

Bureau of Land Management
WIND RIVER/BIGHORN BASIN DISTRICT
Worland Field Office

**Zimmerman Butte
Allotment
#00571**

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

October 2010



MISSION STATEMENT

The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

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1.0 INTRODUCTION

The Bureau of Land Management (BLM) grazing regulations at 43 Code of Federal Regulations (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 Zimmerman Butte Allotment. The results of this assessment are presented in this report. This assessment will serve to inform the public of 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 stage 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.

Standard #3: Upland vegetation on each ecological site consists of plant 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.

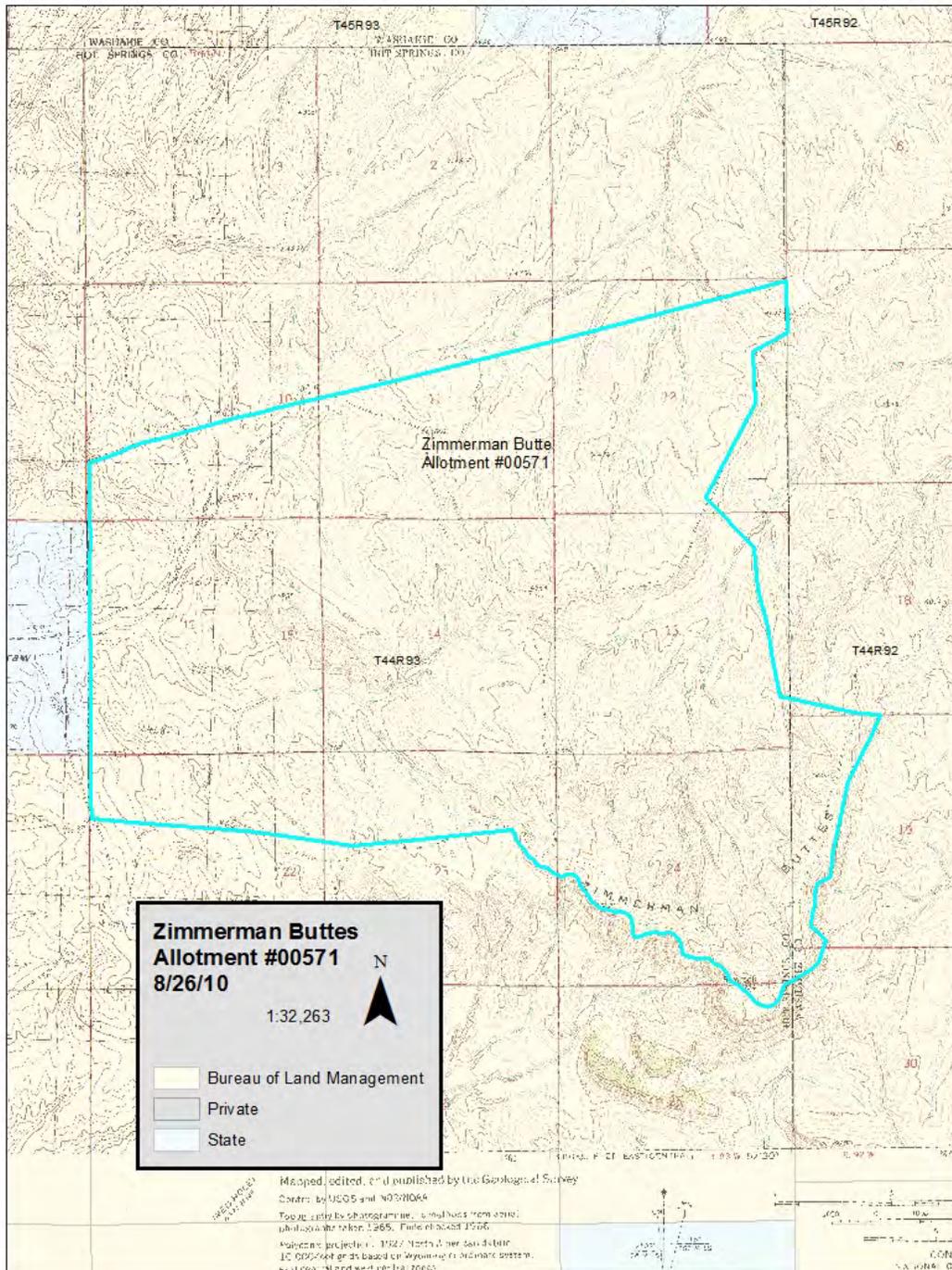
Standard #6: Air quality meets State standards

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

2.1 Location and Land Ownership

The Zimmerman Butte Allotment (**Map 1**) is located approximately 10 miles east of Lucerne, Wyoming. The average elevation is 4,700 feet above sea level. The allotment encompasses approximately 4,071 public land acres. There is public access throughout the allotment.

Map 1: Allotment



2.2 Hydrology

The allotment is located within three different United States Geological Service (USGS) Level #6 watersheds that are also identified by name and Hydrologic Units Code or (HUC) watersheds (**Map 2**). The allotment spans the watershed divide between the Bighorn River-Sand Draw that drains the western half of the allotment (3.22 square miles) and the Nowater Creek-Zimmerman Draw (3.16 square miles) watershed that drains the eastern half of the allotment (**Table 1**). There is also a very minor portion of the allotment (0.06 square miles) on the south slope of Zimmerman Butte located in the Lower Kirby Creek Watershed. The surface water flow regime consists of ephemeral drainages that drain mostly Cretaceous fine grained sandstone and shale deposits. All of the drainages in the allotment are considered to have an ephemeral flow regime using the definition provided by (Hedman, 1982) with surface flow in response to storm events and seasonal snow melt in the spring months for average of < 10 percent of the year.

Map 2: Watershed Map

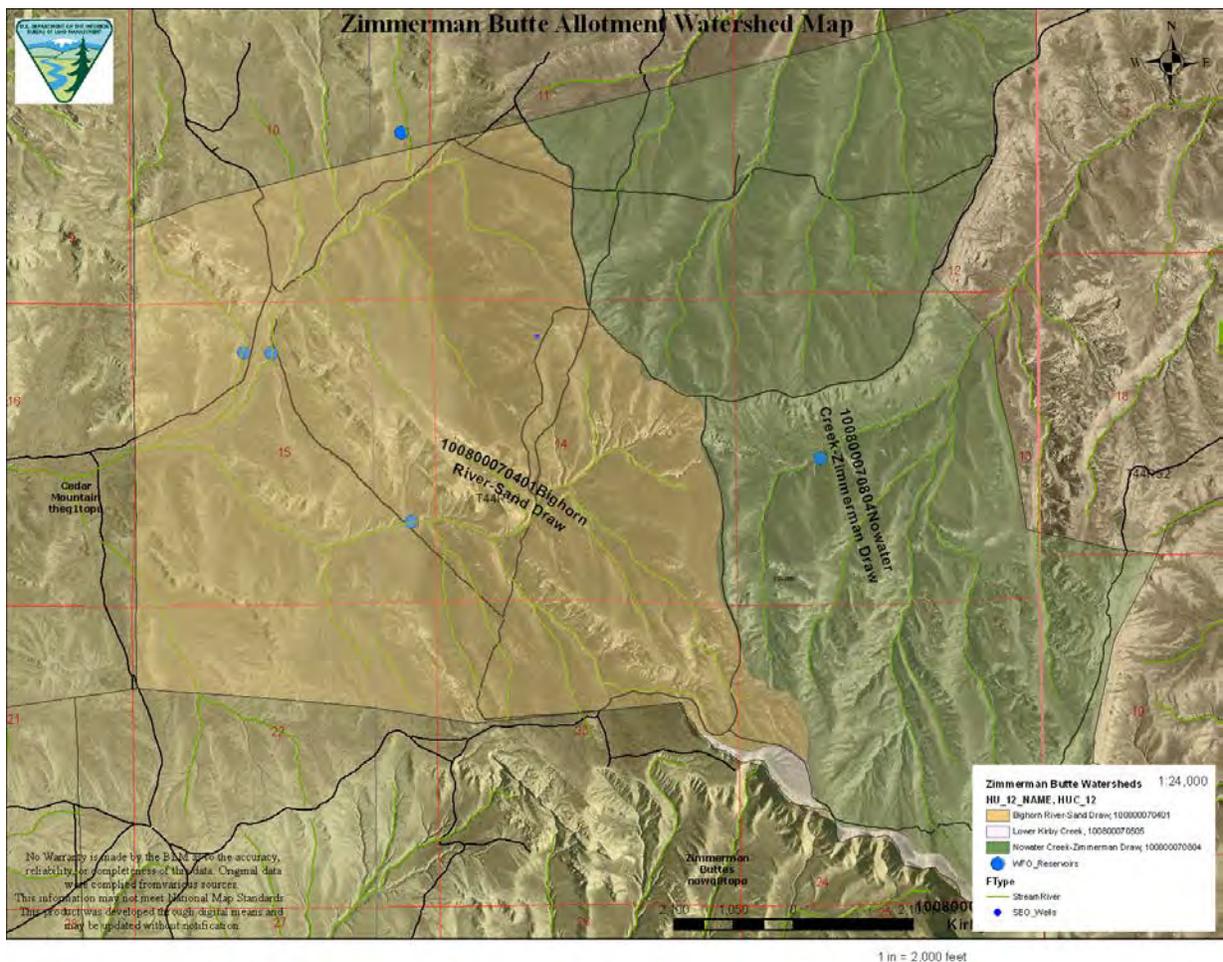


Table 1: Watershed Area

Watershed Name-Level #6 (HUC #)	Total (Mi ²)	(Mi ²)within allotment	(%) Mi ² of watershed in the allotment
Bighorn River- Sand Draw (100800070401)	49.9	3.22	6.5
Nowater Creek-Zimmerman Draw (100800070804)	77.3	3.16	4.1
Lower Kirby Creek (100800070505)	34.3	0.06	0.2

The drainages are similar to other lower elevation semi-arid watersheds in the Bighorn Basin with intermittent or ephemeral flow regimes and no perennial drainages in the allotment.

The current upland indicators suggest that the allotment is able to withstand storm events and other runoff producing events without excessive accelerated erosion occurring throughout the allotment.

Other potential impacts to hydrology in the allotment such as extensive road networks, recreational use, or oil and gas developments along with any other disturbances that cause changes in runoff conditions are not present in this allotment.

2.3 Climatic Features

Annual precipitation for the Zimmerman Butte area ranges from 10- 14 inches per year. The normal precipitation pattern shows the least amount of precipitation occurs 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 about 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
Mean 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.)

For detailed information visit the Natural Resources Conservation Service (NRCS) National Water and Climate Center at <http://www.wcc.nrcs.usda.gov/> website. Other climate station(s) representative of this precipitation zone include “Basin”, “Deaver”, “Lovell” and “Worland”, (Information taken from the United States Department of Agriculture (USDA) NRCS Technical Guide Section IIE Rev. 11/01/05).

2.4 Soils

The soils in the Zimmerman Butte Allotment reflect the desert environment in which they formed. They are highly variable, reflecting differences in parent material (sandstone, shale and/or mixed alluvium), position on the landscape, slope and aspect. Due to the strong influence of shale parent material, the soils throughout the allotment tend to be salt affected. Soil depth ranges from a few inches to over 60 inches. These soils typically have a light brown surface layer. Surface textures are loam, fine sandy loam, sandy loam, clay, and silty clay loam. The subsoil often reflects an increase in clay and saturated sodium, being expressed argillic, natric or natriargid horizons. Slopes range from 0 to 60 percent, but are generally less than 45 percent.

The allotment is situated in the transition zone between the 5 to 9 and 10 to 14 inch precipitation zones. NRCS spacial data places the allotment well within the dryer 5 to 9 inch precipitation zone while soil map units favor the 10 to 14 inch precipitation zone.

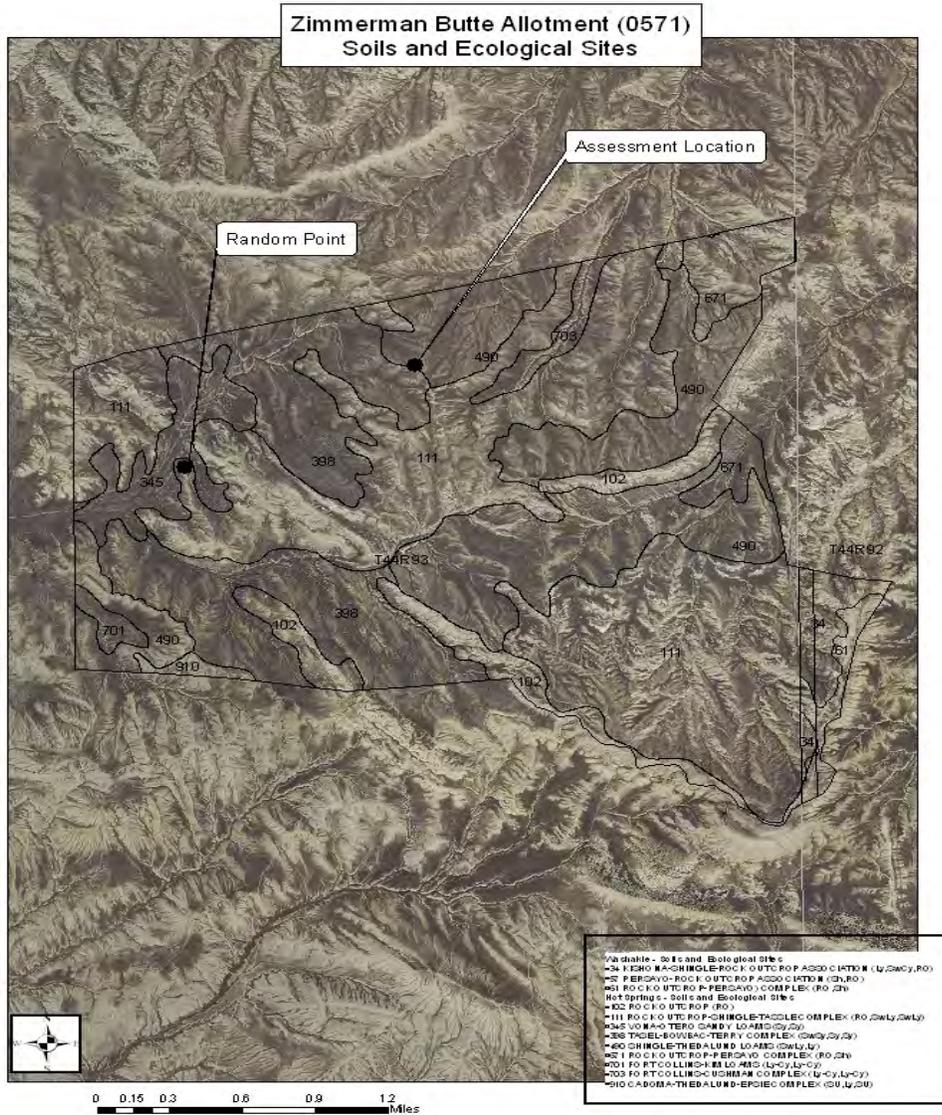
Based on the soil survey data for Hot Springs and Washakie Counties, the dominant ecological sites found in the in the allotment are listed below:

Loamy 10-14 inch precipitation zone	R032XY322WY
Shallow Loamy 10-14 inch precipitation zone	R032XY362WY
Saline Upland 10-14 inch precipitation zone	R032XY344WY
Saline Lowland 10-14 inch precipitation zone	R032XY338WY
Clayey 10-14 inch precipitation zone	R032XY304WY
Shale 5-9 inch precipitation zone	R032XY154WY

Two rangeland health assessments utilizing the methodology described in *Interpreting Indicators of Rangeland Health, Technical Reference 1734-6* were relied upon a in the analysis of the Zimmerman Butte Allotment. Assessment one was conducted in 2010 while assessment two was conducted in 2005, as a part of a broad watershed assessment effort. It is incorporated into this analysis.

Assessment one was located in Map Unit 490 Shingle-Thedalund Complex. The soil and ecological site at this location differ from the soils map. The soils are similar to the Otero soil series and the ecological site is a Sandy 10-14 inch precipitation zone. Assessment two is in Map Unit 111 Rock Outcrop-Shingle-Tassel Complex. The soils at this location were verified as representing the Tassel soil series supporting a Shallow Loamy 10-14 inch precipitation zone ecological site (**Map 3**).

Map 3: Soil and Ecological Sites



2.5 Upland Vegetation

The vegetation in the allotment consists of mid and short cool-season perennial upland grasses, big sagebrush, and a variety of forbs. More specifically, the native plant species identified during the 2010 assessment included Needle and thread (*Hesperostipa comata*), Bluebunch wheatgrass (*Pseudoroegneria spicata*), Thread leaf sedge (*Carex filifolia*), Sandberg bluegrass (*Poa secunda*), Wyoming big sagebrush (*Artemisia tridentata* spp. *Wyomingensis*), Rubber Rabbitbrush (*Ericameria nauseosa*), Broom snakeweed (*Gutierrezia sarothrae*), forb species including Scarlet globemallow (*Sphaeralcea coccinea*), Indian paintbrush (*Castilleja* spp.), Hood's phlox (*Phlox hoodii*), Missouri milkvetch (*Astragalus missouriensis*), Smooth woodyaster (*Xylorhiza glabruiscula*), and biological crusts.

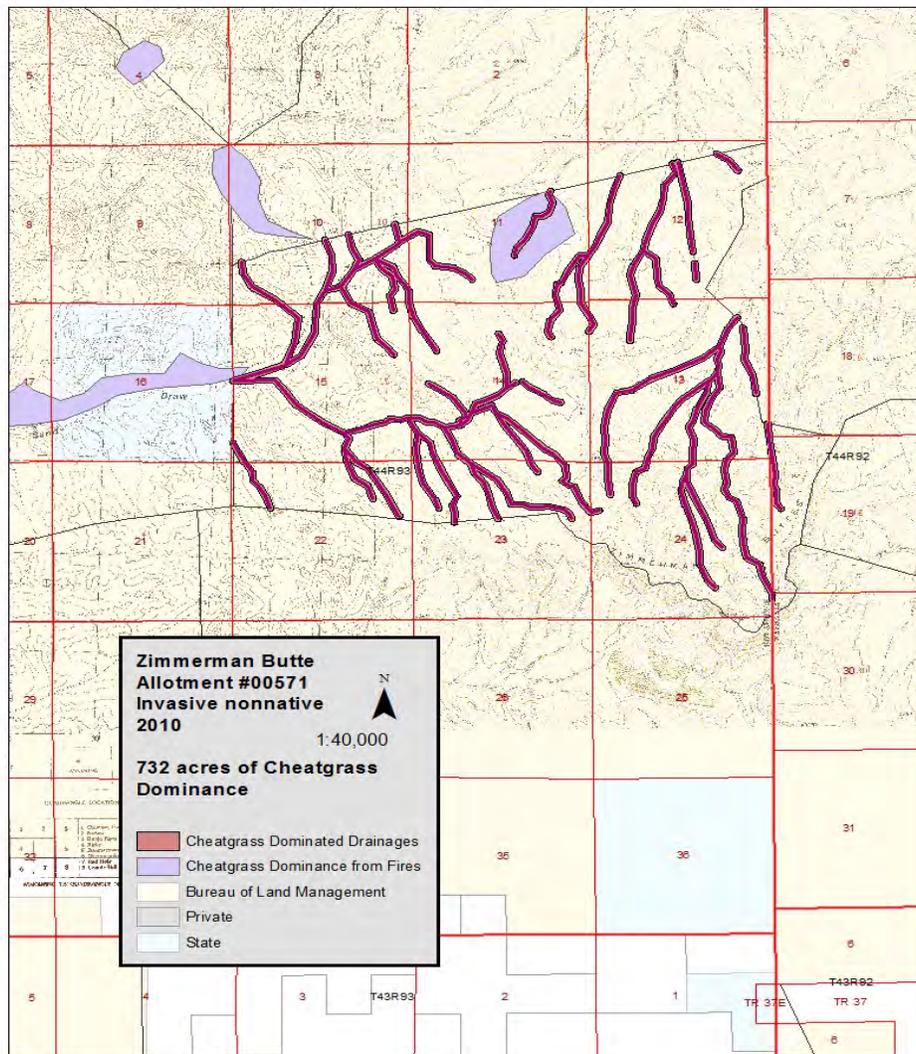
Native plants identified during the 2005 assessment included Bluebunch wheatgrass (*Pseudoroegneria spicata*), Indian ricegrass (*Achnatherum hymenoides*), Needleandthread grass (*Hesperostipa comata*),

Alkali sacaton (*Sporobolus airoides*), Sandberg bluegrass (*Poa secunda*), Blue grama (*Bouteloua gracilis*), Daisy (*Erigeron spp.*), Phlox (*Phlox spp.*), Plains pricklypear cactus (*Opuntia polyacantha*), Scarlet globemallow (*Sphaeralcea coccinea*), Vetch spp., Curlycup gumweed (*Grindelia squarrosa*), Big sagebrush (*Artemisia tridentata*), and Winterfat (*Eurotia lanata*). The dominant species on the site included Bluebunch wheatgrass and Big sagebrush.

This list is not all inclusive however the vegetation noted are those that are quite evident and readily available.

The plant community along many of the drainages as shown (**Map 4**) below, has shifted from a Perennial Grass/Big Sagebrush Plant Community to Big Sagebrush/Bare Ground Plant Community with cheatgrass invading the bare areas.

Map 4: Cheatgrass Dominance



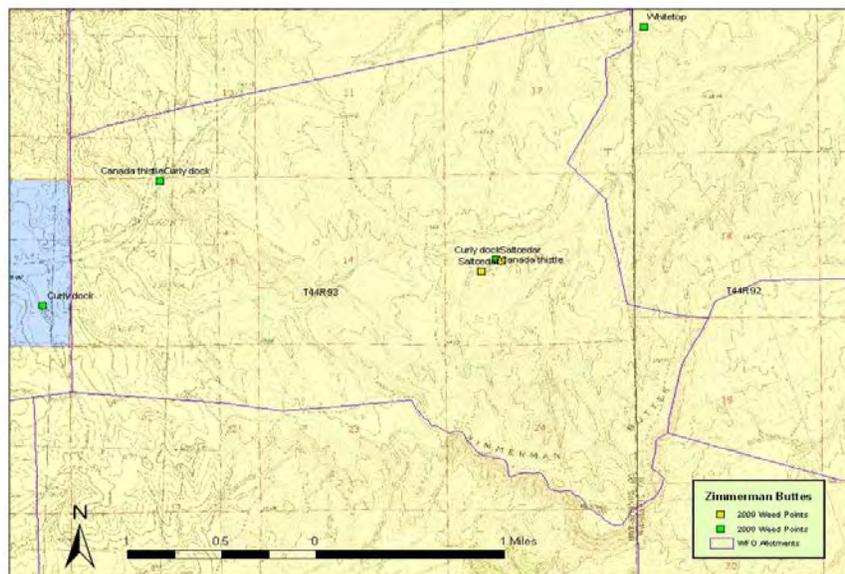
Example of the cheatgrass dominated drainages in the allotment



2.6 Invasive Species

As of the 2009 noxious weed inventory, saltcedar and Canada thistle were the only noxious weeds inventoried on the allotment, (**Map 5**). They occur primarily around reservoirs. Several other invasive weeds are present, including cheatgrass and curly dock. Whitetop occurs within a quarter mile, so continued monitoring and treatment will be necessary to keep weeds under control.

Map 5: Invasive Species



2.7 Livestock Grazing Use

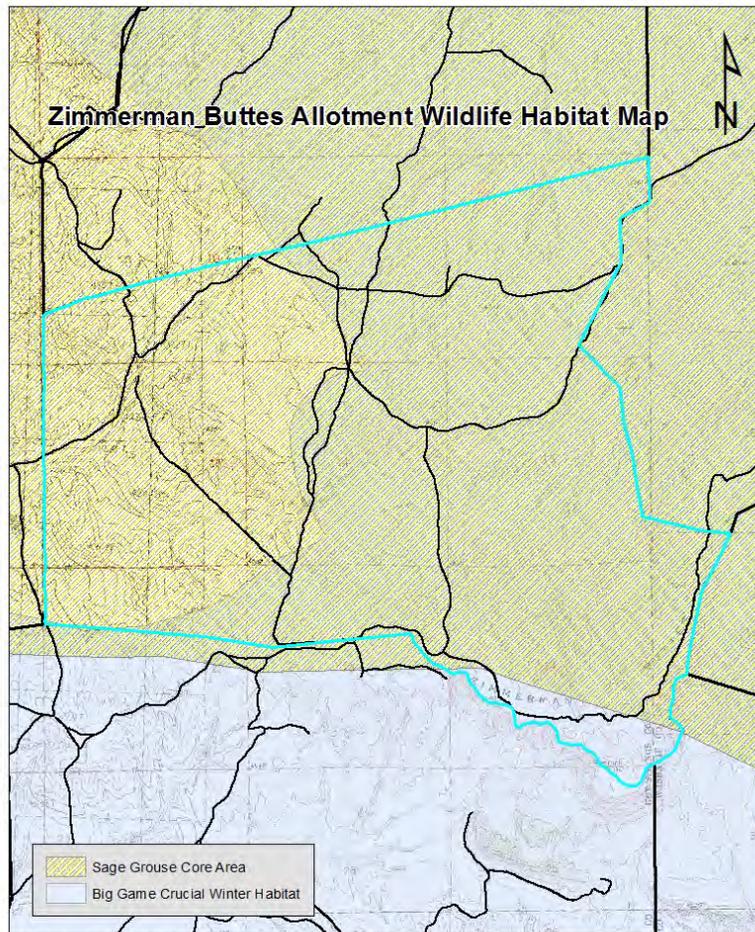
Livestock are authorized in the Zimmerman Butte Allotment as follows;

247 Cattle	10/01 to 12/01	100% Public Land	503 AUMs
Permitted Use (AUMs)			
503 Active	487 Suspended	990 Total	

2.8 Wildlife

Habitat on the Zimmerman Springs allotment is suitable for a wide range of big game, non-game, and sensitive wildlife species. The allotment is characterized by rolling drainages with small canyons and several smaller draws. Its vegetation is characterized by a mix of Wyoming Big sage brush and perennial grasses. Mule deer and antelope use the allotment throughout the year. From late fall through early spring the allotment provides important winter range for larger groups of wintering mule deer. The entire allotment is mapped as crucial winter range for mule deer. Qualitative survey data has shown that mule deer use the area in late fall during the rut. Antelope can also be observed throughout this allotment, particularly in the spring and summer. The allotment also provides habitat for a wide range of wildlife species such as small mammals and predators, numerous grassland passerines, game birds such as chukar and gray partridge, as well as numerous raptor species.

Map 6: Wildlife



2.9 Threatened or Endangered Species

No known threatened or endangered wildlife species have been observed or recorded utilizing habitat within the allotment

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

There are no known threatened or endangered or sensitive plant species known to occur in the Zimmerman Butte Allotment.

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

No known threatened or endangered wildlife species have been observed or recorded utilizing habitat within the allotment. Sage grouse, a BLM sensitive species is known to utilize habitat within the allotment, and nearly the entire allotment is within a sage grouse core breeding area. Historically, there were three active leks on the allotment, however no sage grouse have been recorded during breeding season in recent years, resulting in the leks being considered unoccupied. The proximity of the sage brush habitat on the allotment to active leks makes it likely that sage grouse utilize it for nesting and early brood-rearing activities.

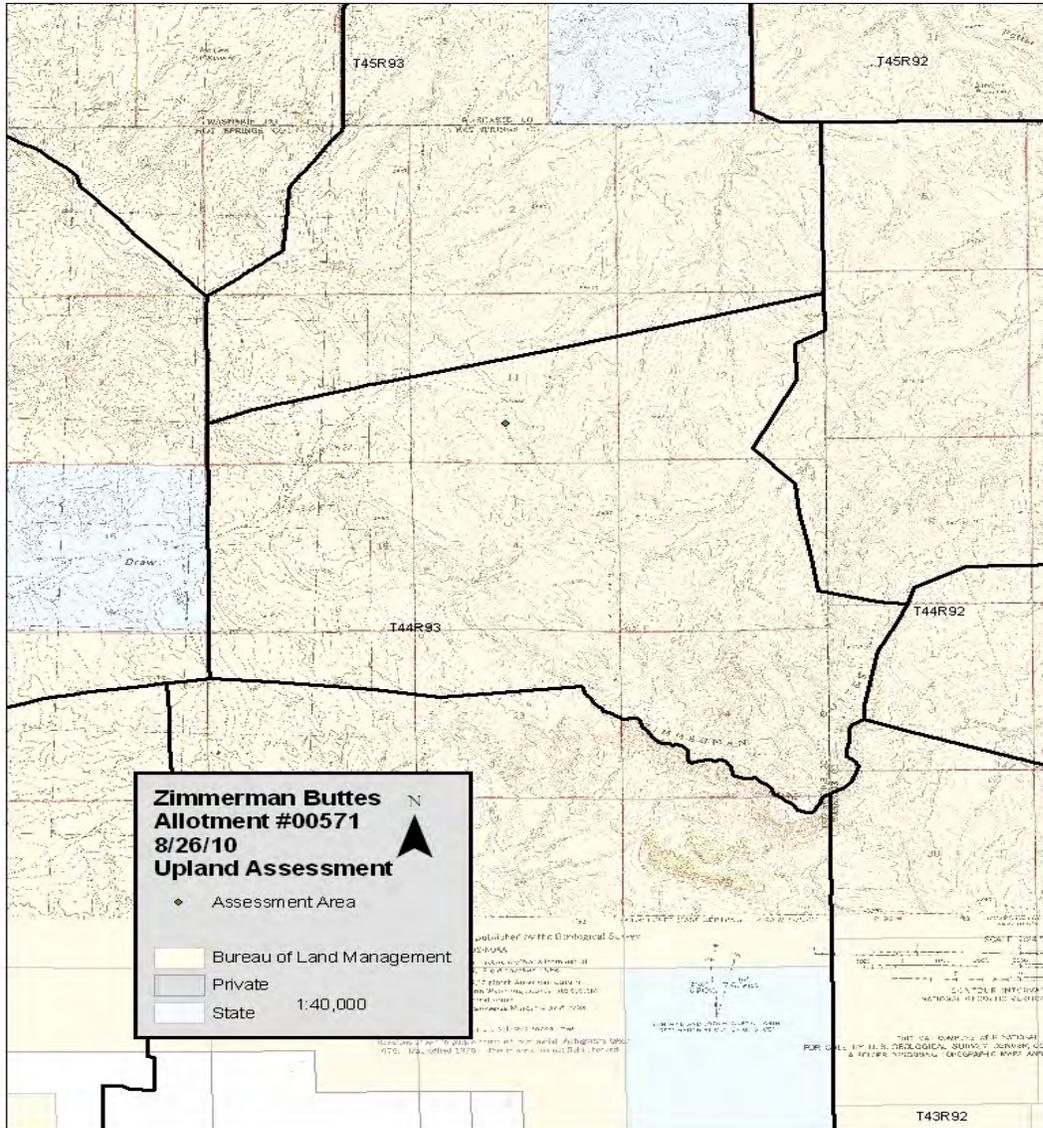
3.0 Summary of Monitoring Data

3.1 Rangeland Health Summary

An interdisciplinary team of BLM resource specialists evaluated the Zimmerman Butte Allotment using the “*Interpreting Indicators of Rangeland Health*”, Technical Reference 1734-6, Version 4. Monitoring of the allotment for the purpose of observing and recording the indicators of rangeland health occurred during the summer of 2010. An additional rangeland health determination was conducted in 2005 at a random point that was generated as a part of a broad watershed assessment effort.

The 2010 Assessment was located near an existing photo point established in 1990. It is also near three sage grouse leks.

Map 7: 2010 Assessment Location



Within the transect area the 17 indicators of rangeland health were observed and recorded. These indicators are broken into three categories - soil stability, hydrologic function and biotic integrity. The measurement of these indicators is based upon a departure from that which would be expected for the specific range site. The “measuring stick” to judge against is provided by the United States Department of Agriculture, Natural Resources Conservation Service in the form of an Ecological Site Description and Reference Sheet for each specific range site and precipitation zone. The indicators and the assessed departure are found in Table 2 below.

The 2010 assessment was located in a Sandy 10-14 inch precipitation zone ecological site. The attribute rating justification for soil and site stability, hydrologic function, and biotic integrity was determined to be slight to moderate.

Table 2: Assessment 1 - Soil /Hydrologic/Biotic Integrity Ratings

Indicator	Departure from Reference
1. Rills	None to Slight
2. Water Flow Patterns	Slight to Moderate
3. Pedestals and/or Terracettes	Slight to Moderate
4. Bare Ground - 29 percent	Slight to Moderate (10 – 30 percent expected)
5. Gullies	None to Slight
6. Wind-Scoured, Blowouts, and/or deposition areas	Moderate
7. Litter Movement	None to Slight
8. Soil Surface Resistance to Erosion - 4.6	Slight to Moderate (should be 2.7 or greater)
9. Soil Surface Resistance to Degradation	Slight to Moderate
10. Plant Community Composition and Distribution Relative to Infiltration	Slight to Moderate
11. Compaction Layer	None to Slight
12. Functional/Structural Groups	None to Slight
13. Plant Mortality/Decadence	None to Slight
14. Litter Amount – 26 percent	None to Slight (15-30 percent expected)
15. Annual Production	None to Slight
16. Invasive Plants	Slight to Moderate
17. Reproductive Capability of Perennial Plants	None to Slight

Attribute Rating Justification Summary
 Soil and Site Stability Rating – Slight to Moderate
 Hydrologic Function Rating – Slight to Moderate
 Biotic Integrity Rating – Slight to Moderate

Photos of Assessment 1 (2010)



Photo Point (1990)

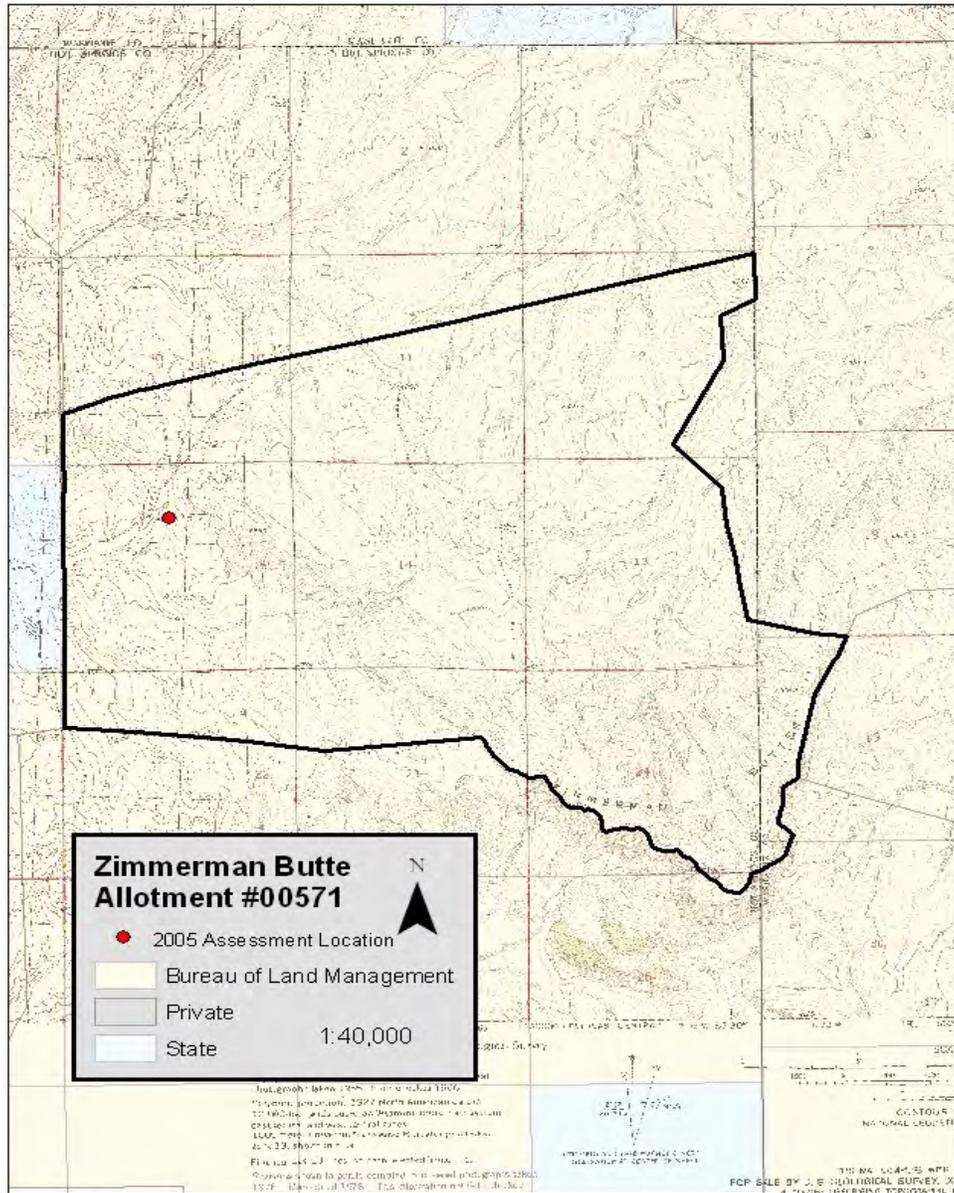


Photo Point (1993)



The 2005 rangeland health determination was conducted at a random point that was generated as a part of a broad watershed assessment effort.

Map 8: 2005 Assessment Location



The 2005 assessment was located in a Shallow Loamy 10-14 inch precipitation zone ecological site. The attribute rating justification for soil and site stability and hydrologic function was determined to be slight to moderate while the biotic integrity was rated as none to slight.

Table 3: Assessment 2 – Soil/Hydrologic/Biotic Integrity Ratings

Indicator	Departure from Reference
1. Rills	None to Slight
2. Water Flow Patterns	Slight to Moderate
3. Pedestals and/or Terracettes	Slight to Moderate
4. Bare Ground 49 percent	Slight to Moderate (15 to 45 percent expected)
5. Gullies	None to Slight
6. Wind-Scoured, Blowouts, and/or deposition areas	None to Slight
7. Litter Movement	Slight to Moderate
8. Soil Surface Resistance to Erosion	None to Slight
9. Soil Surface Resistance to Degradation	Slight to Moderate
10. Plant Community Composition and Distribution Relative to Infiltration	None to Slight
11. Compaction Layer	None to Slight
12. Functional/Structural Groups	None to Slight
13. Plant Mortality/Decadence	None to Slight
14. Litter Amount 14 percent	None to Slight (10 to 25 percent expected)
15. Annual Production	None to Slight
16. Invasive Plants	None to Slight
17. Reproductive Capability of Perennial Plants	None to Slight

Attribute Rating Justification Summary
 Soil and Site Stability Rating – Slight to Moderate
 Hydrologic Function Rating – Slight to Moderate
 Biotic Integrity Rating – None to Slight

Photos of Assessment 2 (2005)



3.2 Range Data

For management priorities, the allotment is classified in the “I2” (Improve) category.

Stocking Level

The 2010 assessment site is located at a Sandy 10 -14 inch precipitation ecological site. It has been determined to be Perennial Grass/Big Sagebrush Plant Community. The carrying capacity of this site is .30 (AUM/Acre) or 3.3 acres/AUM. The 2005 assessment site is located in a Shallow Loamy 10 – 14 inch precipitation ecological site. It has been determined to be a Perennial Grass/Mixed Shrub Plant Community. The carrying capacity of this site is .17 (AUM/Acre) or 5.9 acres/AUM. These rates are based on assuming continuous season long grazing. The Zimmerman Butte Allotment has 4071 public acres and 503 public AUMs. As a whole it is stocked below the suggested carrying capacity at approximately .12 (AUM/Acre) or 8 acres/AUM.

Actual Use

Authorized use has averaged 141 public AUMs over the past 21 years, (1990-2010). This equates to almost 29 acres/AUM.

Precipitation

The Kirby Creek Rain gauge (T.44N. R.94W. Section 36) near the allotment has a recorded 27 year average (1984-2010) of approximately 9 inches of precipitation.

Monitoring

Record of Use (1990-2010)

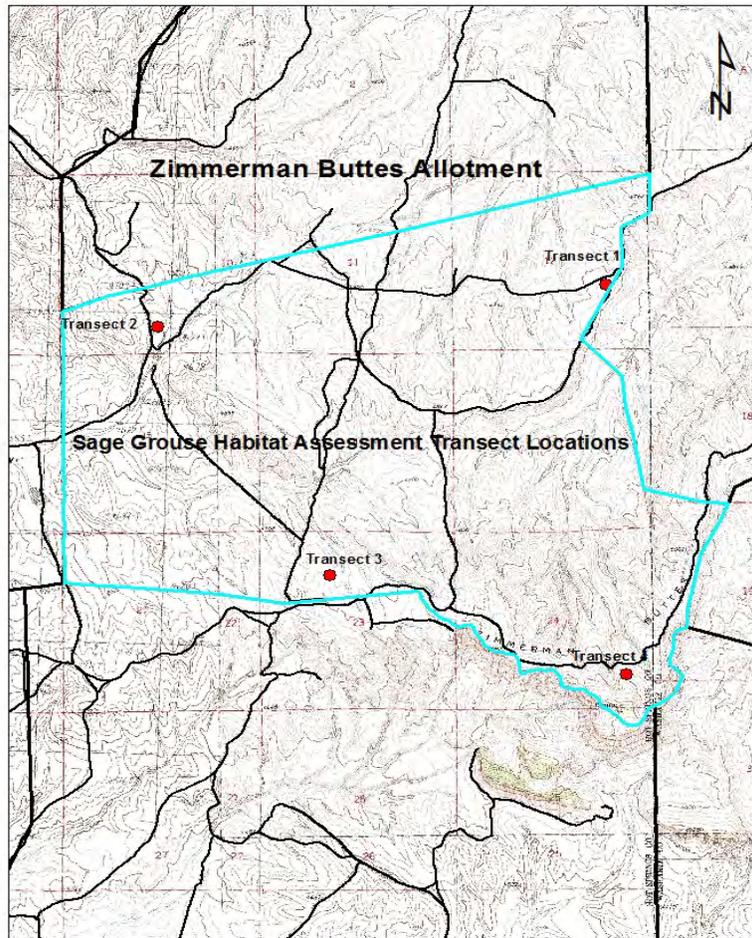
Year	Actual Use (AUMs)	Observed Utilization	Precipitation (inches)
1990	421		8.7
1991	421		10.45
1992	0		12.01
1993	403		10.91
1994	0		4.88
1995	501	Use varied throughout the allotment from 0- 40%	13.31
1996-2000	0		
2001	371		5.06
2002	390		6.57
2003-2007	0		
2008	72		11.12
2009	0		
2010	0		
21 years (1990-2010)	Average of 141 AUMs		

3.3 Wildlife Data

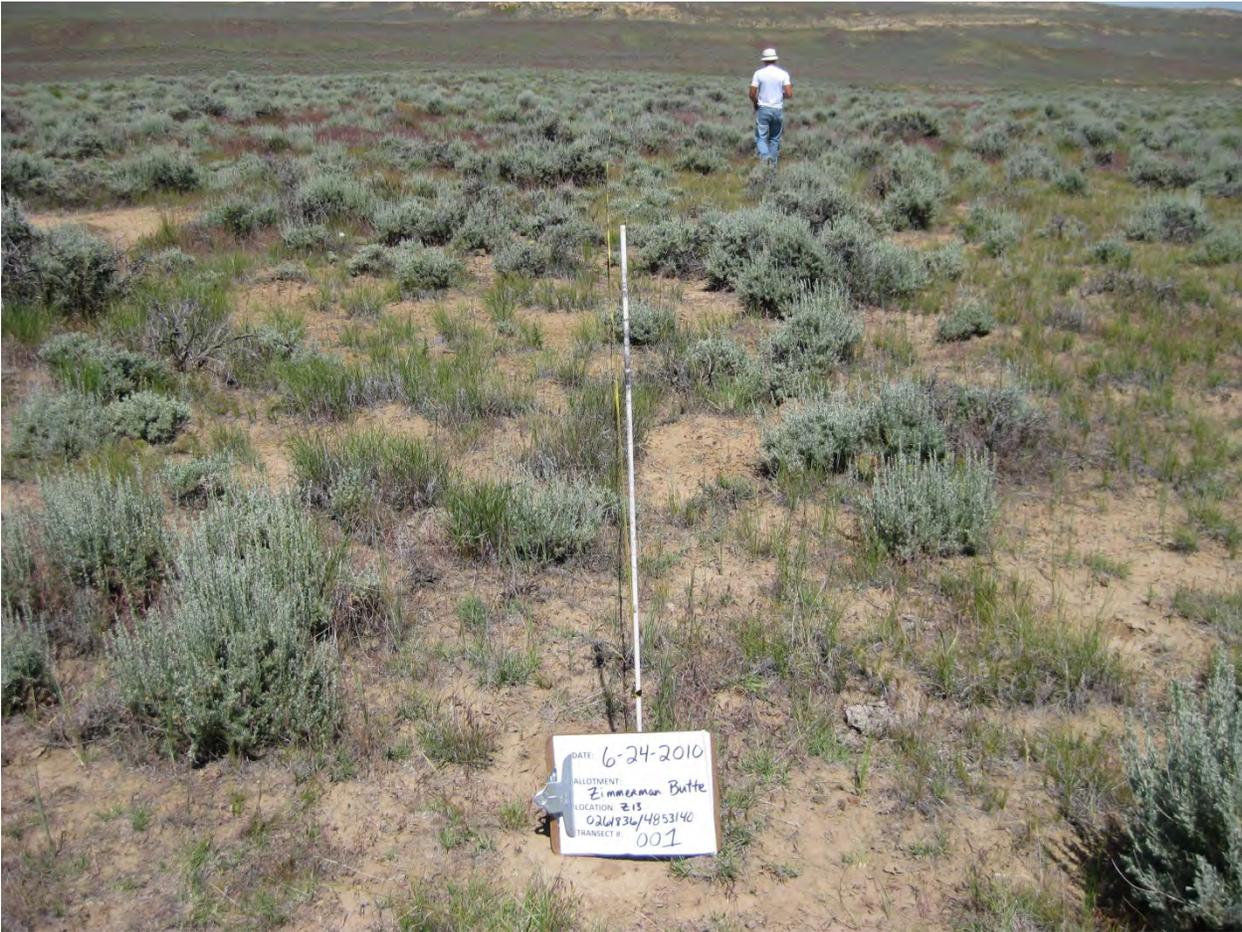
Sage Brush Canopy and Belt Transect Data

Transect #	% Live Sage Brush Canopy Cover	Sage Brush Height in Inches	% Mature Sage Brush
Transect 1	11	15	63
Transect 2	16	19	63
Transect 3	20	15	39
Transect 4	1	12	46
Average	12	15	53

Map 9: Sage Grouse Habitat Assessment Transect Locations



Sage Grouse Habitat Assessment Transect #1



Sage Grouse Habitat Assessment Transect #2



Sage Grouse Habitat Assessment Transect #3



Sage Grouse Habitat Assessment Transect #4



3.4 Water Quality

The Wyoming Department of Environmental Quality (DEQ) has not listed any of the drainages in the allotment as impaired on the *DEQ 2010 305b Water Quality Assessment Report*.

Grazing is considered a non-point source activity with potential impacts to water quality (Environmental Protection Agency (EPA), 1993 p.1). Many studies have documented the effects of grazing on riparian and upland vegetation along with 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, none of which are present in this allotment.

Other potential impacts to hydrology in the allotment such as extensive road networks, recreational use, or oil and gas developments along with any other disturbances that cause changes in runoff conditions are not present to any significant degree for this allotment.

3.5 Soil Site Stability and Upland Hydrology

Standard one for Healthy Rangelands was evaluated based on the attribute ratings for *Soil and Site Stability* and *Hydrologic Function* using rangeland health indicators 1 through 11 and 14. The rangeland health assessment conducted at Assessment site one was compared to the Reference Sheet for the Sandy 10-14 inch precipitation zone (R032XY350WY) ecological site dated 5/1/2008 to determine departures from normal.

The second assessment was conducted without the benefit of an NRCS reference sheet, as these were not available until 2008. For consistency, this assessment was compared against the Reference Sheet for the Shallow Loamy 10-14inch precipitation zone (R032XY362WY) dated 5/2/2008 to determine departure from normal.

Assessment One

Rills were not observed. Though not common, water flow patterns are present; they were six to eight feet long and disconnected, and terminate on terracettes. Pedestals beneath shrubs were three to five inches tall, while the pedestals beneath the upland sedge, that characterizes the area, are only one inch tall.

Windblown sands were certainly a contributing factor in the formation of the pedestals. Terracettes were also present; generally they are three to five inches tall. Where terracettes occurred in association with wind-scour areas, they were more pronounced, approaching six to eight inches in height. Slopes of six to eight percent were a contributing factor to the formation of terracettes. Transect data determined bare ground to be 29 percent. This is the upper end of that described in the site guide, where bare ground ranges from 10 to 30 percent. Litter cover expressed as ‘total canopy’ was determined to be 26 percent; the reference sheet describes ‘total canopy litter’ as ranging from 15 to 30 percent. No gullies were observed.

Wind-scour areas were present but not extensive. They extended four to five feet across with six to eight inch terracettes having developed on the uphill side of many of these areas. Litter movement was only observed within water flow patterns. The soil stability index (SSI), an indicator of soil surface resistance to erosion was 4.6; the reference sheet places the average SSI at 2.7 or greater. Based on the transect data, biological soil crusts accounted for four percent of the total cover, thus adding an additional protection to the soil surface. The fibrous root mass of the sedge plant community is further protecting the soil surface. In contrast to the wind-scour areas, the A horizon was observed to be four inches thick. This in itself would indicate minimal historic soil loss. Due to the sedge component, the plant community composition should allow for maximum infiltration and minimal runoff. No soil compaction was observed.

Based on the observations discussed above the attribute rating for *Soil and Site Stability* and *Hydrologic Function* were rated as “slight to moderate”.

Assessment Two

Rills were not observed. Water flow patterns were present only on slopes greater than 15 percent. Pedestals and terracettes ranging from three to six inches tall have formed on the steeper slopes. Transect data determined bare ground to be 49 percent. This is slightly greater than that expected which ranges from 15 to 45 percent. Litter cover expressed as ‘total canopy’ was determined to be 14 percent. The reference sheet describes ‘total canopy litter’ as ranging from 10 to 25 percent. No gullies were observed and no wind-scour areas were observed. There was some indication of litter movement on steeper slopes. The soil stability index (SSI), was not determined, instead soil stability was estimated by observing soil peds in a soil pH dish; the soil was determined to be resistant to erosion. The soil surface appeared intact with no evidence of historic soil loss. Based on the transect data, biological soil crusts account for one percent of the total cover, thus adding some further protection to the soil surface. The plant community

composition is capable of minimizing runoff and maximizing infiltration. No soil compaction was observed.

Based on the observations discussed above the attribute rating for *Soil and Site Stability* and *Hydrologic Function* were rated as “slight to moderate”.

3.6 Upland Vegetation Biotic Integrity

The vegetative community, ground cover, and soil surface attributes for the assessment sites were noted, measured and compared to the Ecological Site Description (ESD) produced by the NRCS. This was to determine a rating to apply to the Biotic Integrity portion of the assessment through the use of the 17 indicators of rangeland health (Indicators 8, 9, and 11 through 17). This rating is dependent upon the assessment of the indicators and can vary from a “none to slight” to “extreme to total” deviation from the applicable ESD and corresponding reference sheet. The rating for the first assessment was “Slight to Moderate”, while Assessment Two was rated as “None to Slight.”

Assessment One

The rangeland health assessment conducted at Assessment One was compared to the Reference Sheet for the Sandy 10-14 inch precipitation zone (R032XY350WY) ecological site dated 5/1/2008 to determine departures from normal. According to the reference sheet, the **Historic Climax Plant Community (HCPC)** for this site is a Needleandthread/Indian Ricegrass Plant Community. Potential vegetation is about 75 percent grasses or grass-like plants, 15 percent forbs, and 10 percent woody plants. Moderate continuous season-long grazing or extended droughts will convert the plant community from HCPC to the **Perennial Grass/Big Sagebrush Plant Community**. This plant community is still dominated by cool-season grasses, while short warm-season grasses and miscellaneous forbs account for the balance of the understory. Shrubs would be a conspicuous part of the site. Soils are mostly stable and the surface shows minimum soil loss. The water shed is functioning and the biotic community is intact. Prescribed grazing or possible long-term prescribed grazing will convert this plant community to the HCPC. Frequent and severe grazing plus no fire, will convert the Perennial Grass/Big Sagebrush Plant Community to the **Big Sagebrush/Bare Ground Plant Community**. Frequent and severe grazing (yearlong grazing) plus wildfire or brush management will convert this plant community to a **Threadleaf Sedge Sod Plant Community**.

States beyond the Perennial Grass/Big Sagebrush Plant Community are likely to have a biotic, soil, and hydrologic function that is at risk or not functioning. Herbaceous production will decline, the undesirable species increase as the desirable species decrease, and the ability to move towards HCPC becomes greatly diminished without mechanical treatments, reseeding efforts, soil remediation efforts, and intense grazing management.

Data

The data collected for assessment site one indicates that this site represents the Perennial Grass/Big Sagebrush Plant Community in the current State and Transition Models from the NRCS Ecological Site Descriptions. Cool season bunchgrasses dominate and closely match the species expected for the site. The herbaceous component is mostly intact and the plant vigor and replacement capabilities are sufficient. The vegetation on this site is dominated by mid-cool-season perennial grasses including Needle and thread and Bluebunch wheatgrass. Of the vegetative hits encountered in the cover transect; grasses/grass like plants accounted for approximately 34 percent, forbs 12 percent and woody species 29 percent. Lichens and biological soil crusts accounted for 25 percent. Cheatgrass was present primarily in disturbed areas such as the drainages. Plant mortality/decadence was none to slight. Litter was 26 percent with 15 to 30 percent expected. Bare ground was 29 percent with 10 to 30 percent expected. The assessment site did not achieve the status of a Historic Climax Plant Community due to the presence of the amount of Threadleaf sedge and the absence of Indian ricegrass. In addition, the cover transect

picked up Broom Snakeweed which could indicate a past downward trend in rangeland health. It is likely that many years of non-growing season use and nonuse has reversed this trend.

Assessment Two

The second assessment was conducted without the benefit of an NRCS reference sheet, as these were not available until 2008. For consistency, this assessment was compared against the Reference Sheet for the Shallow Loamy 10-14inch precipitation zone (R032XY362WY) dated 5/2/2008 to determine departure from normal.

The **Historic Climax Plant Community (HCPC)** for this site is a Bluebunch wheatgrass/Needleandthread Plant Community. Potential vegetation is about 75 percent grasses or grass-like plants, 10 percent forbs, and 15 percent woody plants. Moderate, continuous season- long grazing or extended droughts will convert the plant community from HCPC to the **Perennial Grass/Mixed Shrub Plant Community**. This plant community is still dominated by cool-season grasses, while short warm-season grasses and miscellaneous forbs account for the balance of the understory. A variety of shrubs would be a conspicuous part of the site. Soils are mostly stable and the surface shows minimum soil loss. The water shed is functioning and the biotic community is intact. Prescribed grazing or possible long-term prescribed grazing will convert this plant community to the HCPC. Frequent and severe grazing plus no fire on less saline soils will convert the Perennial Grass/Mixed Shrub Plant community to the **Mixed Shrub/Bare Ground Plant Community**. Frequent and severe grazing (yearlong grazing) plus wildfire or brush control will convert the plant community to the **Blue Grama Sod Plant Community**. Frequent and severe grazing on more saline soils will convert the plant community to the **Salt Tolerant Shrub/Bare Ground Plant Community**.

States beyond the Perennial Grass/Mixed Shrub Plant Community are likely to have a biotic, soil, and hydrologic function that is at risk or not functioning. Herbaceous production will decline, the undesirable species increase as the desirable species decrease, and the ability to move towards HCPC becomes greatly diminished without mechanical treatments, reseeding efforts, soil remediation efforts, and intense grazing management.

Data

Data collected at Assessment Two currently represents the Perennial Grass/Mixed Shrub Plant Community state in the current State and Transition Models from the NRCS Ecological Site Descriptions (11/1/05). The plant community is still dominated by cool-season grasses such as Bluebunch wheatgrass. Cool season bunchgrasses dominate and closely match the species expected for the site. Of the vegetative hits encountered in the cover transect; grasses/grass-like plants accounted for approximately 64 percent, forbs 7 percent and woody species 22 percent. Lichens and biological soil crusts accounted for 7 percent. There was very little cheatgrass observed at the assessment site and surrounding area. Plant mortality/decadence was none to slight. Litter was 14 percent with 10 to 25 percent expected. Bareground was 49 percent with 15 to 45 percent expected. This site did not achieve the status of Historic Climax Plant Community due to the presence of too much Wyoming big sagebrush (>15%).

Drainages

Many of the drainages in the allotment are a Loamy 10-14 inch precipitation zone ecological site with clayey influences. These sites do not fit neatly into the State and Transition Models for either a Loamy or Clayey site. The vegetation found in these areas tends to be a mix of cheatgrass and rhizomatous wheatgrasses along with Sandberg bluegrass, bluegrama, cactus, and annuals. Salt tolerant plant species such as the saltbushes may also be present. They may or may not have the presence of Wyoming big sagebrush. The soils are mostly stable and recent soil loss is minimal. This plant community is resistant to change.

4.0 Conclusions

This section draws conclusions and makes determinations regarding:

Progress towards or attainment of the standards for rangeland health, and

Whether livestock management is in conformance with the guidelines, and

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:

Erosion indicators (water flow patterns, pedestals, terracettes,) were present at both the assessment sites and on the steeper slopes (>15%) at the site evaluated in 2005. At assessment site one, slopes of 8 to 10 percent are contributing to formation of the erosion features, while erosion indicators at assessment site two were restricted to slopes greater than 15 percent. Windblown sands from the sandy surface textures and the wind-scour areas could be causative to the formation of pedestals at assessment site one. At both sites the soil surface is stable and does not readily slake or disperse in water. At assessment site one the soil surface is further protected by the thick root mat associated with the sedge plant community, and biological soil crusts add further to the protection to the soil surface. This being said, the wind-scour areas at assessment site one is totally unexpected on this site and cannot be explained. Throughout the allotment the vegetative and litter cover are adequate to protect the soil from rain drop impact and the erosive forces of overland flow. Where present, gullies are stable and healing; no nick points or head-cuts were observed. Shallow soil pits did not reveal historic soil loss or evidence of soil compaction.

Possible explanations for wind-scour areas include the west exposure on which assessment site one is located, making disturbed areas susceptible to westerly winds. The bare areas could possibly be the result of the drought that lasted from 2000 until 2006 with the prevailing westerly winds slowing recovery. The sedge plant community would have been particularly susceptible to damage during the drought years.

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 are no known or inventoried riparian segments located in the allotment. There are no perennial sources of water from seeps or springs present in the allotment. There is no evidence of any historic riparian areas or other floodplains in the allotment therefore this standard is not applicable.

4.3 Standard 3

*Upland vegetation on ecological site consists of plant communities appropriate to the site which are resilient, diverse, and able to recover from natural and human disturbance. **MET/NOT MET***

Rationale:

The majority of the acres in the Zimmerman Butte Allotment meet the standard. The assessment sites are represented by a Sandy and a Shallow Loamy 10 – 14 inch precipitation zone ecological site. These sites represent the Perennial Grass/Big Sagebrush and the Perennial Grass/Mixed Sagebrush ecological sites in the State and Transition Models from the NRCS Ecological Site Descriptions.

Neither assessment sites have crossed a threshold to a state where treatments are required to improve the plant community toward a preferred state. These sites are in a dynamic equilibrium with the Historic Climax Plant Community. This means that at this time these sites have appropriate pathways available to them to respond to proper grazing strategies, favorable environmental conditions, and environmental events such as wildfires. The actual grazing use – not the permitted - has been such that the sites and current states have remained in that dynamic equilibrium with the Historic Climax Plant Community. This situation lends further credence to the current plant communities being “resilient, diverse, and able to recover from natural and human disturbance.”

The plant community along many of the drainages has shifted from a Perennial Grass/Big Sagebrush plant community to a Big Sagebrush/Bare Ground plant community with cheatgrass invading the bare areas. This plant community is resistant to change. Removal of grazing does not seem to affect the composition or structure of the plant community. These sites due to the large presence of cheatgrass have crossed a threshold to a state where treatments would be required to improve the plant community toward a preferred state.

An estimated acreage of these sites is 732 acres or 18 percent of the acres in the allotment that do not meet the standard as a result of cheatgrass encroachment and not current grazing.

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:

Four separate habitat assessment transects were conducted during the growing season of 2010 to determine and record the canopy cover, brush height, and vegetation components of the wildlife habitat on the allotment. Sage brush canopy cover was determined to range from 1 to 20 percent over the entire allotment, and sage brush height averaged approximately 15 inches. Belt transect surveys determined the mature sage brush component to average approximately 53 per cent over the allotment, indicating vigorous sage brush growth appropriate for this habitat and precipitation zone.

Additional plant species recorded were Japanese brome, Bottlebrush squirreltail, sego lily, Indian paintbrush, Prickly pear cactus, Sandberg bluegrass, Blue bunch wheatgrass six weeks fescue, toad flax, lichen, larkspur, mad wort, Indian ricegrass, salsify, mustard spp., Scarlet globe mallow, and erigeron spp.

Wildlife species observed during monitoring and transects was mule deer, antelope, coyote, sage grouse, numerous grassland passerines, golden eagle, and cottontail rabbit.

The condition of the habitat evaluated on this allotment and the variety of species recorded utilizing it indicate that it is providing wildlife forage and cover needs, and that it is capable of sustaining viable populations and a diversity of native plant and animal species appropriate to this habitat.

4.5 Standard 5

Water quality meets State standards. UNKNOWN

Rationale:

The Wyoming Department of Environmental Quality (WYDEQ) has not listed any of the drainages as impaired on the *DEQ 2010 305b Water Quality Assessment Report* [Integrated State Water Quality](#)

[Assessment Report](#). The drainages in the allotment are not rated by the WYDEQ for any specific use classification, due to the small size and limited extent and are therefore unknown.

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 that this standard is or is not being met. An air quality monitoring station was recently established in the Bighorn Basin, but no 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.

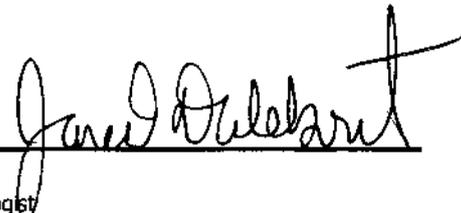
5.0 RESOURCE SPECIALIST SIGNATURES

X 
Rangeland Management Specialist

X 
Supervisory Rangeland Management Specialist

X 
Wildlife Biologist

X 
Natural Resource Specialist, Weed Coordinator

X 
Hydrologist

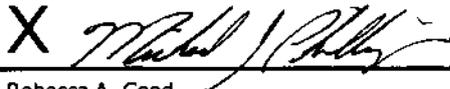
X 
Assistant Field Manager - Resources

X 
Natural Resource Specialist, Soils

X _____
Other _____

6.0 DETERMINATION

Based on information provided in this assessment, I have determined that standards, 1 and 4 are being met and standard 2 is not applicable. I have determined that approximately 3339 acres (82%) are meeting standard 3 and 782 acres (18%) are not meeting standard 3. The determination of standards 5 and 6 are unknown.



for Rebecca A. Good
Field Manager, Worland Field Office

5/24/2013
Date

7.0 FACTORS RELATED TO NONCONFORMANCE WITH STANDARDS:

Many of the drainages in the allotment are a Loamy 10-14 inch precipitation zone ecological site with clayey influences. The vegetation found in these areas tends to be a mix of cheatgrass and rhizomatous wheatgrasses along with Sandberg bluegrass, bluegrama, cactus, and annuals. Salt tolerant plant species such as the saltbushes may also be present. They may or may not have the presence of Wyoming big sagebrush. The soils are mostly stable and recent soil loss is minimal. This plant community is mostly resistant to change. Removal of grazing does not seem to affect the composition or structure of the plant community. These sites due to the large presence of cheatgrass have crossed a threshold to a state where treatments such as prescribed grazing, brush management, and seeding would be required to improve the plant community toward a preferred state.

The reason for the nonconformance is likely due to historic season long or over grazing of the public lands by livestock. Currently the allotment is scheduled to receive critical growing season use 1 in 3 years however; the allotment has only received spring use once in 21 years and with limited fall use. Current grazing management is designed to maximize the native cool season plant growth thereby providing the opportunity to improve or maintain rangeland health thus limiting the opportunity for cheatgrass to increase.

8.0 SELECTED GUIDELINES TO IMPLEMENT CHANGE IN GRAZING MANAGEMENT:

None

9.0 REFERENCES

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.

EPA 1993. Monitoring Protocols to Evaluate Water Quality Effects of Grazing Management on Western Rangeland Streams. EPA 910/R-93-017.p.1

DEQ, 2010. Wyoming's 2010 305(b) Integrated State Water Quality Assessment Report .p 28. Found at the following website. <http://deq.state.wy.us/wqd/watershed/Downloads/305b/2010/WY2010IR.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.

United States Department of Agriculture (USDA) NRCS Technical Guide Section IIE Rev. 11/01/05).

"Interpreting Indicators of Rangeland Health", Technical Reference 1734-6, Version 4.

USDA, 2009, Grazing Influence, Management and Objective Development in Wyoming's Greater Sage Grouse Habitat