Rangeland Health Assessment

Small Allotment, No. 00188

Standards for Healthy Rangelands
and
Guidelines for Livestock Grazing Management
for
Public Lands administered
by the
Bureau of Land Management
in
Wyoming

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BLM

Worland Field Office, Wind River/Bighorn Basin District, Wyoming

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1.0 INTRODUCTION

The Bureau of Land Management (BLM) grazing regulations at 43 CFR 4130.3-1(c) require that grazing permits issued by the BLM contain terms and conditions that ensure conformance with BLM regulations at 43 CFR 4180, which are the regulations under which the Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for Public Land Administered by the Bureau of Land Management in the State of Wyoming were developed. Recently, the Worland Field Office completed an assessment of the achievement of these standards on the **Small Allotment, No. 00188**. The results of this assessment are presented in this report. This assessment will serve to inform the BLM's determination as to whether these standards are being met, and, if they are not met, whether existing grazing management practices contribute to their lack of attainment.

1.1 Standards

The approved standards for rangeland health are as follows:

Standard #1: Within the potential of the ecological site (soil type, landform, climate, and geology), soils are stable and allow for water infiltration to provide for optimal plant growth and minimal surface runoff.

Standard #2: Riparian and wetland vegetation has structural, age and species diversity characteristic of the state of channel succession and sis resilient and capable of recovering from natural and human disturbance in order to provide forage and cover, capture sediment, dissipate energy, and provide ground water recharge.

Standard #3: Upland vegetation on ecological site consists of plan communities appropriate to the site which are resilient, diverse, and able to recover from natural and human disturbance.

Standard #4: Rangelands are capable of sustaining viable populations and a diversity of native plant and animal species appropriate to the habitat. Habitats that support or could support threatened species, endangered species, species of special concern, or sensitive species will be maintained or enhanced.

Standard #5: Water quality meets State standards.

Standard #6: Air quality meets State standards

2.0 Affected Environment-Allotment Description, Resource Values, and Uses

2.1 Location and Land Ownership

Small Allotment consists of 1695 acres located ten miles north of Hyattville along the west side of Alkali Road (BLM Road 1111). The allotment occupies and altitudinal zone of 5900 to 6600 feet. Sixty-three percent of allotment acreage (1075acres) is Public Land; the remainder is owned by the grazing permittee.

2.2 Hydrology

2.2.1 Surface Water

The Small allotment is located on the west slopes of the Big Horn Mountains. The watersheds in the basin are mapped as United States Geological Survey (USGS) Level #6 watersheds that are also identified by name and Hydrologic Units Code or (HUC). The entire allotment (2.6 mi^2) is within the Alkali Creek watershed (HUC# 100800080608). The allotment has several confined and steep ephemeral drainages with narrow valley bottoms, when flowing, trend in southwestern direction through the allotment where they confluence with Alkali Creek that is located southwest of the allotment (**Map 3**). The allotment is located in the upper portions of the watershed and contains 6.2 percent of the total watershed area of Alkali Creek (Table #1). The allotment has thin soils with bedrock underneath that creates slightly higher amounts of runoff during precipitation events due to lack of infiltration.

Table 1: Watershed Area

Watershed (HUC) Level #6	mi^2	mi^2 Within Allotment	(%) of Watershed in the Allotment
Alkali Creek– (100800080608)	41.7	2.6	6.2

2.2.2 Ground Water

The area has surface outcrops of the Pennsylvanian Tensleep Formation that contains cross bedded sandstone outcrops that are considered important groundwater recharge areas due to the high storability and high permeability. The effective precipitation amount at higher elevations in the basin is greater than evaporation and transpiration and therefore is considered a recharge area. The Tensleep Formation is considered a deeper bedrock aquifer toward the center of the basin and does provide high quantities of water to wells throughout the region. The Tensleep Sandstone is a source for domestic and stock water in the Nowood River Watershed (Anderson Consulting, 2009).There is one minor seep area on private land in the center of the allotment in section 20.There is also a large significant spring outside of the allotment in the same watershed that is likely linked to groundwater recharge from the Tensleep Formation outcrops from this allotment. This spring is located 2.0 miles downstream and down slope of the allotment in section 36 of Township 51 North Range 90 West. This spring is located in the Chugwater Formation and provides perennial flow for Alkali Creek that provides for riparian habitat and water supply for irrigation.

2.2.3 Riparian Areas

According to the US Fish and Wildlife service wetlands geospatial coverage and field visits to the allotment there is a minor seep/spring that is 0.1 acre that is located on private land. This is used as a

livestock watering source for the allotment. There is likely enough subsurface water available for some limited Cottonwood communities that are present at some of the valley bottoms in the southern end of the allotment. There are no inventoried or other known riparian areas to occur on public land within the allotment.

2.3 Climate

Following is a generalized climate description prepared by the NRCS for the 10-14 inch east precipitation zone, applied to an altitudinal band surrounding the Big Horn and Wind River Basins of Wyoming.

> *Annual precipitation ranges from 10-14 inches per year. The normal precipitation pattern shows the least amount of precipitation in December, January, and February, increasing to a peak during the latter part of May. Amounts decrease through June, July, and August and then increase some in September. Much of the moisture that falls in the latter part of the summer is lost by evaporation and much of the moisture that falls during the winter is lost by sublimation. Average snowfall exceeds 20 inches annually. Wide fluctuations may occur in yearly precipitation and result in more dry years than those with more than normal precipitation.*
>
> *Temperatures show a wide range between summer and winter and between daily maximums and minimums, due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Cold air outbreaks from Canada in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Chinook winds may occur in winter and bring rapid rises in temperature. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring.*
>
> *Winds are generally not strong as compared to the rest of the state. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 75 mph.*
>
> *Growth of native cool-season plants begins about April 15 and continues to about July 15. Cool weather and moisture in September may produce some green up of cool season plants that will continue to late October.*
>
> *The following information is from the "Thermopolis 2" climate station:*
> *Minimum Maximum 5 yrs. out of 10 between*
> *Frost-free period (days): 74 149 May 23 – September 16*
> *Freeze-free period (days): 112 180 May 8 – October 1*
> *Annual Precipitation (inches): 7.6 21.9*
>
> *Mean annual precipitation: 12.35 inches*
> *Mean annual air temperature: 46.2 F (30.1 F Avg. Min. to 62.3 F Avg. Max.)*

The BLM maintains a series of rain gauges in several locations in the Big Horn Basin. These are read monthly, as climate permits. Two of these are located within three miles of Small Allotment and have recorded annual precipitation totals of 10.92 and 12.23 inches, of which a little less than half occurs during the growing season for the most important herbaceous plant species. From these it appears that Small Allotment lies near the midrange of the 10-14 inch precipitation zone.

2.4 Soils

The soils reflect the mountain environment in which they formed. They are highly variable, reflecting differences in parent material (sandstone, siltstone and/or mixed alluvium), position on the landscape, slope and aspect. Soil depth ranges from a few inches to over 60 inches. These soils typically have a light brown surface layer. Surface textures are fine sandy loams and loams. The subsoil often reflects an increase in clay, being expressed argillic horizons. Slopes range from 0 to 40 percent.

Based on the Soil Survey for Bighorn County, the dominant ecological sites found in the in the allotment are listed below:

Shallow Loamy 10-14 inch precipitation zone	R043BY322WY
Shallow Loamy 10-14 in. pz.	R043BY262WY
Sandy 5-9 in. pz. 10-14 in. pz.	R043BY350WY
Shallow Sandy 10-14 in. pz.	R043BY366WY
Very Shallow 10-14 in. pz.	R043BY376WY

One rangeland health assessment was conducted as part of this investigation. This assessment was conducted in Soil Map Unit 446 Spearfish-Travessilla. The soils at this location were a good fit for this complex. The test hole that was dug during the evaluation to verify the complex and was determined to be loamy of moderate depth. Other areas where rock outcrop was more noticeable would indicate a shallow loamy complex that is common in the eastern portion of the allotment. The parent material consisted of sandstone from the Ten Sleep Formation. The ecological site at the assessment location was a Loamy 10-14 in. pz. There were slightly elevated amounts of biological crusts that have developed in the area. The crusts are currently providing for stability and resistance to erosion.

Refer to the **Map 3** - Soil and Ecological Sites attached to this document.

2.5 Vegetation

Small Allotment occupies an altitudinal gradient of 700 feet which includes a juniper zone that lies as a band along the lower elevations of the Big Horn Mountains. Invasion by juniper has been problematic, and prescribed burns and mechanical treatments have taken place on the allotment to reduce both juniper and sagebrush.

The single transect location selected for determination of conformance with Standards for Rangeland Health was on a site identified as a "Loamy 10"-14" precipitation zone. Other significant allotment acreages are described as Sandy, Shallow Sandy and Very Shallow soils. Below are generalized plant community descriptions prepared by NRCS for these sites respectively, for the 10"-14" East (Big Horn Basin) precipitation zone:

<u>Loamy</u>

> *Potential vegetation on this site is dominated by mid cool-season perennial grasses. Other significant vegetation includes winterfat, big sagebrush, and a variety of forbs. The expected potential composition for this site is about 75% grasses, 10% forbs and 15% woody plants. The composition and production will vary naturally due to historical use, fluctuating precipitation and fire frequency.*
>
> *As this site deteriorates species such as blue grama, Sandberg bluegrass, and big sagebrush will*

increase. Plains pricklypear and weedy annuals will invade. Cool-season grasses such as Griffiths and bluebunch wheatgrass, rhizomatous wheatgrasses, needleandthread, and Indian ricegrass will decrease in frequency and production.

The ***Bluebunch Wheatgrass/Rhizomatous Wheatgrass*** *is considered to be the Historic Climax Plant Community (HCPC). This state evolved with grazing by large herbivores and periodic fires. The cyclical natural of the fire regime in this community prevented big sagebrush from being the dominant landscape. This plant community can be found on areas that are properly managed with grazing and/or prescribed burning, and on areas receiving occasional short periods of rest. The potential vegetation is about 75% grasses or grass-like plants, 10% forbs, and 15% woody plants. This state is dominated by cool season mid-grasses.*

The major grasses include Griffiths and bluebunch wheatgrasses, rhizomatous wheatgrasses, needleandthread, and Indian ricegrass. Other grasses occurring in this state include bottlebrush squirreltail, prairie junegrass, and Sandberg bluegrass. Big sagebrush is a conspicuous element of this state, occurs in a mosaic pattern, and makes up 5 to 15% of the annual production. Winterfat is a common component found on this site. A variety of forbs also occurs in this state and plant diversity is high....

The total annual production (air-dry weight) of this state is about 800 lbs./acre, but it can range from about 500 lbs./acre in unfavorable years to about 1100 lbs./acre in above average years.

Sandy

Potential vegetation on this site is dominated by mid cool-season perennial grasses. Other significant vegetation includes winterfat, big sagebrush, and a variety of forbs. The expected potential composition for this site is about 75% grasses, 15% forbs and 10% woody plants. The composition and production will vary naturally due to historical use, fluctuating precipitation and fire frequency.

As this site deteriorates, species such as threadleaf sedge, blue grama, and big sagebrush will increase. Plains pricklypear and weedy annuals will invade. Cool season grasses such as needleandthread, bluebunch and Griffith's wheatgrasses, Indian ricegrass, and rhizomatous wheatgrasses will decrease in frequency and production.

The ***Needleandthread/ Indian Ricegrass*** *plant community is considered the Historic Climax Plant Community for this site. This state evolved with grazing by large herbivores and periodic fires. The cyclical natural of the fire regime in this community prevented big sagebrush from being the dominant landscape. This plant community can be found on areas that are properly managed with grazing and/or prescribed burning, and on areas receiving occasional short periods of rest. The state is comprised of mostly cool season mid-grasses and a variety of forbs and woody species. Potential vegetation is about 75% grasses or grass-like plants, 15% forbs, and 10% woody plants.*

The major grasses include needleandthread, Indian ricegrass, bluebunch and/or Griffith's wheatgrasses, and rhizomatous wheatgrasses. Other grasses occurring in the state include prairie junegrass, Sandberg bluegrass, blue grama, threadleaf sedge, and bottlebrush squirreltail. Spikefescue occurs on sites in the higher precipitation ranges of this zone. Big sagebrush and winterfat are conspicuous components of this state. A variety of forbs also occurs

in this state and plant diversity is high (see Plant Composition Table).

The total annual production (air-dry weight) of this state is about 800 lbs./acre, but it can range from about 500 lbs./acre in unfavorable years to about 1100 lbs./acre in above average years.

Shallow Sandy

Potential vegetation on this site is dominated by mid cool-season perennial grasses. Other significant vegetation includes winterfat and a variety of forbs and shrubs. The expected potential composition for this site is about 75% grasses, 10% forbs and 15% woody plants. The composition and production will vary naturally due to historical use, fluctuating precipitation and fire frequency.

As this site deteriorates, species such as threadleaf sedge, blue grama, and big sagebrush will increase. Plains pricklypear and weedy annuals will invade. Cool season grasses such as needleandthread, bluebunch and Griffith's wheatgrasses, and Indian ricegrass will decrease in frequency and production.

The ***Indian ricegrass/ Bluebunch Wheatgrass*** *plant community is considered to be the Historic Climax Plant Community for this site. This state evolved with grazing by large herbivores, soils less than 20 inches in depth, and periodic fires. The cyclical nature of the fire regime in this community prevented sagebrush from being the dominant landscape. Cool season midgrasses dominate the state. Potential vegetation is about 75% grasses or grass-like plants, 10% forbs, and 15% woody plants. It is found on areas that are properly managed with grazing and/or prescribed burning, and sometimes on areas receiving short periods of rest.*

The major grasses include Indian ricegrass, bluebunch and Griffith's wheatgrasses, needleandthread, and rhizomatous wheatgrasses. Other grasses occurring in the state include prairie junegrass, Sandberg bluegrass, and threadleaf sedge. Green needlegrass and spikefescue occur on sites in the higher part of this precipitation zone. Big and black sagebrushes and winterfat are conspicuous components of this state. Skunkbush sumac may also be present on sites in the lower portion of this precipitation zone. A variety of forbs and shrubs also occur in this state and plant diversity is high ....
The total annual production (air-dry weight) of this state is about 500 pounds per acre, but it can range from about 350 lbs./acre in unfavorable years to about 700 lbs./acre in above average years.

Very Shallow

Potential vegetation on this site is dominated by a variety of mid cool-season perennial grasses. Other significant vegetation includes winterfat and a variety of forbs and shrubs. The expected potential composition for this site is about 70% grasses, 10% forbs and 20% woody plants. The composition and production will vary naturally due to historical use, fluctuating precipitation and fire frequency.

As this site deteriorates, species such as short warm-season grasses, juniper, and shrubs will increase. Plains pricklypear and weedy annuals will invade. Cool season grasses such as bluebunch wheatgrass will decrease in frequency and production.

The ***Bluebunch Wheatgrass/ Needleandthreead*** *plant community is the Historic Climax Plant*

Community for this site. This state evolved with grazing by large herbivores and droughty soils due to the limited water holding capacity. Fire, although rare due to the sparseness of the vegetation is a component of this plant community. This plant community can be found on areas that are properly managed with grazing and on areas receiving occasional short periods of rest. Potential vegetation is about 70% grasses or grass-like plants, 10% forbs, and 20% woody plants. Cool season mid-grasses dominate the state.

The major grasses include bluebunch and/or Griffith's wheatgrasses, prairie junegrass, Indian ricegrass, and needleandthread. Other grasses and grasslikes occurring on the site include rhizomatous wheatgrasses, bottlebrush squirreltail, Sandberg bluegrass, Fendler threeawn, blue grama, and threadleaf sedge. Shrubs most commonly found are black and Wyoming big sagebrush, green and rubber rabbitbrush, winterfat, and juniper. Curl-leaf mountainmahogany is also a major shrub along the western slopes of the Bighorn mountains but does not occur in the Wind River Basin or along the slopes of the Owl Creek and Absaroka mountain ranges. Antelope bitterbrush and limber pine are very common on sites in the upper precipitation range of this zone. A variety of forbs can be present and plant diversity is high....

The total annual production (air-dry weight) of this state is about 350 pounds per acre, but it can range from about 250 lbs./acre in unfavorable years to about 500 lbs./acre in above average years.

2.6 Invasive Species

Small Allotment drains to Alkali Creek. Canada thistle and Russian olive have been documented along Alkali Creek, although not on Small Allotment.

2.7 Range

Small Allotment is an "I" category allotment. It is not included in an allotment management plan but is used in a sequence with several nearby allotments operated by the same permittee. Permitted use is as follows:

6 horses	4/16-5/15	54% Public Land	3 AUMs
95 cattle	5/04-6/30	54%	98
190 cattle	11/06-11/09	54%	13
			114 AUMs

Horses have not grazed the allotment for several years. Late season use is only as a holding pasture as livestock are brought down from other allotments on their way home.

Livestock water is available almost exclusively from a spring on private land near the center of the allotment. A few other seeps occasionally have water but are of minor use because of their size and location. The allotment is rough and dissected by canyons, and varies in elevation by 700 feet. Livestock distribution is accordingly inhibited.

In April, 1999 a prescribed burn was conducted on the allotment. Sagebrush was the targeted fuel and 150 acres were blackened. Later that year a minor acreage of juniper was burned. In 2009 a small amount of junipers were removed by mechanical means.

The allotment is permitted at 8 acres/AUM. During the period 2005-2010 livestock use has been at fifty percent of permitted use, i.e. use has been at 16 acres/AUM. The beginning use date for cattle on the permit is 5/04. During past five years the average beginning use date has been June 15th, for an average use period of twenty days.

2.8 Wildlife

This allotment provides habitat for several big game species, as well as other non- game and special status wildlife species, during various seasons of the year. The allotment is predominantly rolling sagebrush grasslands with minor amounts rock outcroppings. The south and west sides of the allotment have mixed juniper, limber pine, and curl leaf mountain mahogany communities. These wooded portions of the allotment are predominately deeply incised drainages or canyons with abundant rim rock and steep slopes/cliffs. There are some cottonwood/willow communities in the drainage bottoms. There is one developed spring with associated pond on private land within the allotment. Two other springs exist on public land in canyon bottoms.

The mix of vegetative communities and typography provides habitat for a variety of wildlife species during various times of the year. It is classified as crucial winter elk range, deer yearlong and crucial winter range, and antelope yearlong range. Based on observations of pellet groups, elk and deer use the allotment heavily during the winter. Some deer are yearlong residents, but all of the elk and most of the deer move to higher elevations as snow melts. Antelope use the allotment, but not as heavily as adjoining allotments to the north and east.

Other game animals present on the allotment include cottontail rabbits, chukars and gray partridge, Common species like the badger, bobcat, coyote, a variety of small mammals, passerines, and raptors inhabit this allotment as well.

2.9 Threatened or Endangered Species

2.9.1 Threatened, Endangered, Candidate, and BLM Sensitive Species -- Wildlife

The entire allotment is within a sage grouse core area. There are no recorded sage-grouse leks within the allotment, but a possible lek site was found during a survey of the allotment. It will be checked during the spring of 2011 for confirmation. An active lek exists within 0.5 mile of the allotment boundary. The remains of a sage-grouse nest were found near the potential lek site. A widespread survey of sagebrush areas found few sage-grouse pellet groups outside the potential lek site.

The sagebrush habitat also provides breeding, nesting and foraging habitat for other sagebrush obligate bird species like the sage thrasher, Brewer's sparrow and loggerhead shrike. Although they have not been documented through formal inventory efforts, these are BLM sensitive species that are common residents of these sagebrush communities in the area. The Ferruginous hawk is a BLM sensitive species likely to inhabit this allotment. In the absence of any site-specific management plans or conservation strategies for these sensitive species, the Land Health Standards provide for the management of their habitats. These sagebrush habitats comprise approximately 60% of the allotment.

2.9.2 Threatened, Endangered, Candidate, and BLM Sensitive Species – Plants

Threatened and endangered or otherwise sensitive plants are not known to be present on Small Allotment.

3.0 Summary of Monitoring/Assessment Data

3.1 Range

On July 28th, 2010 100-foot line intercept transects were run in Small Allotment in T. 51 N., R. 89 W., Sec. 20:SW¼SW¼, and T. 51 N. R. 89 W., Sec. 20: SENW. Live big sagebrush canopy cover was determined to be 21% and 16% respectively. The location of the first transect was near the location of the transect where the Rangeland Health Assessment described below was conducted.

A Rangeland Health Assessment was completed on a single location on Allotment 00188 on August 27th, 2010 using the *"Interpreting Indicators of Rangeland Health"*, Technical Reference 1734-6, Version 4. The transect was located on a Loamy 10 - 14 inch precipitation range site.

Data was collected from a 200-foot line intercept transect and a rangeland health assessment using the 17 indicators of rangeland health criteria. Transect data resulted in the following figures:

Table 2

Vegetative Cover	Litter	Bare Ground	Sagebrush Canopy Cover
60%	15%	25%	21%

Bluebunch wheatgrass was the most abundant herbaceous species encountered, located at 25 of the 100 points on the transect.

Ratings for each of the seventeen indicators of rangeland health are displayed in the table below:

Indicator	Departure from Reference
1. Rills	*none*
2. Water Flow Patterns	*Slight to moderate*
3. Pedestals and/or Terracettes	*Slight to moderate*
4. Bare Ground	*Slight to moderate*
5. Gullies	*Slight to moderate*
6. Wind- Scoured, Blowouts, and /or Deposition Areas	*none*
7. Litter Movement	*Slight to moderate*
8. Soil Surface Resistance to Erosion	*Slight to moderate*
9. Soil Surface Loss or Degradation	*Slight to moderate*
10.Plant Community Composition and Distribution Relative to Infiltration	*Slight to moderate*
11. Compaction Layer	*none*
12. Functional/Structural Groups	*None to slight*
13. Plant Mortality/Decadence	*None to slight*
14. Litter Amount	*Slight to moderate*
15. Annual Production	*Slight to moderate*
16. Invasive Plants	*None to slight*
17. Reproductive Capability of Perennial Plants	*None to slight*

3.2 Hydrology/Riparian

During the field visit to the assessment site for rangeland health, the hydrologic indicators an overall slight to moderate departure for the presence of rills, bare ground, gullies, and plant community and composition relative to runoff. There was evidence of water flow patterns that were observed around rock outcrops and bunch grasses, this is due to a lack of infiltration and accelerated runoff where rock outcrops naturally occur along with some historical soil loss and erosion. The amount of bare ground (25%) is within acceptable limits for healthy rangelands and provides for sufficient vegetative and litter cover to provide for proper infiltration of moisture and minimize surface runoff on the allotment. There does appear to have some amounts of historical soil loss as evidenced by slight to moderate departure for the hydrologic and soil characteristics in the soil profile. The amounts of litter and cover to dissipate energy from rainfall impact and provide for protection of soil canopy to allow for proper infiltration. The slight to moderate departure of all the hydrologic indicator groups indicate minor amounts of historic degradation has likely occurred. There are no riparian areas inventoried in the allotment on public land.

3.3 Soil and Site Stability

As part of this investigation, one (1) rangeland health determination was conducted on September 2, 2010. Standard 1 for Healthy Rangelands was evaluated based on the attribute ratings for *Soil and Site Stability* and *Hydrologic Function* using rangeland health indicators 1-11 and 14. Field observations were compared to the Reference Sheet dated 5/1/2008 for the Loamy "10-14" precipitation zone ecological site (R032XY322WY) to determine departure from normal.

No rills were observed. Several water flow patterns that were 5-6' in length were found to be occurring on 7 percent slopes that were common in the allotment. There are several small depressions that are associated with the shallow sites and surface bedrock outcrops. These areas likely have higher amounts of surface runoff due to less infiltration capacity of shallow soils. The amount of bare ground was found to be 25 percent of the total cover. Litter cover was only 15 percent and is low and not very dense there is likely a slight reduction in the plant community and composition relative to runoff. Biological crusts account for a significant portion of the ground cover (8 percent). No wind-scour areas were observed. The litter movement was a few inches in the interspaces between the plants. The pedestals on the sage brush were 1-2 inches and are common for slopes of 7 percent. Using the bottle cap test to determine resistance to erosion on samples where 3 samples disintegrated, 2 were stable and 1 melted after tests. The annual production is on the low range but within limits of expected production for the site.

Based on the observations discussed above the attribute rating for *Soil and Site Stability* and *Hydrologic Function* were rated as "Slight to Moderate".

4.0 Conclusions

This section draws conclusions and makes determinations regarding:

A. Progress towards or attainment of the standards for rangeland health, and
B. Whether livestock management is in conformance with the guidelines, and
C. Whether existing grazing management or levels of grazing use are significant factors in failing to achieve the standards or conform to the guidelines.

4.1 Standard 1

Within the potential of the ecological site (soil type, landform, climate, and geology), soils are stable and allow for water infiltration to provide for optimal plant growth and minimal surface runoff. ***MET***

Rationale:
This allotment is in similar condition to adjacent allotments. The attribute ratings for *Soil and Site Stability* and *Hydrologic Function* were rated as "Slight to Moderate". The soil surface is stable and does not readily slake or disperse in water. Vegetative and litter cover are adequate to protect the soil from rain drop impact and the erosive forces of overland flow; however soil and site stability are very dependant of biological soil crusts. Erosion indicators are not strongly expressed, although historic water flow patterns have developed on steeper slopes. The amount of soil loss as evidenced by pedestals is similar to adjacent sites. No gullies were observed. The "well defined" channels have formed over shallow soils and are directly associated with large sandstone outcroppings. Though these channels could represent historic soil loss, they are stable and are part of the modern landscape. A shallow soil pit revealed a 6 inch horizon; there is no of historic soil loss. This same excavation did not reveal evidence of soil compaction.

4.2 Standard 2

Riparian and wetland vegetation has structural, age and species diversity characteristic of the state of channel succession and is resilient and capable of recovering from natural and human disturbance in order to provide forage and cover, capture sediment, dissipate energy, and provide ground water recharge. ***NOT APPLICABLE***

Rationale:
There is one spring on the allotment that is located on private land. There are no other inventoried riparian or wetlands that occur on public land within the allotment. There is also no historical evidence of any historical riparian areas that may have been converted to dry upland areas. Therefore this standard is not applicable for this allotment.

4.3 Standard 3

Upland vegetation on ecological site consists of plan communities appropriate to the site which are resilient, diverse, and able to recover from natural and human disturbance. ***MET***

Rationale:
The attribute rating for biotic integrity was "slight to moderate" (divergence from standards) on the transect location. This is a composite rating of nine of the seventeen indicators evaluated. Compared to standards for this site, the following criteria were rated as "none to slight" (divergence from standards): compaction layer, functional/structural groups (regarding plant community composition), plant mortality/decadence, invasive plants, and reproductive capability

of perennial plants. Four other criteria were rated as exhibiting "slight to moderate" divergence from standards. These were: soil surface resistance to erosion, soil surface loss or degradation, litter amount, and annual production.

Upland vegetation at the transect location is appropriate to the site. As noted in **3.1** above, vegetative cover along the transect was 60%. More than sixty percent of herbaceous intercepts along the transect included bluebunch wheatgrass, a grazing-sensitive, high seral stage species.

4.4 Standard 4

Rangelands are capable of sustaining viable populations and a diversity of native plant and animal species appropriate to the habitat. Habitats that support or could support threatened species, endangered species, species of special concern, or sensitive species will be maintained or enhanced. ***MET***

Rationale:
Data that pertains to this standard include: apparent trend, percent ground point cover, line intercept shrub canopy cover, presence of sage-grouse leks, and ocular surveys.

There is one active sage-grouse lek identified near (0.35 mile) this allotment, Alkali Road W-20-4 on State of Wyoming Trust land. Evidence of sage-grouse nesting has been found and brood rearing is likely occurring as well.

A representative key area transect location was chosen in the allotment to monitor and measure soil and vegetative parameters, and to conduct the evaluation of the 17 indicators of rangeland health. The transect location was in the south central part of the allotment. This location was within elk and mule deer and crucial winter range and antelope year long range. The location was within 1 mile or less of an active sage-grouse lek and with 0.5 mile of a suspected lek. Sagebrush canopy cover measured at this transect was 21which is within the range of sagebrush canopy covers anticipated for sage-grouse winter habitats for Wyoming. For the Standards and Guides field evaluations, plant community composition and distribution as well as the functional structural groups (indicator #s 10 and 12) were found to be a slight to moderate deviation from those anticipated. The Biotic Integrity rating was Slight to Moderate deviation from expected of the site in excellent condition. The Small Pasture Allotment is providing wildlife forage and cover needs; and is capable of sustaining viable populations of a diverse guild of native plant and animal species.

4.5 Standard 5

Water quality meets State standards. ***UNKNOWN***

Rationale:
The input to live perennial surface water from drainages through allotment is minimal. There is no perennial or intermittent flow that occurs in the allotment. The drainages are ephemeral and therefore are not considered for listing and not listed on the Wyoming DEQ 2008 305(b) Integrated State Water Quality Assessment Report and 2008 303 (d) List of Waters Requiring TMDLs.

Many studies have documented the effects of heavy grazing on riparian vegetation and soil erosion rates, but few studies have directly assessed impacts on water quality. Potential management impacts to water quality from rangelands as outlined in (Binkley, 1993) such as: excessive livestock waste production, resource extraction, stream channel modification, bank erosion from floods, erosion following wildfires, or erosion from overgrazing in uplands are not present in this allotment. The upland conditions indicated slight to moderate departure for rangeland health standards that is likely sufficient to avoid detrimental impacts to the water quality of storm water runoff following storm events. There is no BLM, USGS, or other state agency water quality data for these segments. Therefore compliance with Wyoming State Water Quality Standards is unknown, but nothing within available data indicates Standard Number 5 is not being met.

4.6 Standard 6

Air quality meets State standards. ***UNKNOWN***

Rationale:
No information is currently available to indicate whether or not this standard is being met. An air quality monitoring station was recently established in the Bighorn Basin, but no monitoring data is available at this time. Until specific data becomes available, the determination for this standard is UNKNOWN, per direction from the BLM Wyoming State Office.

5.0 REFERENCES

Anderson Consulting Engineers, 2009. Nowood River Storage/Watershed Study Final Report. Wyoming Water Development Commission. p. 3.72.

Binkley, D., Brown, T. 1993.Management Impacts on Water Quality of Forests and Rangelands. USDA Forest Service. General Technical Report RM-239. pp 5-6.

BLM 1998. Riparian Area Management. A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas. Technical Reference 1737-15.

DEQ, 2008. Wyoming's 2008 305(b) Integrated State Water Quality Assessment Report .p 28. http://deq.state.wy.us/wqd/events/public%20notices/2008%20Draft%20305_b_.pdf

Hedman, E.R. Osterkamp, W.R. 1982. Streamflow characteristics Related to Channel Geometry of Streams in Western United States. U.S Geological Survey Water Supply Paper 2193. pp12-13.

6.0 Resource Specialist Signatures

X _____

Rangeland Management Specialist

X _____

Supervisory Rangeland Management Specialist

X _____

Wildlife Biologist

X _____

Natural Resource Specialist, Weed Coordinator

X _____

Hydrologist

X _____

Other AFM. Resources

X _____

Natural Resource Specialist, Soils

X _____

Other_____

7.0 DETERMINATION

Based on information provided in this assessment, ***I have determined <u>that all standards are being met</u> and current livestock grazing is in conformance with the standards.***

X Michael G Valle

Karla Bird
Field Manager, Worland Field Office

for Acting

Based on the information provided in this assessment, ***<u>I have determined that all of the standards are NOT being met</u> but that <u>livestock grazing is in conformance</u> with the standards.***

X

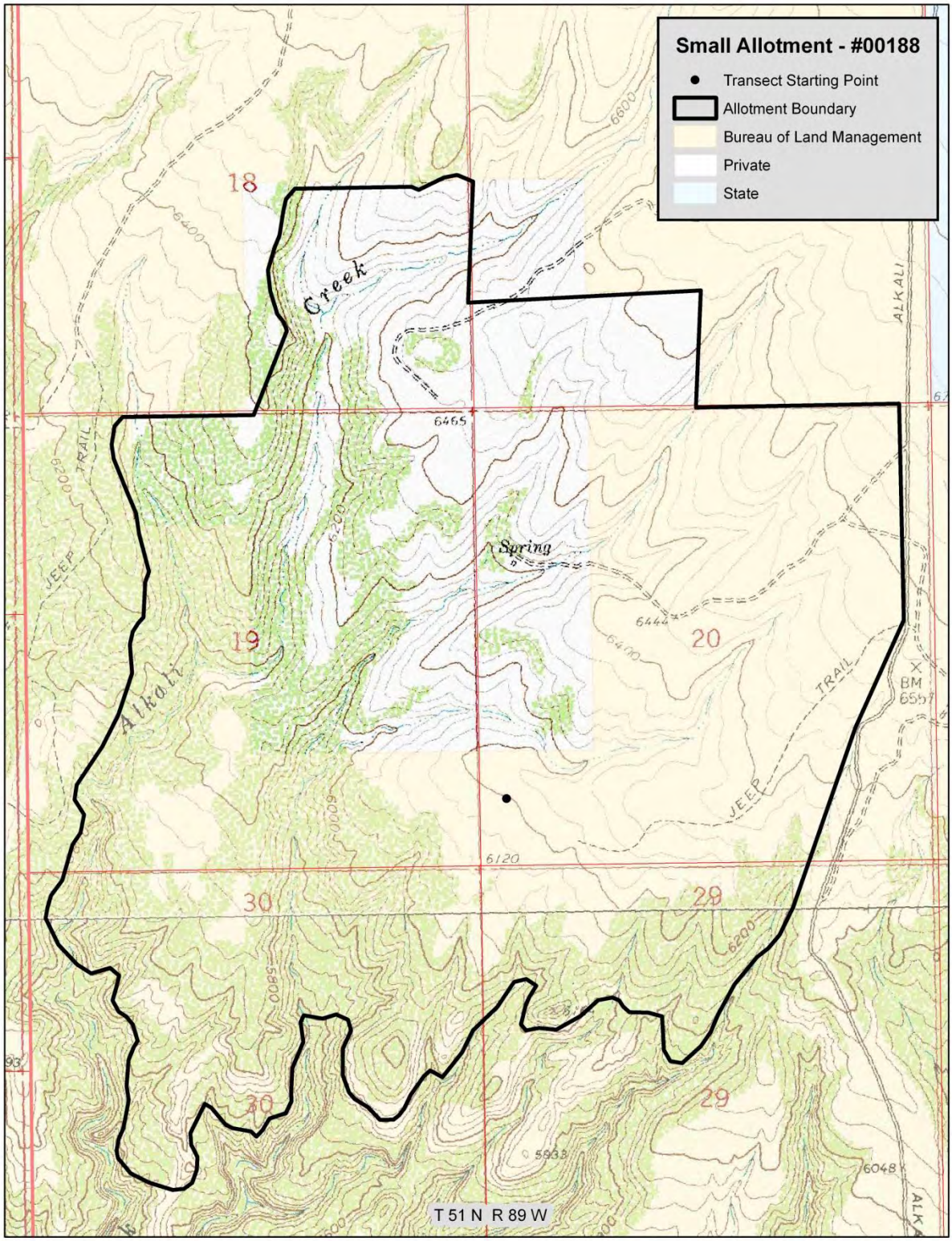
Karla Bird
Field Manager, Worland Field Office

Based on the information provided in this assessment, ***I have determined that all of the standards are <u>NOT</u> being met and that livestock grazing <u>is NOT</u> in conformance with the standards.***

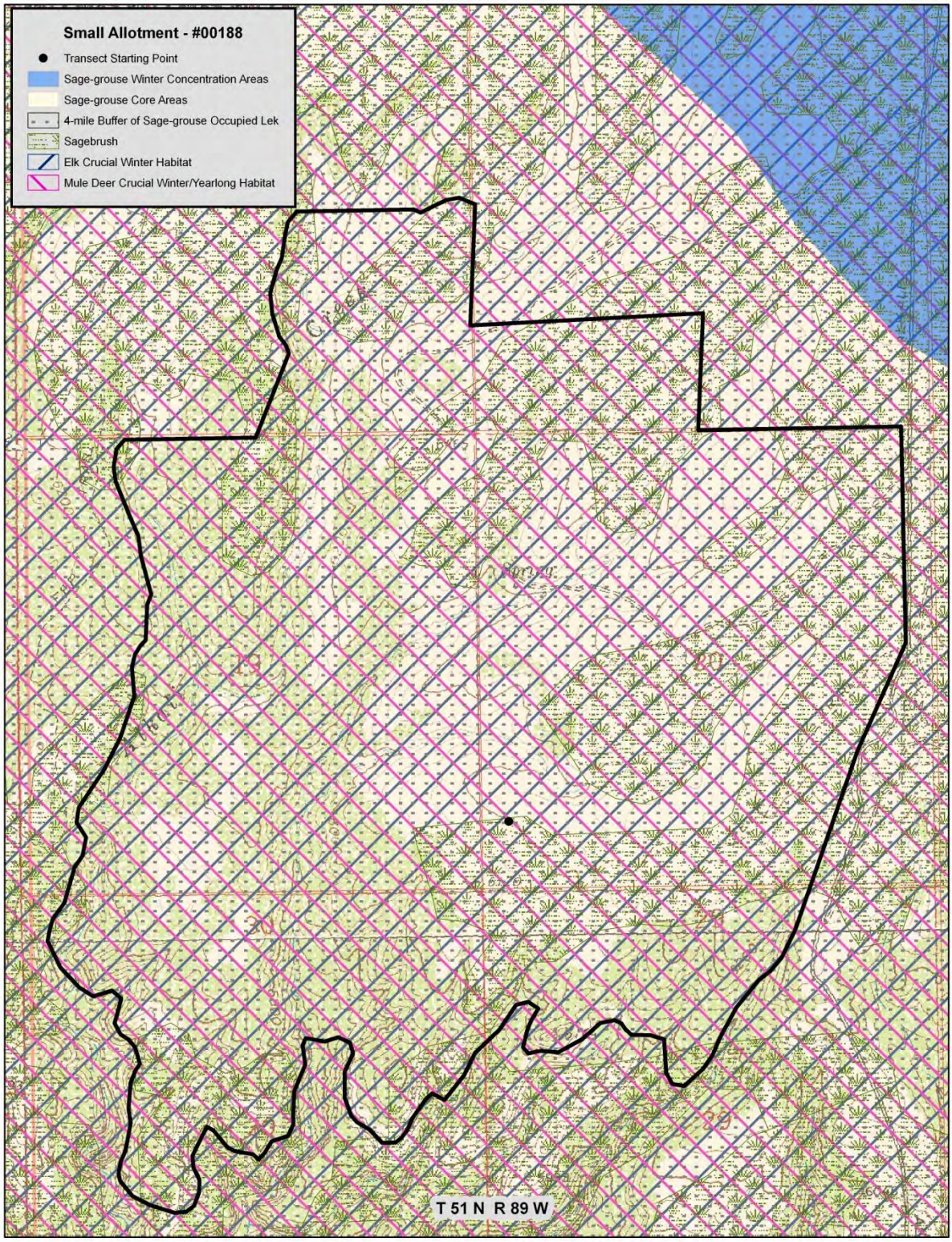
X

Karla Bird
Field Manager, Worland Field Office

Map 1: Allotment Map with Transect/Assessment Location

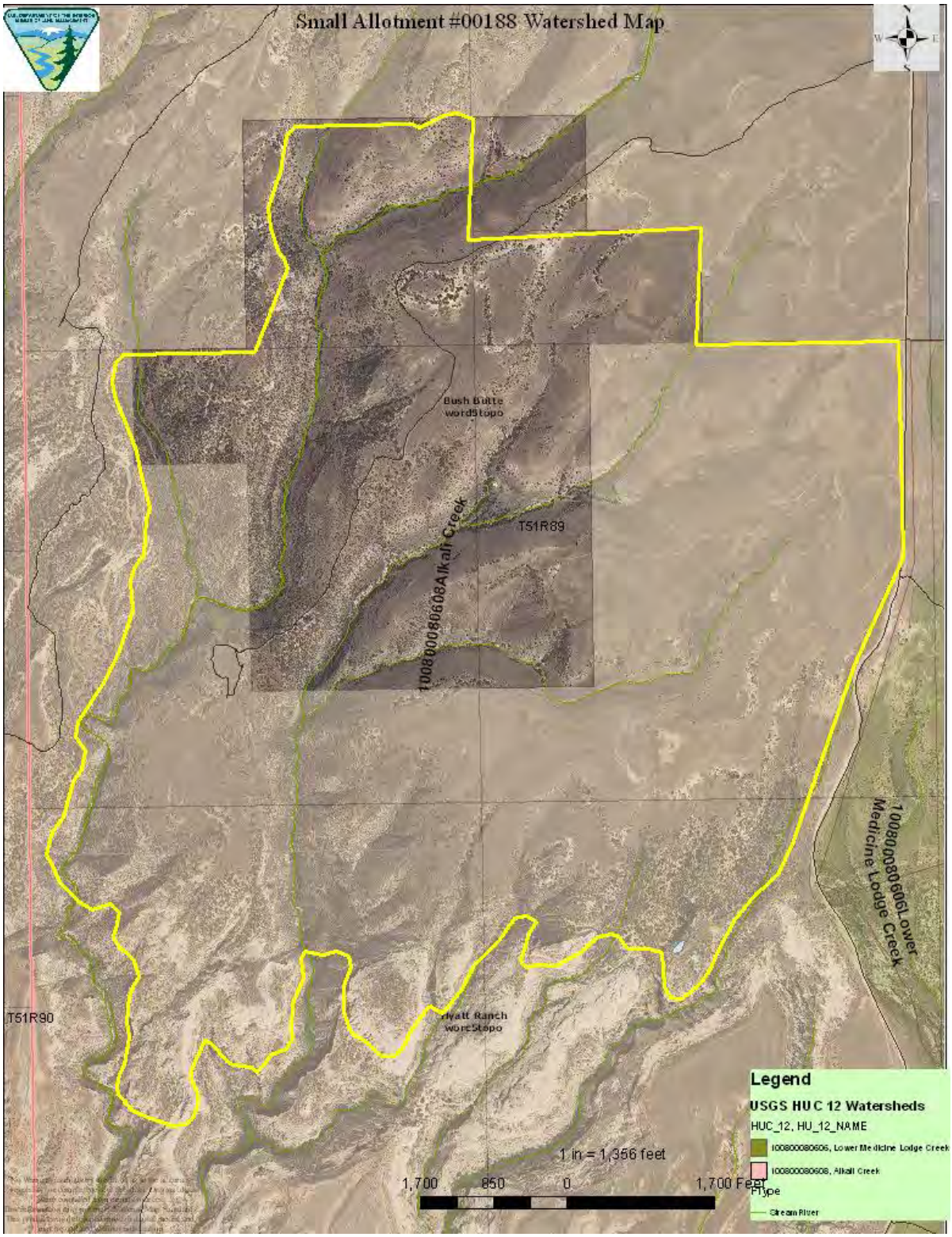


Map 2: Wildlife

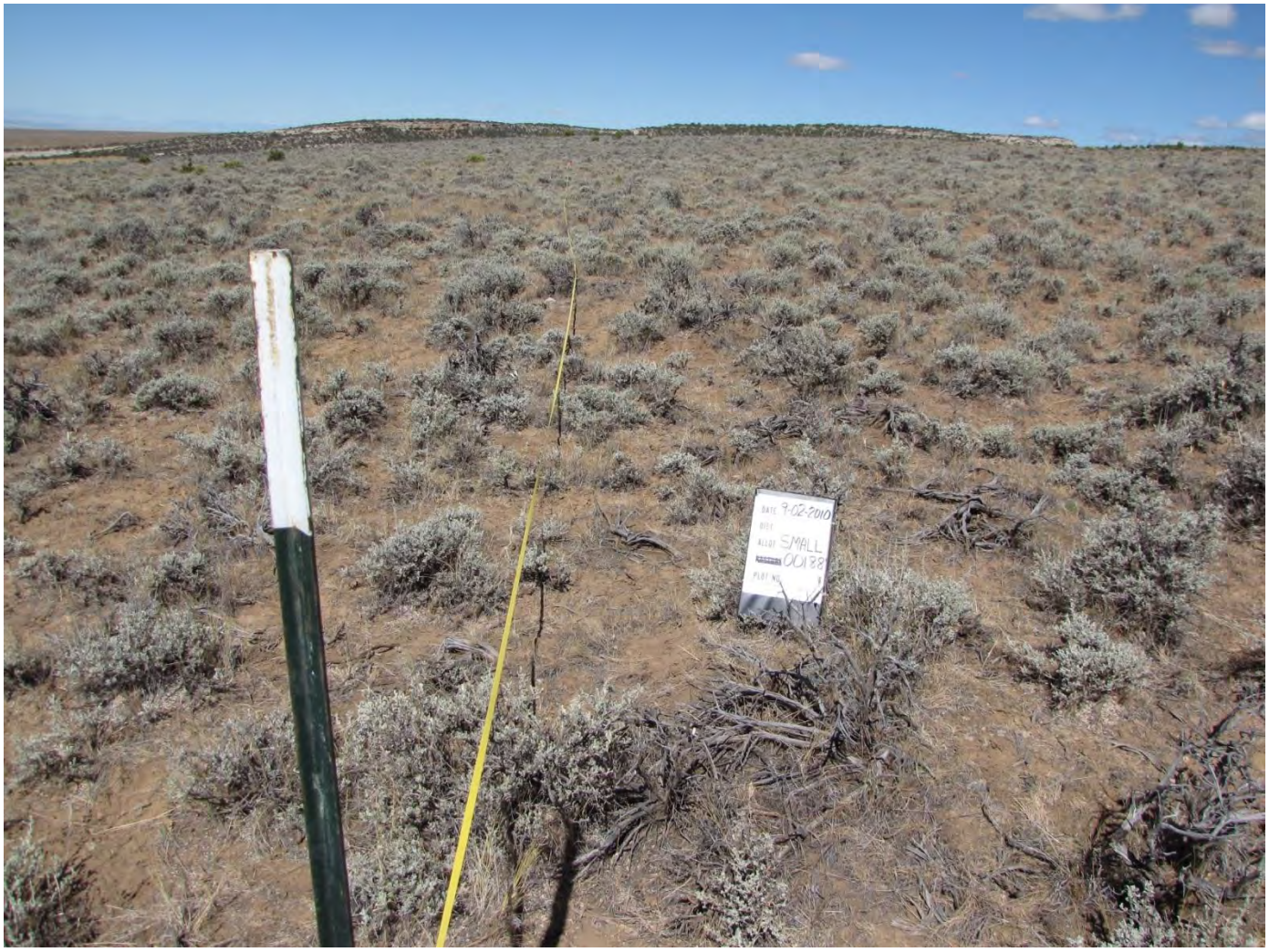


Map 3: Soils and Ecological Sites

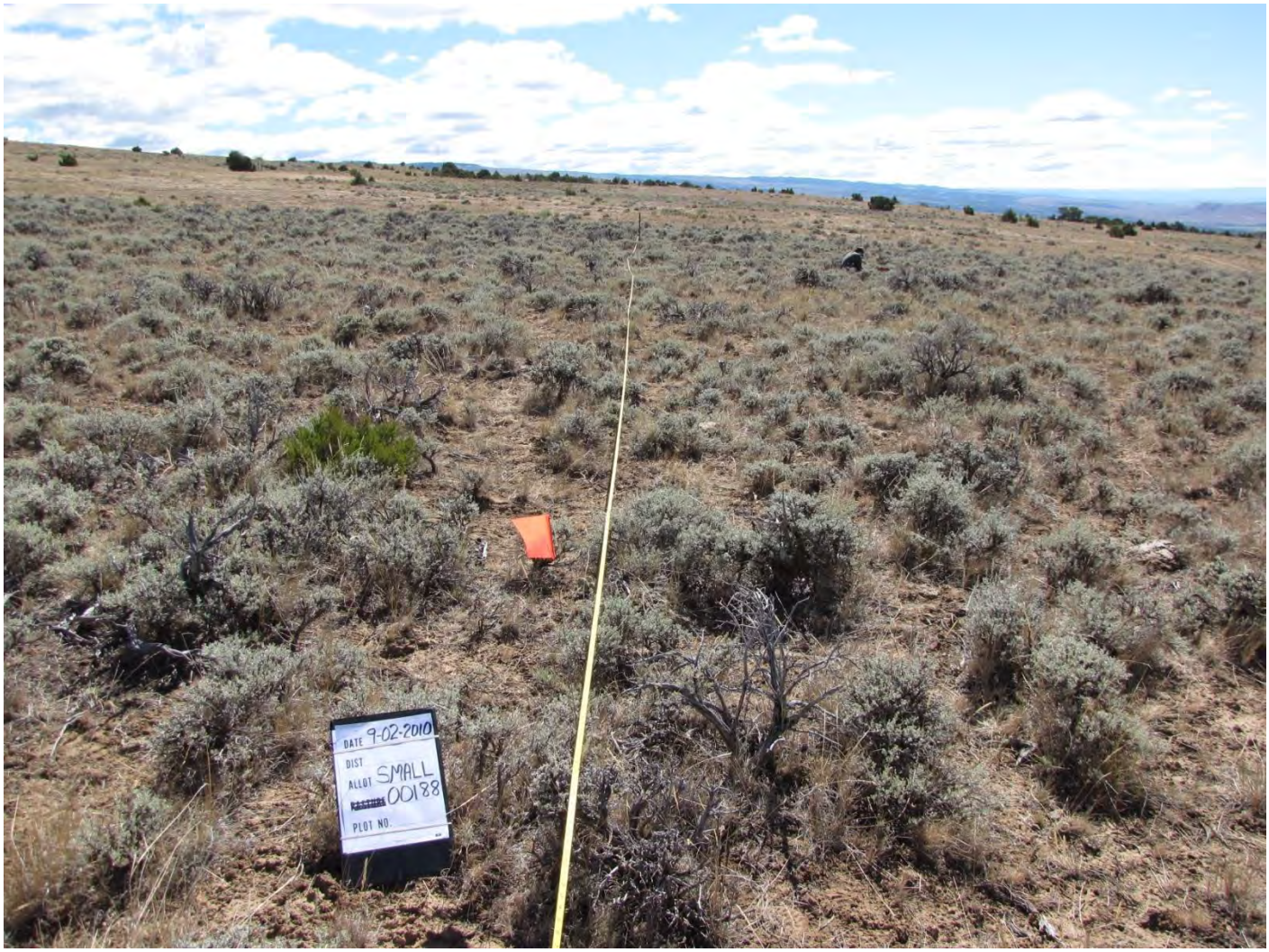
Map 3 Watershed Map



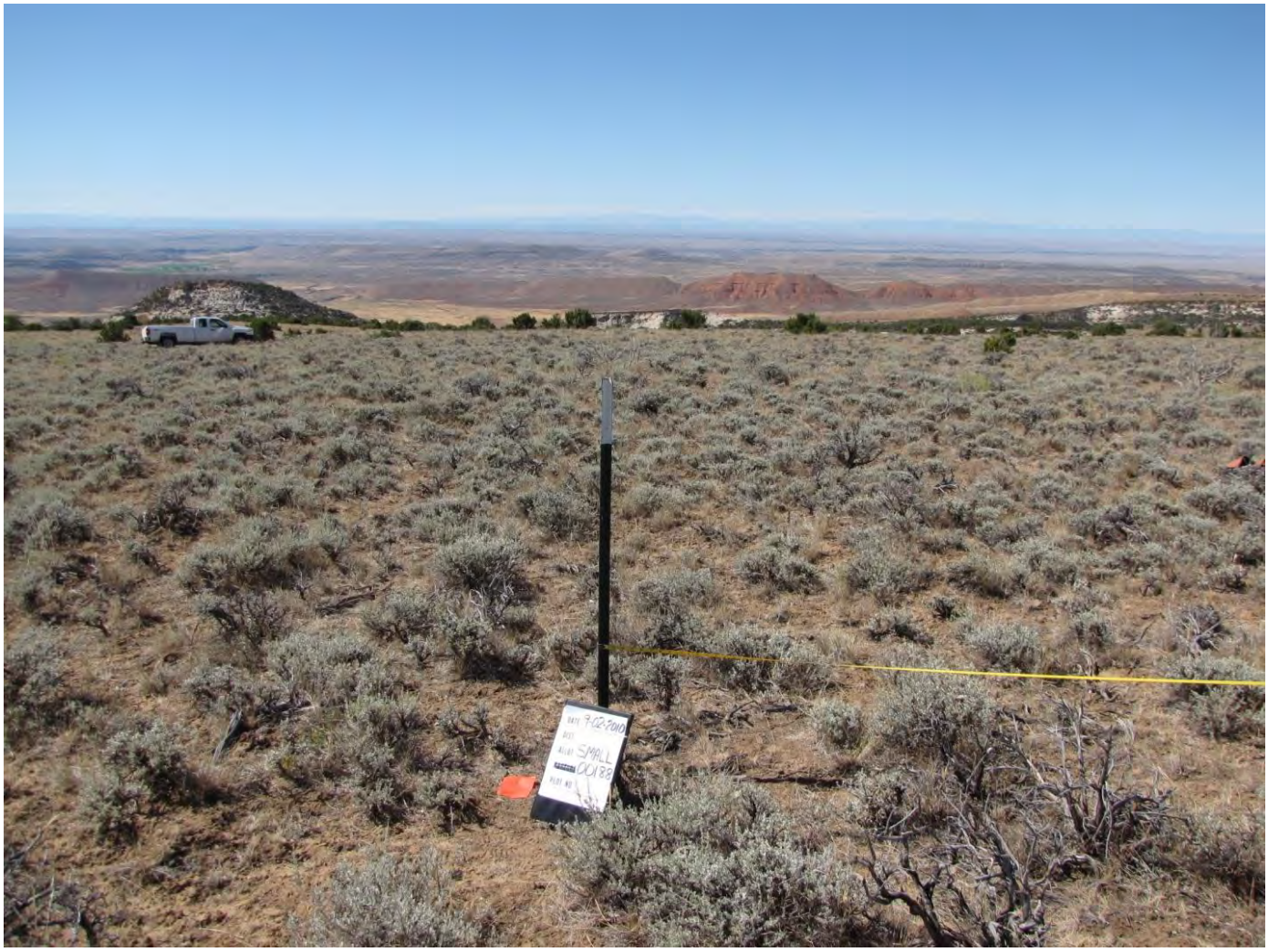
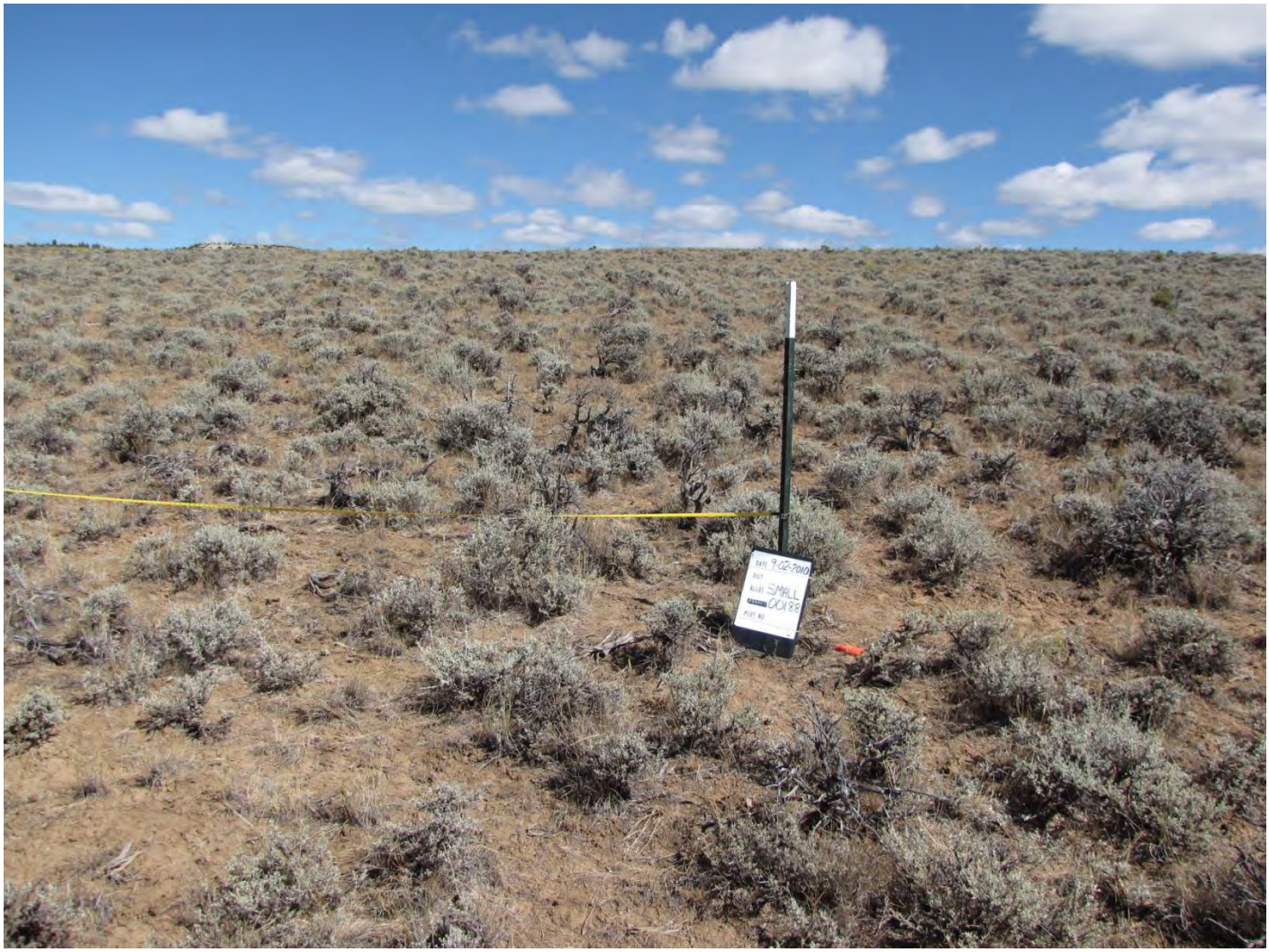
Transect Location, view to west:



Transect Location, view to east:



Transect Location, view to south:



Transect Location, view to north: