13 | 6 | 3 | 0 | 0 | 0 | 69 | 0 | 31 | 0 |
| | 479 | 13 | 0 | 0 | 2 | 1 | 3 | 0 | 16 | 3 | 48 | 0 | 49 | 0 |
| Cove Burn | 343 | 0 | 3 | 1 | 15 | 18 | 3 | 0 | 10 | 1 | 59 | 0 | 40 | 0 |
| | 649 | 0 | 16 | 0 | 6 | 1 | 0 | 0 | 2 | 4 | 43 | 13 | 27 | 13 |
| Cow Hollow | 334 | 0 | 47 | 6 | 0 | 3 | 0 | 8 | 3 | 1 | 84 | 1 | 13 | 0 |
| | 636 | 0 | 29 | 2 | 7 | 7 | 0 | 0 | 16 | 3 | 46 | 14 | 33 | 0 |
| Crazy Canyon | 395 | 0 | 26 | 12 | 0 | 12 | 0 | 3 | 51 | 7 | 35 | 2 | 16 | 0 |
| | 558 | 0 | 22 | 1 | 0 | 14 | 0 | 11 | 1 | 7 | 19 | 42 | 19 | 1 |
| | 610 | 0 | 9 | 19 | 0 | 8 | 0 | 12 | 37 | 11 | 72 | 5 | 9 | 2 |
| E. Black Pine | 022 | 0 | 4 | 0 | 8 | 0 | 24 | 8 | 0 | 1 | 65 | 0 | 31 | 2 |
| | 435 | 28 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 58 | 0 | 37 | 4 |
| E. Cedar Hill | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| E. Stateline | 447 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 66 | 0 | 27 | 3 |
| E. Stocker | 166 | 17 | 0 | 0 | 0 | 0 | 0 | 10 | 5 | 2 | 50 | 1 | 46 | 0 |
| Glen Canyon | 593 | 0 | 9 | 15 | 0 | 2 | 0 | 4 | 35 | 5 | 81 | 1 | 12 | 0 |
| Grandine | 233 | 20 | 2 | 14 | 0 | 1 | 0 | 22 | 1 | 8 | 54 | 1 | 18 | 11 |
| Grandine Pond | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| Holiday-1 | 231 | 39 | 0 | 0 | 0 | 2 | 0 | 9 | 9 | 3 | 70 | 0 | 24 | 1 |
| Holiday-2 | 364 | 35 | 2 | 0 | 0 | 3 | 0 | 0 | 9 | 1 | 59 | 0 | 40 | 0 |
| Holbrook Burn | 349 | 22 | 14 | 1 | 1 | 7 | 1 | 3 | 1 | 0 | 38 | 31 | 26 | 1 |
| Meadowbrook Divide | 316 | 0 | 51 | 0 | 0 | 6 | 0 | 1 | 15 | 4 | 77 | 1 | 15 | 0 |
| N. Black Pine | 055 | 19 | 0 | 0 | 0 | 0 | 0 | 8 | 1 | 0 | 52 | 1 | 40 | 7 |
| | 474 | 14 | 0 | 0 | 0 | 0 | 2 | 6 | 2 | 2 | 45 | 0 | 44 | 9 |
| N. Brush | 430 | 0 | 18 | 0 | 6 | 0 | 0 | 23 | 1 | 2 | 68 | 0 | 24 | 2 |
| | 432 | 7 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 1 | 14 | 0 | 82 | 1 |
| N. Bowen | 320 | 25 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 59 | 2 | 31 | 0 |
| | 622 | 1 | 14 | 0 | 0 | 9 | 0 | 0 | 5 | 20 | 23 | 26 | 15 | 2 |
| North Canyon N 1/2 | 356 | 0 | 41 | 0 | 10 | 11 | 0 | 0 | 4 | 0 | 49 | 15 | 27 | 1 |
| North Canyon S 1/2 | 598 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 19 | 4 | 19 | 33 | 43 | 1 |

| PASTURE | Site ID | CWG (%) | Per. GRASS (%) | POBU (%) | BRTE/BRJA (%) | FORB (%) | WEED (%) | ARTR (%) | SHRUB (%) | PL (%) | NL (%) | RK (%) | BG (%) | CRUST (%) |
|----------------|---------|---------|----------------|----------|---------------|----------|----------|----------|-----------|--------|--------|--------|--------|-----------|
| N. Mills | 137 | 38 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 3 | 84 | 10 | 1 | 0 |
| Pipeline | 159 | 33 | 0 | 0 | 0 | 0 | 0 | 20 | 1 | 0 | 61 | 7 | 18 | 14 |
| Rest Stop | 531 | 5 | 14 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | 33 | 0 | 27 | 37 |
| Roe | 010 | 20 | 3 | 0 | 0 | 0 | 0 | 22 | 1 | 3 | 43 | 2 | 33 | 16 |
| Section 24 | 369 | 28 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 5 | 69 | 0 | 22 | 1 |
| S. Black Pine | 051 | 3 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 2 | 48 | 0 | 47 | 3 |
| | 466 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 11 | 36 | 0 | 37 | 13 |
| | 471 | 18 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 48 | 0 | 40 | 6 |
| S. Brush | 030 | 0 | 15 | 0 | 2 | 1 | 0 | 19 | 9 | 0 | 68 | 0 | 19 | 12 |
| | 440 | 0 | 5 | 0 | 7 | 0 | 0 | 18 | 4 | 17 | 42 | 0 | 29 | 11 |
| | 442 | 1 | 26 | 0 | 20 | 0 | 0 | 13 | 3 | 0 | 71 | 0 | 26 | 2 |
| S. Bowen | 328 | 44 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 65 | 3 | 15 | 0 |
| | 632 | 0 | 38 | 0 | 1 | 1 | 0 | 0 | 0 | 4 | 75 | 0 | 17 | 2 |
| S. Mills | 141 | 19 | 3 | 0 | 0 | 0 | 0 | 29 | 4 | 3 | 32 | 0 | 37 | 27 |
| Stone | 459 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 79 | 0 | 19 | 2 |
| Trail Canyon | 554 | 0 | 37 | 11 | 0 | 23 | 0 | 7 | 9 | 2 | 62 | 15 | 17 | 0 |
| | 605 | 0 | 61 | 0 | 4 | 5 | 0 | 1 | 29 | 0 | 63 | 18 | 15 | 1 |
| Van Koman | 118 | 44 | 9 | 20 | 0 | 3 | 0 | 0 | 1 | 1 | 84 | 2 | 12 | 0 |
| | 497 | 3 | 27 | 0 | 2 | 0 | 0 | 0 | 3 | 1 | 66 | 2 | 31 | 0 |
| W. Black Pine | 102 | 2 | 33 | 0 | 4 | 4 | 0 | 0 | 0 | 0 | 63 | 7 | 23 | 0 |
| | 505 | 4 | 18 | 0 | 3 | 7 | 0 | 0 | 0 | 1 | 48 | 10 | 35 | 1 |
| W. Cedar Hills | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| W. Stocker | 126 | 5 | 3 | 0 | 0 | 0 | 0 | 28 | 8 | 1 | 53 | 0 | 45 | 0 |
| Wight | 182 | 19 | 3 | 0 | 0 | 0 | 0 | 19 | 8 | 2 | 75 | 14 | 0 | 6 |

** depicts sites where data is not available.

APPENDIX G: 2014 PRODUCTION DATA

During the summer of 2014 production data was collected for a limited number of the pastures within the evaluation area where assessment information raised concern about current stocking rates verses available forage. A total of 4 to 5 plots were established within each of the pastures that were sampled. Fifty meter transects were established at each plot and ten production samples (9.6 m. hoops) were collected along each transect at 10 meter intervals. Instead of estimating the weights within the clipped plots, all plots were bagged, air dried and weighed.

The goal of gathering the data was to determine an estimated carrying capacity for specific pastures. Production was done on perennial grasses only. Total production of all available forage (shrubs, forbs, annuals) within each representative area and pasture would be higher than estimated.

Figure G-1: Location of 2014 production sampling sites within the evaluation area.

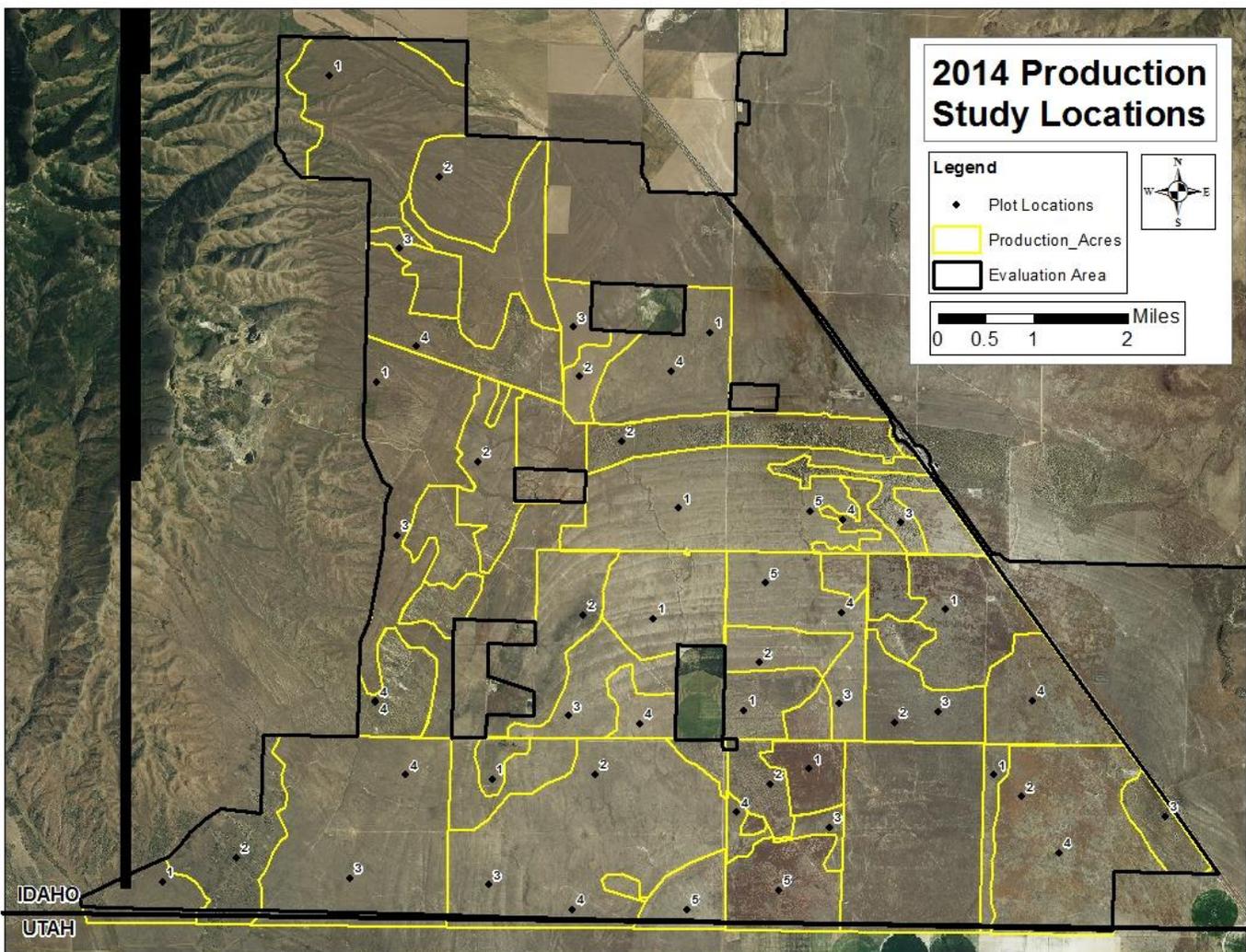


Table G-1: Production values by plot by pasture.

| PASTURE | PLOT NUMBER | AVERAGE LBS/AC |
|------------------|-------------|----------------|
| Antelope | 1 | 0 |
| | 2 | 2 |
| | 3 | 584 |
| | 4 | 487 |
| | 5 | 0 |
| Bowhuis | 1 | 536 |
| | 2 | 19 |
| | 3 | 517 |
| | 4 | 293 |
| | 5 | 838 |
| East Black Pine | 1 | 0 |
| | 2 | 207 |
| | 3 | 428 |
| | 4 | 388 |
| | 5 | 437 |
| North Black Pine | 1 | 395 |
| | 2 | 327 |
| | 3 | 459 |
| | 4 | 646 |
| North Brush | 1 | 382 |
| | 2 | 577 |
| | 3 | 550 |
| | 4 | 259 |
| South Black Pine | 1 | 271 |
| | 2 | 507 |
| | 3 | 500 |
| | 4 | 553 |
| | 5 | 192 |
| South Brush | 1 | 511 |
| | 2 | 258 |
| | 3 | 138 |
| | 4 | 253 |
| South Mills | 1 | 249 |
| | 2 | 707 |
| | 3 | 941 |
| | 4 | 141 |
| Van Koman North | 1 | 329 |
| | 2 | 974 |
| | 3 | 564 |
| | 4 | 215 |
| Van Koman South | 1 | 278 |
| | 2 | 524 |
| | 3 | 423 |
| | 4 | 123 |
| West Black Pine | 1 | 378 |
| | 2 | 85 |
| | 3 | 104 |
| | 4 | 112 |

Each pasture was divided into similar vegetative units based off aerial photography, and expert knowledge. Production results from sites collected in a mapped unit were applied to the entire unit. These smaller units were used to calculate the available AUMs for each pasture (Table H-2). An AUM was calculated at 900 lbs. of forage.

Calculations: (LBS/AC) x (ACRES) = TOTAL LBS
(TOTAL LBS) / 900 = TOTAL AUMS
(TOTAL AUMS) / 2 = AVAILABLE AUMS AT 50 % USE.

Table G-2: Production values by polygons by pasture.

| PASTURE | ACRES | LBS/AC | AVAILABLE AUMS | PASTURE AVAILABLE AUMS |
|-------------------------|-------|--------|----------------|------------------------|
| Antelope | 69 | 0 | 0 | 68 |
| | 326 | 0 | 0 | |
| | 296 | 2 | 0 | |
| | 30 | 0 | 0 | |
| | 100 | 489 | 27 | |
| | 125 | 587 | 41 | |
| Bowhuis | 1,689 | 536 | 503 | 772 |
| | 195 | 293 | 32 | |
| | 228 | 293 | 37 | |
| | 290 | 517 | 83 | |
| | 373 | 19 | 4 | |
| | 414 | 19 | 4 | |
| East Black Pine | 232 | 838 | 108 | 280 |
| | 896 | 418 | 208 | |
| | 384 | 1 | 0 | |
| | 344 | 207 | 40 | |
| | 136 | 207 | 16 | |
| North Black Pine | 142 | 207 | 16 | 560 |
| | 818 | 395 | 179 | |
| | 793 | 327 | 144 | |
| | 244 | 646 | 87 | |
| North Brush | 584 | 459 | 149 | 555 |
| | 880 | 382 | 187 | |
| | 610 | 564 | 191 | |
| | 134 | 382 | 28 | |
| | 209 | 382 | 44 | |
| South Black Pine | 723 | 259 | 104 | 914 |
| | 2,712 | 520 | 784 | |
| | 413 | 192 | 44 | |
| | 118 | 0 | 0 | |
| | 137 | 271 | 21 | |
| South Brush | 436 | 271 | 66 | 348 |
| | 1,789 | 269 | 267 | |
| | 295 | 138 | 23 | |
| South Mills | 203 | 511 | 58 | 640 |
| | 912 | 195 | 99 | |
| | 213 | 941 | 111 | |
| Van Koman | 210 | 707 | 83 | 2,087 |
| | 786 | 123 | 54 | |
| | 439 | 327 | 80 | |
| | 712 | 474 | 187 | |
| | 1,718 | 474 | 452 | |
| | 849 | 607 | 286 | |
| | 752 | 974 | 407 | |
| | 1,938 | 329 | 354 | |
| 383 | 564 | 120 | | |
| West Black Pine | 1,067 | 247 | 146 | 641 |
| | 1,391 | 271 | 209 | |
| | 567 | 450 | 142 | |
| | 561 | 150 | 47 | |
| | 105 | 450 | 26 | |
| | 869 | 450 | 217 | |

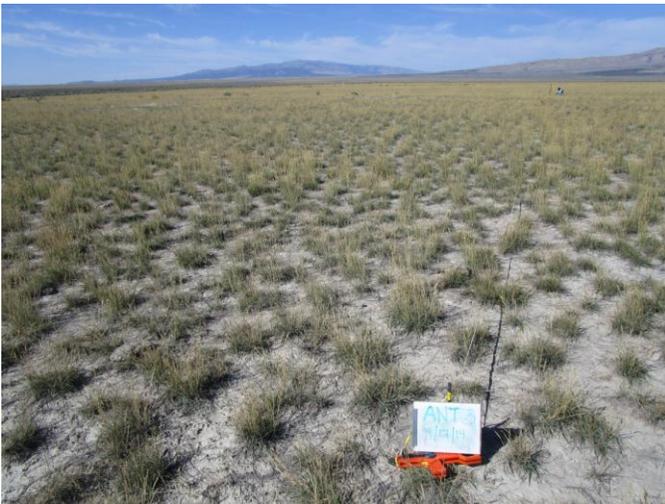
2014 Production Photos



ANTELOPE PLOT 1



ANTELOPE PLOT 2



ANTELOPE PLOT 3



ANTELOPE PLOT 4



ANTELOPE PLOT 5



BOWHUIS PLOT 1



BOWHUIS PLOT 2



BOWHUIS PLOT 3



BOWHUIS PLOT 4



BOWHUIS PLOT 5



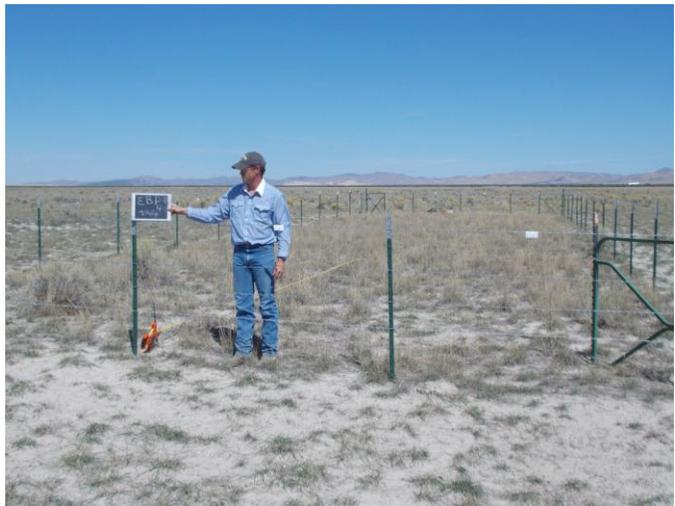
EAST BLACK PINE PLOT 1



EAST BLACK PINE PLOT 2



EAST BLACK PINE PLOT 3



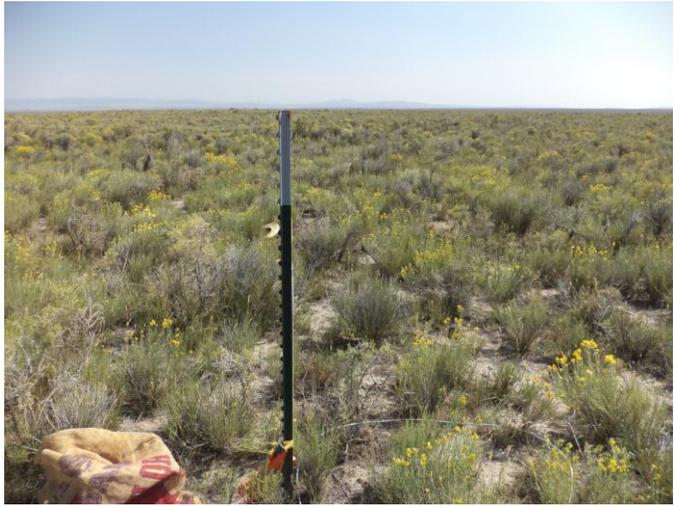
EAST BLACK PINE PLOT 4



EAST BLACK PINE PLOT 5



NORTH BLACK PINE PLOT 1



NORTH BLACK PINE PLOT 2



NORTH BLACK PINE PLOT 3



NORTH BLACK PINE PLOT 4



NORTH BRUSH PLOT 1



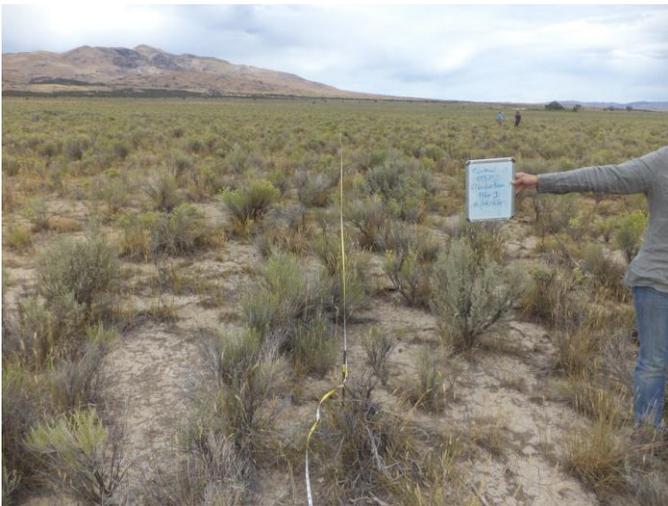
NORTH BRUSH PLOT 2



NORTH BRUSH PLOT 3



NORTH BRUSH PLOT 4



SOUTH BLACK PINE PLOT 1



SOUTH BLACK PINE PLOT 2



SOUTH BLACK PINE PLOT 3



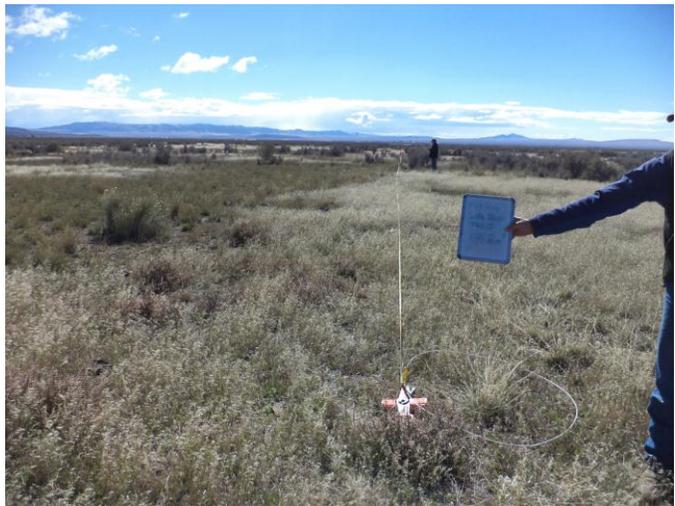
SOUTH BLACK PINE PLOT 4



SOUTH BLACK PINE PLOT 5



SOUTH BRUSH PLOT 1



SOUTH BRUSH PLOT 2



SOUTH BRUSH PLOT 3



SOUTH BRUSH PLOT 4



SOUTH MILLS PLOT 1



SOUTH MILLS PLOT 2



SOUTH MILLS PLOT 3



SOUTH MILLS PLOT 4



VAN KOMAN NORTH PLOT 1



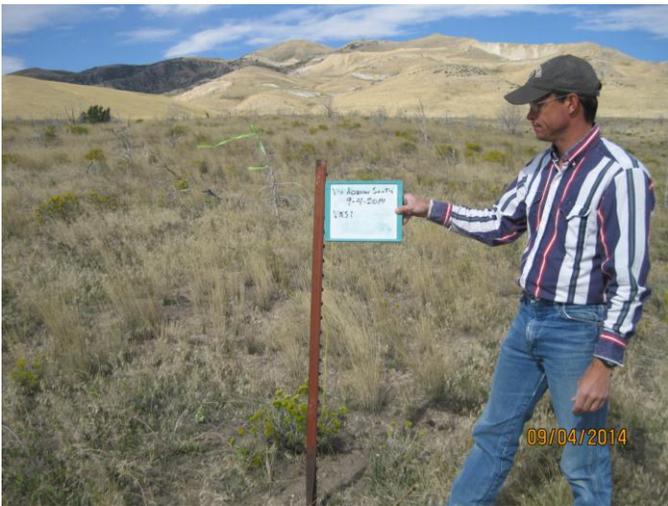
VAN KOMAN NORTH PLOT 2



VAN KOMAN NORTH PLOT 3



VAN KOMAN NORTH PLOT 4



VAN KOMAN SOUTH PLOT 1



VAN KOMAN SOUTH PLOT 2



VAN KOMAN SOUTH PLOT 3



VAN KOMAN SOUTH PLOT 4



WEST BLACK PINE PLOT 1



WEST BLACK PINE PLOT 2



WEST BLACK PINE PLOT 3



WEST BLACK PINE PLOT 4

Plot 3&4 within West Black Pine were not used to calculate production because livestock grazing had occurred prior to sampling. Sample sites in the adjacent South Black Pine Pasture were used instead. The sites used fell within the same vegetation type and had very similar vegetation composition and density based on comparative photos taken during monitoring over 10+ years.

APPENDIX H: ACTUAL USE INFORMATION

Actual Use and Grazing Capacities (AUMs) are presented in the Table. These values are presented for spring (S), summer (Sm) and fall (F) pastures. Curlew permittees submit Actual Grazing Use Reports (Form 4130-5) after grazing finishes each year. Where Actual Use reports were missing, licensed use was used to estimate actual use. Grazing capacities (AUMs) in column one (Pasture) is based on spring, fall and summer allocations made in the 1997 Final Decision and 2014 production data where available.

| Pasture | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|------------------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Antelope | Spring | 877 | 0 | 0 | 761 | 0 | 0 | 415 | 0 | 0 | 0 |
| | Fall | 0 | 0 | 0 | 0 | 459 | 180 | 0 | 0 | 0 | 473 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 877 | 0 | 0 | 761 | 459 | 180 | 415 | 0 | 0 | 473 |
| Bowhuis | Spring | 0 | 0 | 1363 | 0 | 0 | 1550 | 0 | 0 | 1188 | 0 |
| | Fall | 1676 | 61 | 0 | 1360 | 687 | 0 | 2410 | 160 | 180 | 1955 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 1676 | 61 | 1363 | 1360 | 687 | 1550 | 2410 | 160 | 1368 | 1955 |
| Cove | Spring | 0 | 1092 | 0 | 0 | 0 | 1069 | 0 | 1446 | 499 | 0 |
| | Fall | 0 | 0 | 610 | 0 | 0 | 0 | 696 | 0 | 0 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 0 | 1092 | 610 | 0 | 0 | 1069 | 696 | 1446 | 499 | 0 |
| Cove Burn | Spring | 0 | 766 | 0 | 0 | 776 | 0 | 286 | 935 | 0 | 0 |
| | Fall | 0 | 0 | 0 | 0 | 0 | 485 | 0 | 0 | 333 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 0 | 766 | 0 | 0 | 766 | 485 | 286 | 935 | 333 | 0 |
| Cow Hollow | Spring | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Fall | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Summer | 1420 | 1585 | 551 | 1676 | 1161 | 1751 | 1317 | 1615 | 2235 | 1840 |
| | Total | 1420 | 1585 | 551 | 1676 | 1161 | 1751 | 1317 | 1615 | 2235 | 1840 |
| Crazy Canyon | Spring | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Fall | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Summer | 2986 | 3489 | 3416 | 3382 | 2503 | 3454 | 3603 | 3790 | 3742 | 3625 |
| | Total | 2986 | 3489 | 3416 | 3382 | 2503 | 3454 | 3603 | 3790 | 3742 | 3625 |
| E Black Pine | Spring | 15 | 994 | 0 | 169 | 787 | 0 | 0 | 646 | 0 | 21 |
| | Fall | 30 | 0 | 786 | 0 | 0 | 1283 | 0 | 0 | 272 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 45 | 994 | 786 | 169 | 787 | 1283 | 0 | 646 | 272 | 21 |
| East Cedar Hill | Spring | 0 | 106 | 63 | 0 | 70 | 0 | 0 | 117 | 0 | 106 |
| | Fall | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 0 | 106 | 63 | 0 | 70 | 0 | 0 | 117 | 0 | 106 |
| East Stateline | Spring | 723 | 0 | 0 | 760 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Fall | 0 | 0 | 0 | 0 | 458 | 181 | 0 | 0 | 0 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 723 | 0 | 0 | 760 | 458 | 181 | 0 | 0 | 0 | 0 |
| East Stocker | Spring | 526 | 0 | 0 | 564 | 0 | 0 | 0 | 0 | 0 | 528 |
| | Fall | 0 | 535 | 0 | 0 | 154 | 0 | 535 | 503 | 0 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 111 | 0 | 0 | 0 | 0 | 0 |
| | Total | 526 | 535 | 0 | 564 | 265 | 0 | 535 | 503 | 0 | 528 |
| Glen Canyon | Spring | 127 | 126 | 116 | 118 | 294 | 282 | 128 | 96 | 116 | 121 |
| | Fall | 807 | 807 | 816 | 853 | 834 | 795 | 764 | 844 | 816 | 890 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 934 | 933 | 932 | 971 | 1128 | 1077 | 892 | 940 | 932 | 1011 |
| Grandine | Spring | 0 | 139 | 735 | 711 | 139 | 531 | 0 | 136 | 675 | 0 |
| | Fall | 340 | 0 | 0 | 0 | 0 | 117 | 495 | 0 | 0 | 318 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 69 | 0 |
| | Total | 340 | 139 | 735 | 711 | 139 | 648 | 495 | 136 | 744 | 318 |
| Grandine Pond | Spring | 104 | 0 | 97 | 97 | 0 | 133 | 136 | 0 | 136 | 136 |
| | Fall | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 140 | 0 | 97 | 97 | 0 | 133 | 136 | 0 | 136 | 136 |
| Haliday-1 | Spring | 0 | 756 | 0 | 0 | 428 | 0 | 0 | 605 | 0 | 0 |
| | Fall | 0 | 0 | 468 | 0 | 0 | 365 | 0 | 0 | 535 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 0 | 756 | 468 | 0 | 428 | 365 | 0 | 605 | 535 | 0 |
| Haliday-2 | Spring | 0 | 0 | 552 | 0 | 0 | 527 | 756 | 0 | 756 | 0 |
| | Fall | 475 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 532 |

| Pasture | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|----------------------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 475 | 0 | 552 | 0 | 0 | 527 | 756 | 0 | 756 | 532 |
| Holbrook Burn | Spring | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Fall | 563 | 0 | 35 | 0 | 0 | 0 | 0 | 615 | 0 | 545 |
| | Summer | 0 | 606 | 0 | 0 | 552 | 703 | 691 | 0 | 551 | 0 |
| | Total | 563 | 606 | 35 | 0 | 552 | 703 | 691 | 615 | 551 | 545 |
| Meadow Brook Divide | Spring | 0 | 0 | 0 | 0 | 0 | 0 | 413 | 0 | 0 | 0 |
| | Fall | 0 | 469 | 0 | 0 | 0 | 0 | 0 | 0 | 217 | 0 |
| | Summer | 449 | 0 | 465 | 0 | 0 | 0 | 0 | 441 | 124 | 451 |
| | Total | 449 | 469 | 465 | 0 | 0 | 0 | 413 | 441 | 341 | 451 |
| N Black Pine | Spring | 923 | 0 | 1143 | 788 | 0 | 969 | 1458 | 0 | 1280 | 0 |
| | Fall | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 986 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 923 | 0 | 1143 | 788 | 0 | 969 | 1458 | 0 | 1280 | 986 |
| North Bowen | Spring | 643 | 0 | 567 | 0 | 0 | 616 | 0 | 658 | 0 | 627 |
| | Fall | 0 | 0 | 0 | 0 | 370 | 0 | 0 | 0 | 0 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 643 | 0 | 567 | 0 | 370 | 616 | 0 | 658 | 0 | 627 |
| North Brush | Spring | 141 | 0 | 0 | 0 | 584 | 0 | 0 | 0 | 0 | 1403 |
| | Fall | 0 | 1247 | 0 | 0 | 0 | 917 | 0 | 1141 | 0 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 141 | 1247 | 0 | 0 | 584 | 917 | 0 | 1141 | 0 | 1403 |
| North Canyon | Spring | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Fall | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Summer | 1294 | 1306 | 719 | 0 | 1307 | 1282 | 1308 | 1074 | 1322 | 1294 |
| | Total | 1294 | 1306 | 719 | 0 | 1307 | 1282 | 1308 | 1074 | 1322 | 1294 |
| North Mills | Spring | 0 | 0 | 177 | 0 | 0 | 375 | 0 | 195 | 528 | 0 |
| | Fall | 209 | 0 | 0 | 0 | 0 | 0 | 404 | 0 | 0 | 404 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 209 | 0 | 177 | 0 | 0 | 375 | 404 | 195 | 528 | 404 |
| Pipeline | Spring | 0 | 0 | 321 | 0 | 0 | 220 | 174 | 0 | 0 | 0 |
| | Fall | 192 | 0 | 0 | 130 | 0 | 0 | 0 | 0 | 257 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 192 | 0 | 321 | 130 | 0 | 220 | 174 | 0 | 257 | 0 |
| Rest Stop | Spring | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 168 | 0 |
| | Fall | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 0 | 168 | 0 |
| Roe | Spring | 360 | 0 | 0 | 0 | 0 | 0 | 510 | 0 | 0 | 199 |
| | Fall | 0 | 179 | 328 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Summer | 0 | 0 | 0 | 187 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 360 | 179 | 328 | 187 | 0 | 0 | 510 | 0 | 0 | 199 |
| Section 24 | Spring | 0 | 0 | 170 | 0 | 0 | 226 | 72 | 0 | 276 | 0 |
| | Fall | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 0 | 0 | 170 | 0 | 0 | 226 | 72 | 0 | 276 | 0 |
| South Black Pine | Spring | 1023 | 0 | 531 | 1031 | 0 | 231 | 1350 | 0 | 0 | 882 |
| | Fall | 0 | 2243 | 0 | 0 | 1113 | 0 | 0 | 2205 | 0 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 1023 | 2243 | 531 | 1031 | 1113 | 231 | 1350 | 2205 | 0 | 882 |
| South Bowen | Spring | 0 | 739 | 0 | 0 | 553 | 0 | 0 | 0 | 719 | 0 |
| | Fall | 0 | 0 | 0 | 0 | 0 | 336 | 606 | 0 | 0 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 0 | 739 | 0 | 0 | 553 | 336 | 606 | 0 | 719 | 0 |
| South Brush | Spring | 0 | 0 | 935 | 0 | 0 | 0 | 896 | 0 | 590 | 0 |
| | Fall | 517 | 0 | 0 | 866 | 0 | 0 | 0 | 0 | 0 | 534 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 517 | 0 | 935 | 866 | 0 | 0 | 896 | 0 | 590 | 534 |
| South Mills | Spring | 0 | 485 | 0 | 0 | 455 | 0 | 0 | 214 | 0 | 0 |
| | Fall | 0 | 0 | 38 | 0 | 0 | 74 | 0 | 0 | 542 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 0 | 485 | 38 | 0 | 455 | 74 | 0 | 214 | 542 | 0 |
| Stone | Spring | 390 | 0 | 0 | 0 | 0 | 188 | 0 | 0 | 0 | 325 |
| | Fall | 0 | 180 | 314 | 6 | 345 | 11 | 0 | 371 | 49 | 0 |
| | Summer | 0 | 0 | 0 | 330 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 390 | 180 | 314 | 336 | 345 | 199 | 0 | 371 | 49 | 325 |
| Trail Canyon | Spring | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Fall | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Summer | 1575 | 1441 | 1650 | 1188 | 1291 | 1751 | 1318 | 1615 | 1201 | 1215 |
| | Total | 1575 | 1441 | 1650 | 1188 | 1291 | 1751 | 1318 | 1615 | 1201 | 1215 |
| Van Koman | Spring | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Pasture | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|------------------------|--------------|------------|-------------|------------|------------|-------------|-------------|-------------|-------------|-------------|------------|
| | Fall | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Summer | 912 | 1412 | 84 | 0 | 1245 | 1071 | 1846 | 1319 | 1182 | 817 |
| | Total | 912 | 1412 | 84 | 0 | 1245 | 1071 | 1846 | 1319 | 1182 | 817 |
| West Black Pine | Spring | 18 | 1176 | 0 | 46 | 826 | 0 | 0 | 1318 | 0 | 278 |
| | Fall | 0 | 0 | 936 | 46 | 0 | 980 | 0 | 0 | 1362 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 18 | 1176 | 936 | 92 | 826 | 980 | 0 | 1318 | 1362 | 278 |
| West Cedar Hill | Spring | 32 | 0 | 0 | 102 | 0 | 106 | 106 | 0 | 113 | 0 |
| | Fall | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 32 | 0 | 0 | 102 | 0 | 106 | 106 | 0 | 113 | 0 |
| West Stocker | Spring | 591 | 0 | 0 | 550 | 0 | 0 | 368 | 0 | 0 | 284 |
| | Fall | 0 | 393 | 0 | 0 | 430 | 0 | 0 | 404 | 0 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 591 | 393 | 0 | 550 | 430 | 0 | 368 | 404 | 0 | 284 |
| Wight | Spring | 0 | 596 | 0 | 0 | 351 | 0 | 0 | 504 | 0 | 0 |
| | Fall | 0 | 0 | 392 | 0 | 0 | 430 | 0 | 0 | 128 | 0 |
| | Summer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 0 | 596 | 392 | 0 | 351 | 430 | 0 | 504 | 128 | 0 |

APPENDIX I: 1997 GRAZING DECISION

Several permits have been transferred since the 1997 Decision was signed. The following table presents the 1997 Grazing decision with the current grazing permit holders represented and their permitted livestock numbers, season of use and authorized use.

| Permittee Group | Assigned Pastures | Permittee | Livestock Number & Kind | Season of Use | Authorized Use (AUMs) | | |
|--------------------------------------|---|------------------------|--|--|---|------------|-------|
| Black Pine A | E Black Pine S Mills W Black Pine <u>S Black Pine</u> N Black Pine Bowhuis Van Koman Trail Canyon <u>Cow Hollow</u> E Cedar Hills W Cedar Hills | Russell Boyer | 74 C 95 C | 4/16–10/31 5/1–10/31 | 484 575 | | |
| | | David Eliason | 50 C 452 C 231 C 445 C | 4/16–5/1 5/2–6/19 6/20–9/15 9/16–10/27 | 26 728 668 614 | | |
| | | Don C. Eliason | 158 C 179 C 407 C 407 C 63 C 70 C | 4/25–6/19 5/1–6/19 6/20–9/15 9/16–10/31 7/1–9/20 5/1–6/15 | 291 294 1178 616 170 106 | | |
| | | Timothy Keller | 153 C 144 C | 4/16–10/31 5/1–10/31 | 1001 872 | | |
| | | Jess Showell | 193 C 105 C 2 H | 4/16–10/31 5/1–10/31 4/16–11/15 | 1262 636 14 | | |
| | | Rick Steed | 109 C 60 C | 4/16–10/31 5/1–10/31 | 713 364 | | |
| | | Black Pine B | Holiday #2 N Mills <u>Pipeline</u> Holiday #1 <u>Wight</u> E Stocker <u>W Stocker</u> Crazy Canyon Glen Canyon | Bronson Sheep & Cattle Ltd. Co. | 1200 S | 5/12–7/10 | 395 |
| | | | | Tom & Vauna Wilcock | 199 C | 4/16-10/31 | 1,302 |
| Hank & Lacey Gem Higley (Ted Higley) | 279 C | | | 4/16-10/31 | 1,825 | | |
| Brandon Buttars | 155 C | | | 4/16-10/31 | 1,014 | | |
| Black Pine C | <u>S Brush</u> Section 24 <u>Cove</u> Antelope N Brush E Stateline Crazy Canyon | Rose of Snowville, LLC | 427 C 259 C 167 C 55 C 167 C 14 H | 4/16–10/31 5/1–10/31 5/1–6/15 6/16–8/30 8/31–10/31 4/16–11/15 | 2,795 1,567 253 137 340 93 | | |
| Holbrook | N Bowen <u>S Bowen</u> Meadow Divide <u>Holbrook Burn</u> N Canyon N1/2 N Canyon S 1/2 | Dallan & Cindy Nalder | 118 C | 4/16–9/30 | 652 | | |
| | | Shad & LaNae Nalder | 76 C | 4/16–9/30 | 420 | | |
| | | Kent & Pat Smith | 95 C | 4/16–9/30 | 524 | | |
| | | Kevin Smith | 66 C | 4/16–9/30 | 365 | | |
| Stone | <u>Cove Burn</u> Grandine <u>Grandine Pond</u> N Canyon N1/2 <u>N Canyon S1/2</u> Stone Roe | R. Anderson | 92 C | 4/16–5/30 | 136 | | |
| | | Rod Arbon | 19 C | 5/1–9/30 | 96 | | |
| | | TJ2 Arbon | 47 C | 5/1–9/30 | 236 | | |
| | | Alden Neal | 43 C | 4/16–9/30 | 238 | | |
| | | RV Neal Ranch | 170 C 2 H | 4/16–11/15 4/16–11/15 | 1,196 14 | | |
| | | Sid Showell | 73 C 2 H | 4/16–11/15 4/16–11/15 | 514 14 | | |
| | | Lyle Steed | 34 C | 4/16–9/30 | 188 | | |

APPENDIX J: REFERENCES

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