Bureau of Land Management

WIND RIVER/BIGHORN BASIN DISTRICT
Worland Field Office

Buffalo Creek Allotment
#00120

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

FY2014/15

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 Buffalo Creek Allotment No. 00120. 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 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 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.

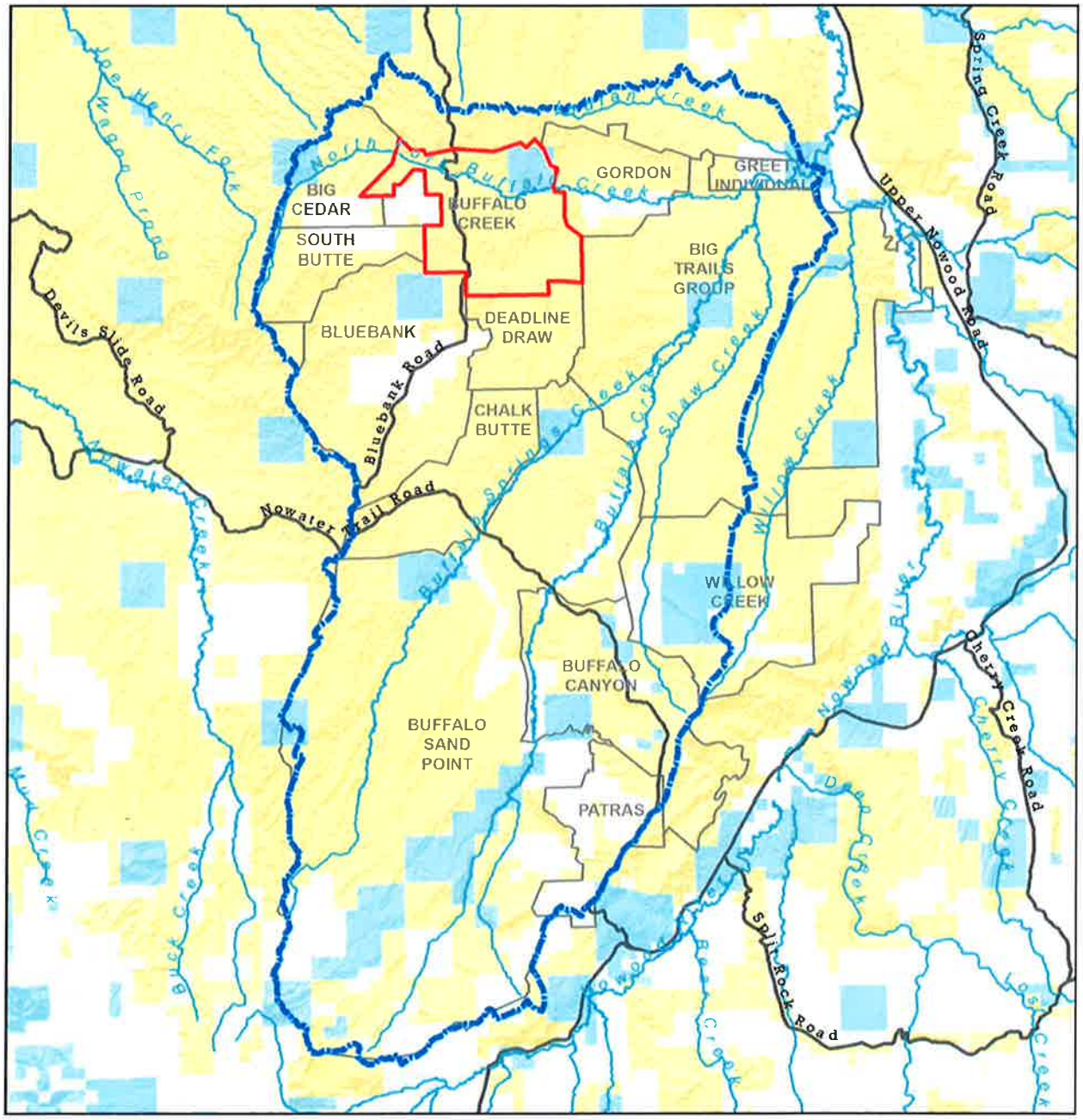
Standard #5: Water quality meets State standards

Standard #6: Air quality meets State standards

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

2.1 Location and Land Ownership

The Buffalo Creek Allotment is located approximately 20 miles south of Ten Sleep, WY. The allotment acreage determined through both GIS and ground truth, encompasses approximately 5,311 acres of public land, and 591 acres State lands. For management priorities, the allotment consist of 100% public AUMs and is classified in the "I" (Improve) category.



2.2 Climate/Air Quality

The allotment is within a transitional precipitation zone of 5-9 inch and 10-14 inch Big Horn Basin Precipitation Zone (Precip Zone). The average annual precipitation collected at the BLM Buffalo Creek rain gauge, located 6

miles south of the allotment, and is approximately 9.30 inches. Approximately one-half of the annual precipitation falls during the critical growing season of April through June.

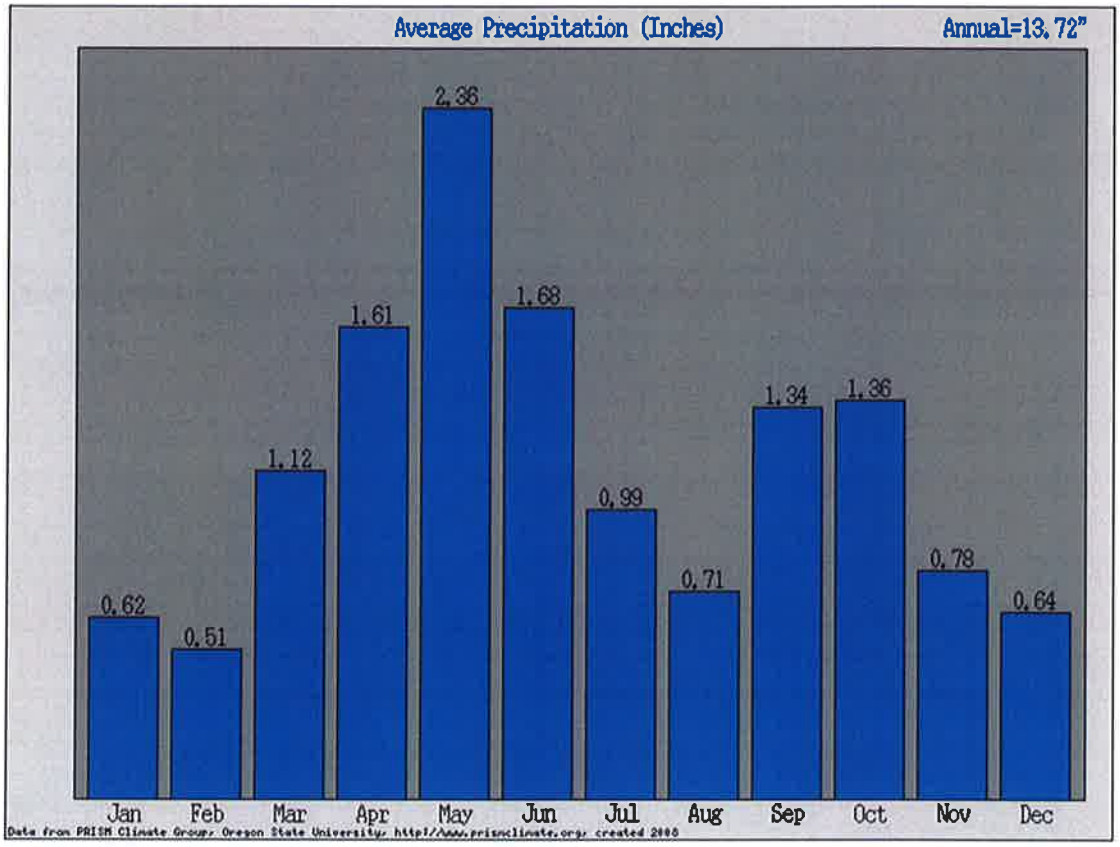
The following general climate description is provided by the US Department of Agriculture, Natural Resources Conservation Service (NRCS), Ecological Site Description, Loamy Range Site, 10-14E Big Horn Basin Precipitation Zone (Site ID R032XY322WY):

> 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.)
> For detailed information visit the Natural Resources Conservation Service National Water and Climate Center at http://www.wcc.nrcs.usda.gov/ website. Other climate station(s) representative of this precipitation zone include" Grass Creek 1E", "Thermopolis", Thermopolis 25NW", "Buffalo Bill Dam" and "Black Mountain".

An additional climate source is referenced to present overall climate data. According to the PRISM (Parameter-elevation Regressions on Independent Slopes Model), overall averages form monthly precipitation, mean annual precipitation, mean annual air temperature, have been sampled from 4 kilometer x 4 kilometer grid cell selected that is centered at 43.79857 N, 107.5063 W, that was approximated to be the average for the watershed . In total, 40 percent of the annual precipitation is during the months of April-June.



The maximum and minimum elevations for each allotment within the Buffalo Creek watershed were calculated along with the average slope given in percent rise for each 10 meter digital elevation grid. The Buffalo Creek allotment positioned at the top of the watershed and has the highest elevation of 6100 feet above sea level.

Allotment	Max Elev (ft)	Min Elev (ft)	Average Elev (ft)
Big Cedar	5303	4926	5104
Big Trails	5326	4657	4915
Blue Bank	5411	4871	5095
Buffalo Canyon	6243	5013	5599
Buffalo Creek	5150	4781	4948
Buffalo Sand Point	7051	4848	5468
Chalk Butte	5303	4915	5102
Deadline Draw	5212	4838	4996
Gordon	5210	4720	4878
Greed Individual	4909	4644	4743
Patras	6252	5380	5844
South Butte	5470	4967	5238
Willow Creek	6018	4982	5279

2.3 Soils

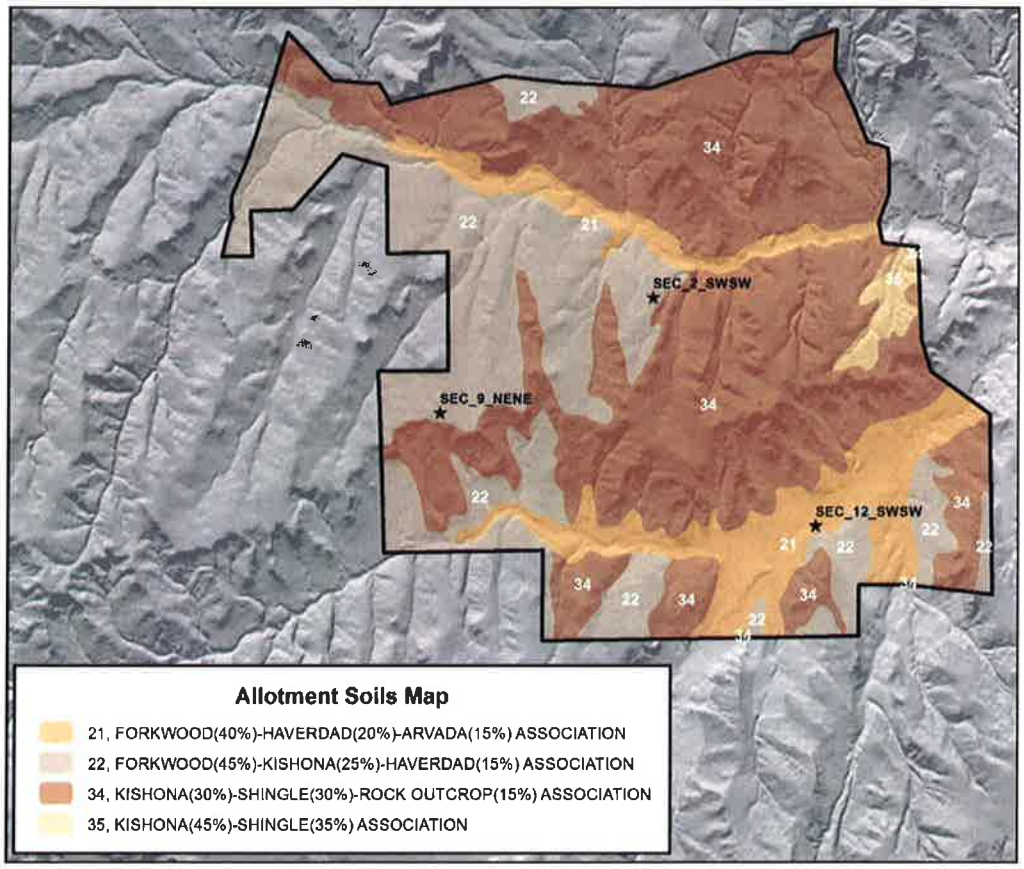
The soils reflect the desert environment in which they formed. They are highly variable, reflecting differences in parent material (shale, sandstone and/or mixed alluvium), position on the landscape, slope and aspect. Soil depth ranges from 1 inch to over 60 inches with sandstone and soft shale bedrock common below the substratum. The soils typically have a light brown surface layer. Loamy and sandy surface textures dominate most of the landscape. The subsoil often reflects an increase in clay being expressed as an argillic horizon. Increases in sodium are also common being reflected as a natric horizon in the subsoil. Slopes range from 0 to 60 percent, but are generally less than 30 percent.

The Buffalo Creek Allotment is within a transitional precipitation zone of 5-9 inch and 10-14 inch Precip. Zone as depicted by NRCS spatial data. Based on the soil survey data for Washakie County, the dominant soil units found in the allotment are listed below:

Soil Map Unit	Name	Acreage in Allotment	Characteristics	Ecological Site
21	Forkwood-Haverdad-Arvada	814	Forkwood soils are on terraces, alluvial fans, fan remnants, hills, ridges and pediments. Haverdad series consists of very deep, well drained soils formed in stratified alluvium on flood plains and low terraces. Arvada soils are on alluvial fans, fan remnants, fan terraces and hillslopes. Slopes are 0 to 25%	Loamy 10-14" R032XY322WY Saline Lowland 10-14" R032XY338WY Saline Upland 10-14" R032XY344WY
22	Forkwood-Kishona-Haverdad	1739	Forkwood soils are on terraces, alluvial fans, fan remnants, hills, ridges and pediments. Kishona soils are formed in alluvium on fan aprons, alluvial fans, fan remnants, hills, ridges terraces. Haverdad series consists of very deep, well drained soils formed in stratified alluvium on flood plains and low terraces.	Loamy 10-14" R032XY322WY, Lowland (LL) 10-14" R032XY328WY
34	Kishona-Shingle-Rock Outcrop	3244	Shingle series consists of well drained soils that are very shallow or shallow to bedrock. They formed in residuum and colluvium derived from interbedded shale and sandstone or in alluvium from mudstone. Shingle soils are on bedrock controlled hillslopes and ridges. Slopes are 0 to 80 %. Rock outcrop are exposures of shale and sandstone Kishona soils are formed in alluvium on fan aprons, alluvial fans, fan remnants, hills, ridges terraces. Kishona's lack argillic horizon.	Loamy 10-14" R032XY322WY Shallow Clayey 10-14" R032XY358WY Rock Outcrop
35	Kishona-Shingle	92		Saline Upland 10-14" R032XY344WY Shallow Clayey 10-14" R032XY358WY

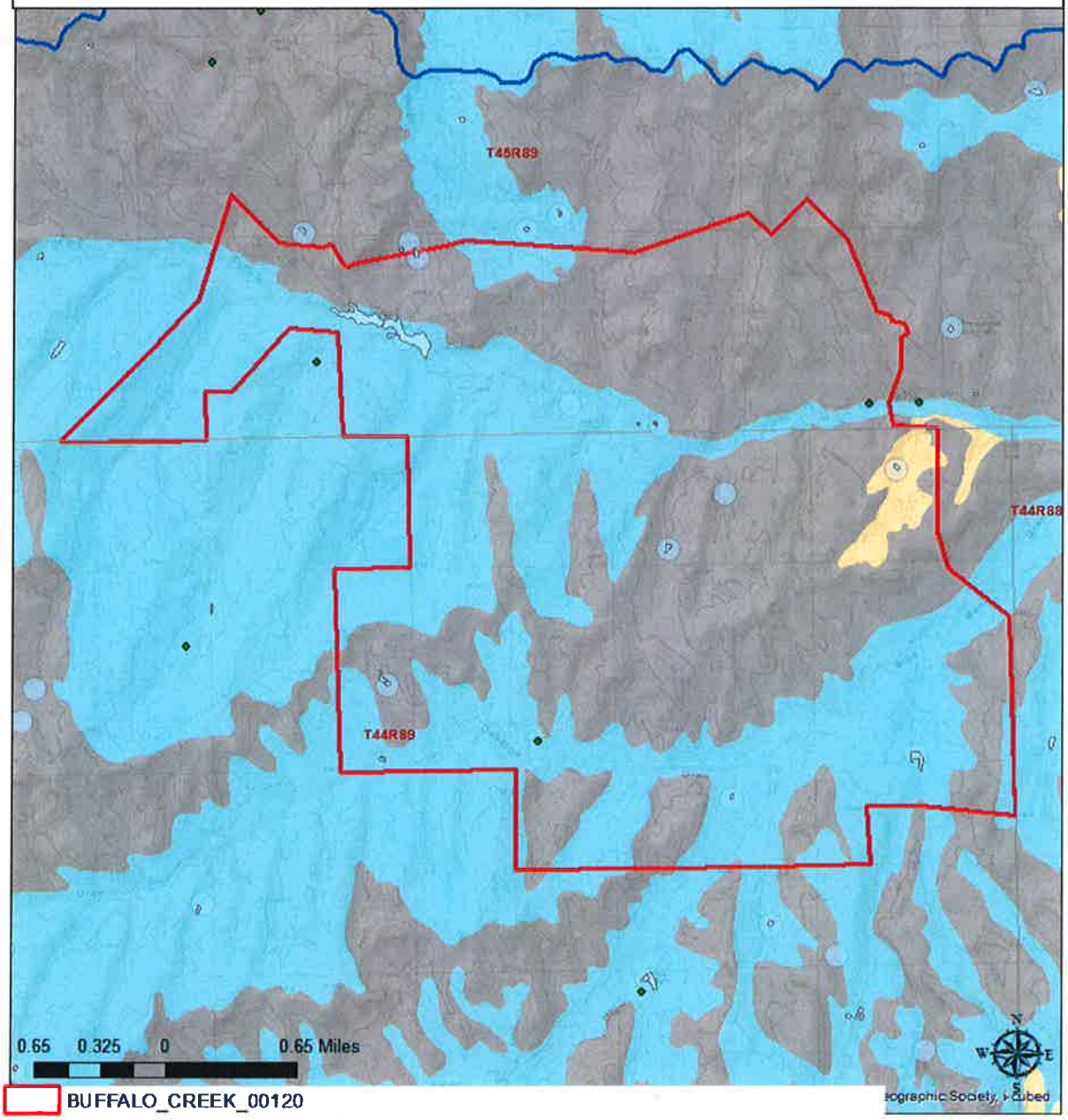
Three rangeland health assessments utilizing the methodology described in *Interpreting Indicators of Rangeland Health, BLM Technical Reference 1734-6*, were relied upon in the analysis of the Buffalo Creek Allotment. The assessments were conducted at monitoring sites selected for this analysis. The table below shows the soils and soil characteristic for each assessment site.

Soil Features	SEC 2_SWSW	SEC 9_NENE	SEC 12_SWSW
Soil Name	Forkwood	Forkwood	Haverdad
Parent Material Kind	sandstones and shales	sandstones and shales	sodic shale
Surface Texture	Silty Clay Loam	Fine Sandy Loam	Sandy Loam
Soil Stability Index	4.7	5.0	4.6



The soil hydrologic group map displays the distribution of the dominant soil hydrologic group that is assigned to the watershed. Group B type soils are those where the dominant soil type in the soil map unit contains moderate/high infiltration rates, locally in the watershed these areas are located within the floodplain area of Buffalo Creek and along the bases of sandstone rock outcrops. The group C soils are from loamy range ecological sites in the watershed. The group D soils are very common in the shallow loamy, badland sections of the watershed, and where shale rock out crops are common and or the depth to the bedrock is less than 50 centimeters. The Buffalo Creek allotment is dominated by group B and D type soils mixed throughout the allotment.

Buffalo Creek #00120 Dominant Soil Hydrologic Groups



BUFFALO_CREEK_00120

Buffalo Creek Watershed

Hydrologic Group

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet.

Group B. Soils having a moderate infiltration rate when thoroughly wet.

Group C. Soils having a slow infilatration rate when thoroughly wet.

Group D. Soils having a very slow infiltrtation rate (high runoff potential) when thoroughly wet.

2.4 Hydrology / Riparian

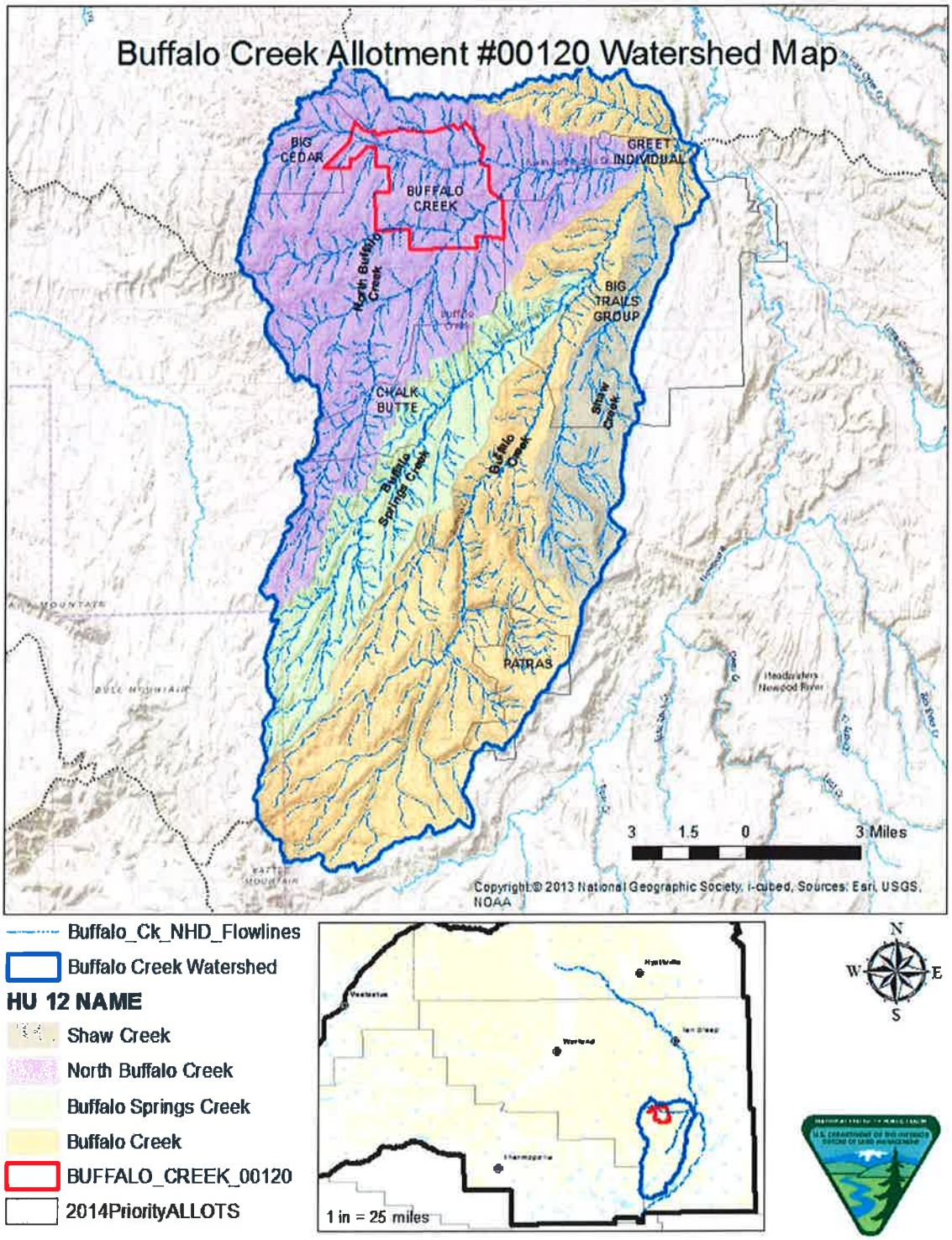
2.4.1 Surface Water/Watershed

The Buffalo Creek allotment is located within the Buffalo Creek USGS (level #5) watershed. The allotment contains the upper reaches of the North Buffalo Creek sub-watershed (level #6). The allotment consists of 14.9 % of the total area of the North Buffalo Creek sub-watershed.

Sub-Watershed Name (HU12)	**HUC 12**	**Acres**	**(mi)**	**Allot Acres**	**Allot mi²**	**% of Acres of Sub-watershed in the allotment**
North Buffalo Creek	100800080204	40283	62.94	5996	9.4	14.9
	Total:	40283	62.9	5996		

According to the USGS National Hydrography spatial dataset, the total length of ephemeral/intermittent channels for the Big Cedar allotment is 69 total kilometers that are within the North Buffalo Creek sub-watershed.

The main channel in the allotment is the North Fork Buffalo Creek and other tributaries that trend in north and southeastern directions (watershed map below).



Rainfall patterns in arid and semi-arid regions influence when stream flow is most likely (EPA, 2008). The high amount of ephemeral channels is indicative of the steep badland topography of the allotment in addition to infrequent storm events.

Rosgen Types- The channels within the Buffalo Creek watershed are dominantly Rosgen F5 type channels, which are described as entrenched, meandering channels which are deeply incised in valleys of relatively low relief such as

the Buffalo Creek sub-watershed. They contain highly weathered rock and erodible materials, and high lateral extension rates and bar deposition following infrequent storm events. These channel types generate naturally high bed-load and sediment transport rates and flow only in response to precipitation events between 2-5 percent of the total days in the average year (Hedman, 1983). Other less entrenched reaches of the Buffalo Creek and tributaries such as portions of the Nowood River are classified as Rosgen C5 channels, when healthy, where there is still periodic flooding and access to the floodplain from high flow events. Comparison of 1980 historic photo points with 2013 aerial photography has revealed active down-cutting of tributary channels with estimated advancement rates of one to two feet per year. The average main channel slope is the low (1.6 percent).

Drainage Pattern- The dominant land forming topographic process is from alluvial forces of erosion. The drainage pattern is a dendritic drainage pattern that reflects horizontal or slightly dipping sedimentary bedrock over which it was formed. The drainage density or amount of drainages per square mile is moderate, and high along steep shale rock outcrops of the allotment.

The following hydrograph was taken as part of the Nowood River Level I watershed study, where potential reservoir storage sites were analyzed and the inflows into the proposed sites were estimated based on runoff from the watershed. This hydrograph represents watersheds located west of the Nowood River at elevations ranging from 5000-6500 feet (Anderson,2009 p.3.38).

The gage is located approximately 2,900 feet upstream of the confluence of Buffalo Creek and the Nowood River. The site is located on lands owned by the State of Wyoming and accessed through the Greet Ranch. The Buffalo Creek watershed upstream of the gage is approximately 174.6 square miles. The gage was installed on March 12, 2009 and removed on November 11, 2009. Snowmelt runoff had not completely occurred when the gage was installed. Figure 3.44 displays the hydrograph measured at this site. Note the rise in the hydrograph beginning in October. This apparent increase in stream flow is the result of bank sloughing resulting in a shift in the gage rating curve resulting in a false reporting of higher flows.

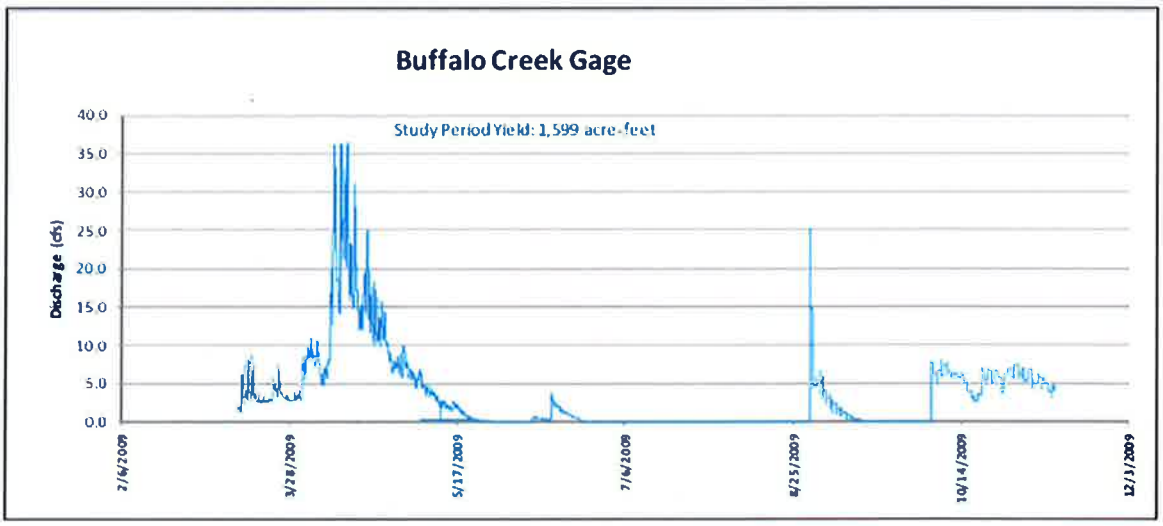


Figure 3.44 Buffalo Creek Hydrograph: March 14 through November 11, 2009

There are ten reservoirs that are found in the allotment. The reservoirs were assessed using 2001, 2009 and 2012 imagery. The status of each reservoir is outlined in the table below. These reservoirs when functioning capture and store runoff and sediment throughout the life of the project. The reservoirs were constructed primarily as a water source for grazing in the allotment.

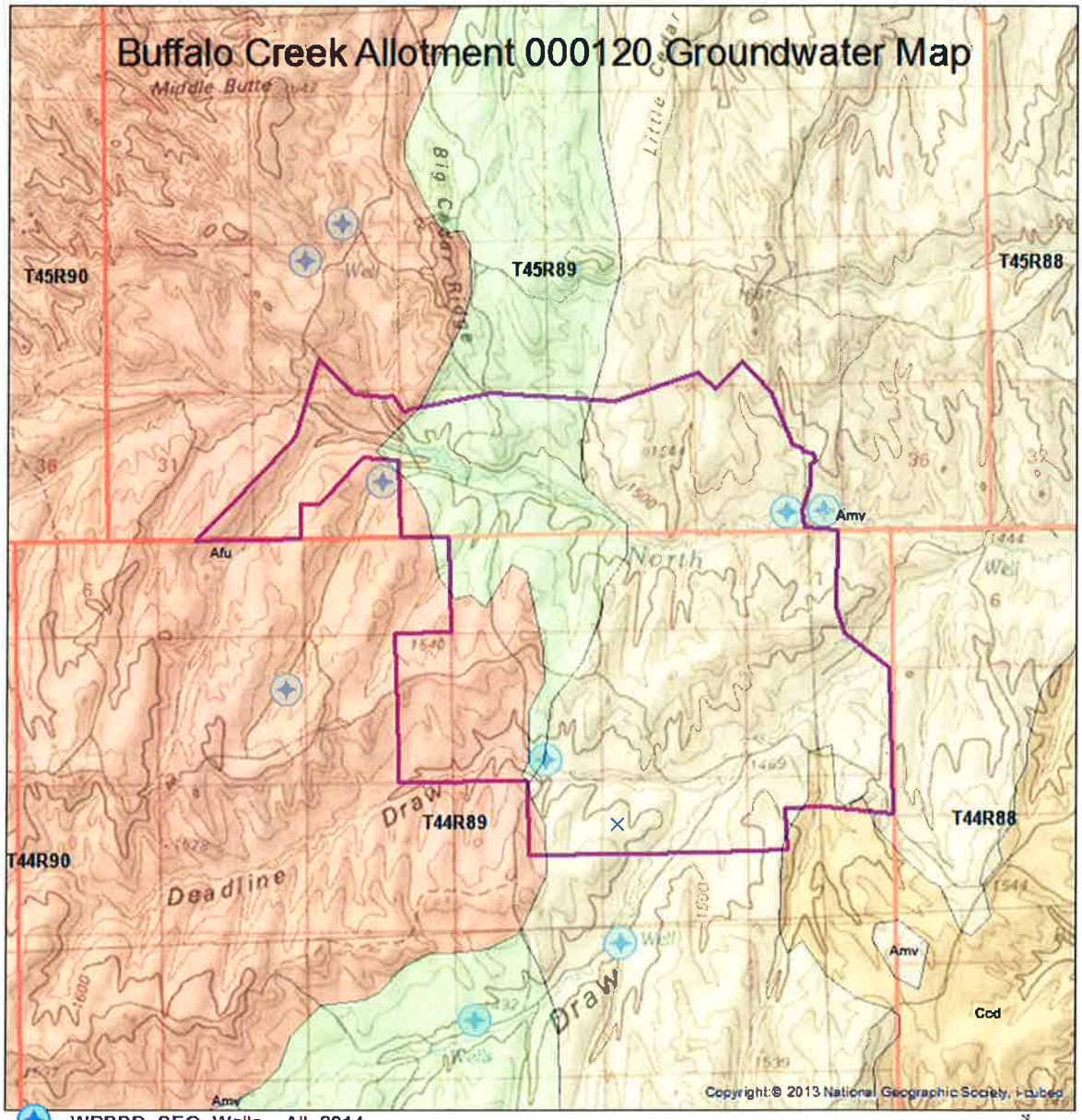
PROJECT_NAME	RANGE	TOWNSHIP	SECTION	SURFACE_ACRES	Comments	Status_2014
HARRY MILLS RES	089W	045N	34	0.36	Not found on imagery needs field verify	Unknown
BUFFALO #1 DET DAM	089W	045N	33	18.12	Functional	Water
TEASPOON RES	089W	045N	33	0.97	Functional	Water
LITTLE BUFFALO PIT	089W	045N	34	0.63	Functional	Dry
BUFFALO 1 RES	089W	044N	02	0.61	Semi-Functional	Dry
TOO DEEP RES	089W	044N	01	0.86	Semi-Functional	Dry
DUTCH RES	089W	044N	09	0.74	Semi-Functional	Dry
HOT SUN RES	089W	044N	14	0.34	Semi-Functional	Dry
MILLS STOCKWATER RES	089W	044N	12	1.68	Semi-Functional	Dry
M Mills Reservoir	089W	044N	12	0.45	Need to Verify	Unknown

2.4.2 Groundwater

The average annual minimum depth to groundwater is found along the floodplain areas of the main drainages and is mapped at a depth of 151-175 centimeters annually and greater than 175 centimeters for the Buffalo Creek allotment. There are no known springs or seeps in the allotment. According to Wyoming State Engineer records there are two water wells located in the allotment both are for stock water purposes.

APPLICANT	FACNAME	PRIORITY	STATUS	TOWNSHI	TNS	RANGE	RN	SECTION	QTRQTR	USES	YLDACT	S_DEPTH	W_DEPTH
USDI - BLM	DEAD LINE #4757	5/30/1974	FADJ	44	N	89	W	10	SWSE	STK	15	69	383
Wyo State Board	BUFFALO CREEK V	9/21/2000	COM	45	N	89	W	35	SWSE	STK	25	20	35

Ground-water recharge in arid and semi-arid regions has generally been viewed as the sum of several different distinct pathways including mountain-block recharge, mountain-front recharge, spatially distributed recharge, and ephemeral stream channel recharge. Recent research has expanded this view to include the mediating role of vegetation (i.e. water use by vegetation), and the greater role of ephemeral stream channel recharge in basin floors (EPA, 2008 p.22). The ground-water recharge for this watershed is likely in the form of ephemeral stream channel recharge.



WRBBD_SEO_Wells__All_2014

BighornBasin_HydroGeologic_WSGS

AQUIFER, HYDRO_SYMB

- Cody Shale confining unit, Ccd
- Fort Union aquifer, Afu
- Mesaverde aquifer, Amv
- undefined Mesozoic hydrogeologic units,
- BUFFALO_CREEK_00120

0 0.2750.55 1.1 1.65 2.2 Miles

2.4.3 Water Quality (Surface)

The main drainages such as Buffalo Creek are classified by the Wyoming Department of Environmental Quality (DEQ) as class 3B type streams. The associated beneficial uses for class 3B streams are found in the table below. This is the default rating given by the DEQ and this stream flows on average three to four weeks annually and is considered ephemeral. DEQ defines "these streams support other aquatic life, recreation, wildlife, agriculture, industry, and provide scenic value throughout portions of the year".

Wyoming DEQ Surface Water Use Class and TMDL Summary

	WY DEQ Use Designations									
Surface Water Classes	Drinking Water	Game Fish	Non-Game Fish	Fish Consumption	Other Aquatic Life	Recreation	Wildlife	Agriculture	Industry	Scenic Value
2AB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2C	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3B	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes

2.4.4 Riparian

The flow regime of the main drainages within the Buffalo Creek watershed is typically intermittent with flow occurring in the channel following snow-melt runoff and following storm events. The hydrograph as presented for Buffalo Creek suggests there is little to no flow available during the growing season to support a riparian area.

There is little to no herbaceous riparian vegetation along the creek (in the parafluvial zone) due to lack of available free water during the growing season in the upper sections of the soil profile at or near the high water mark and surrounding the floodplain. In Colorado and Wyoming, moderately high flows that occur every 5 years are required to create the new point bars where plains cottonwood establishes [72]. Seedlings will establish close to the edges of river channels, but will probably not survive future ice jams and high discharges. The long-term survival of seedlings established during flood-free periods is greater the higher above stream channel they are established [179].

There are 10 total reservoirs, 9 of which are designated Range Improvement Projects (RIPS), and one historic reservoir with no project record. Some of the drainages and reservoirs that are capable of impounding runoff water frequently develop riparian characteristics as a result.

2.5 Upland Vegetation

The uplands and drainages throughout the allotment are made up of a variety of shallow and saline range sites. The main sites include: Rock Outcrop, Saline Upland, Shallow Loamy, and Loamy sites making up the majority of the allotment acres.

Plant composition within the allotment observed on the transect and generally thoughout the allotment included: Needle&Thread (*Hesperostipa comata*), Bluebunch wheatgrass (*Pseudoroegneria spicata*), prairie Junegrass *(Koeleria macrantha),* Sandberg bluegrass (*Poa secunda*), Western wheatgrass (*Pascopyrum smithii)*, Cheatgrass (*Bromus Tectorum*), Plains pricklypear (*Opuntia polyacantha*), Scarlet globemallow (*Sphaeralcea coccinea*), sego lily (Calochortus nuttallii), Textile onion (*Allium textile*), Hood's Plox *(Phlox hoodii),* Wyoming big sagebrush *(Artemisia tridentata ssp. wyomingensis*), and greasewood (*Sarcobatus vermiculatus*)This list is not all inclusive; however the vegetation noted are those that are quite evident and readily found. Cheatgrass *(Bromus tectorum),* field brome *(Bromus arvensis)* and numerous annual forbs were found to be the most common and dominate plants in the allotment. No known threatened or endangered plant species have been documented in the allotment.
In 1996 the Buffalo Creek #1 and Buffalo Creek #2 Wildfires burned 300 acres of the upper northwestern portion of the allotment. This area underwent an increase in cheatgrass (*Bromus Tectorum*) and Field brome (*Bromus aversis*).

2.6 Invasive Species

Noxious weed species inventoried within the allotment include saltcedar (*Tamarix chinensis*) around reservoirs holding water. Cheatgrass (*Bromus tectorum)* has become established and is the moderately abundant in most of the allotment.

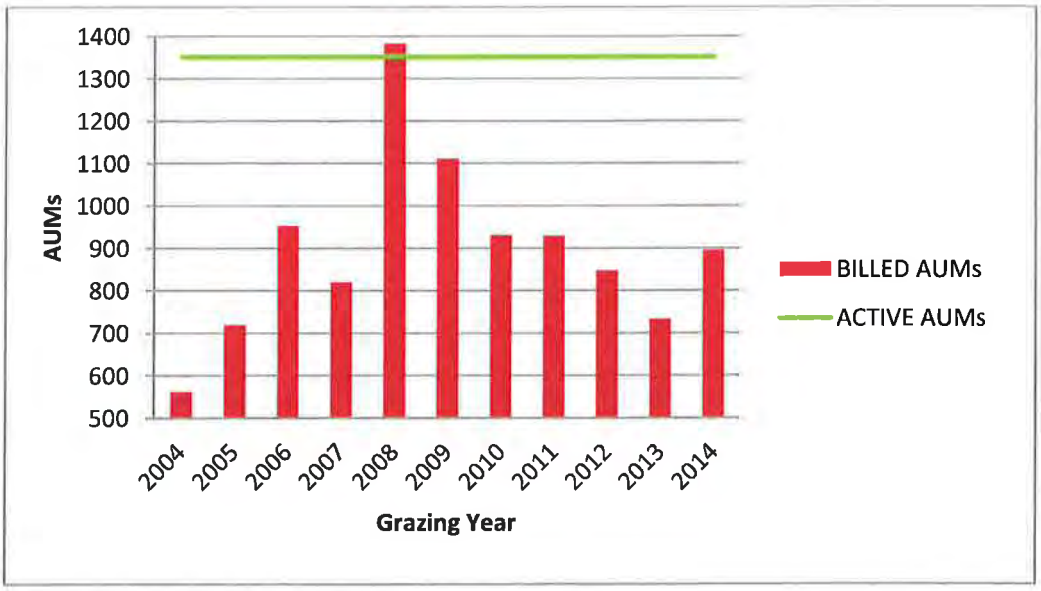
2.7 Livestock Grazing Management

The Buffalo Creek Allotment is a common allotment with two authorizations. It is permitted for cattle grazing in the spring and winter. A total of 1,351 animal unit months (AUMs) of livestock grazing use are permitted as follows:

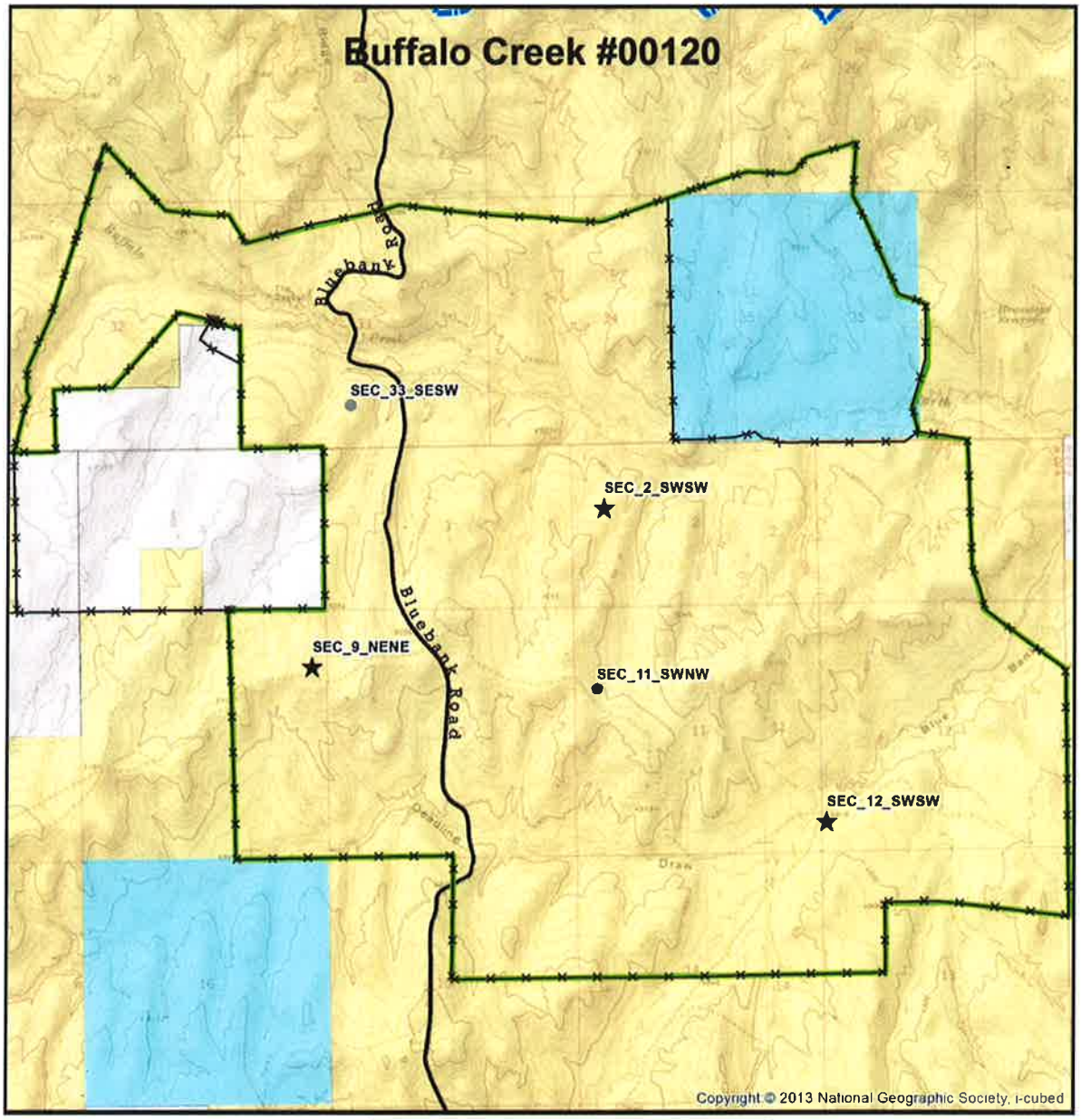
Operator	Livestock Numb.	Livestock Kind	Begin	End	PL%	AUMs
Mascaro	122	Cattle	4/21	6/20	100	245
	7	Horse	11/16	2/4	80	15
	61	Cattle	11/16	2/6	100	166
Brubaker	150	Cattle	4/21	6/20	100	301
	186	Cattle	11/1	2/10	100	624

Calculated livestock grazing, as indicated through billing records, is summarized in the table and chart below.

Livestock Grazing Use			
Year	Estimated Use (AUMs)		
	Spring	Winter	Total
2004	195	366	561
2005	385	333	718
2006	385	567	952
2007	373	446	819
2008	577	805	1382
2009	513	597	1110
2010	292	638	930
2011	394	534	928
2012	509	337	846
2013	390	342	732
2014	560	334	894
Average	416	482	897



Since 2004, livestock grazing use has averaged 76% of permitted use in the spring, 60% of permitted use in the winter, and 66% of permitted use overall.



S&G Assessment
Monitoring point
Fence
Buffalo Creek Watershed
Allotment Boundary
Bureau of Land Management
Private
State

WORLAND FIELD OFFICE

2.8 Wildlife

Wildlife habitat on the Buffalo Creek allotment is suitable for a wide range of big game, non-game, and sensitive wildlife species. The allotment is characterized primarily by gently sloped sagebrush plains with smaller draws and some badland interface. The vegetation is characterized by a mix of Wyoming big sagebrush, perennial grasses, and cheatgrass, with components of salt tolerant brush species with sandberg bluegrass and bluebunch wheatgrass. Mule deer and antelope use the allotment year round with higher concentrations of mule deer utilizing it during late fall and winter. Nearly the entire allotment is designated as crucial big game winter habitat for mule deer and antelope. The allotment also provides habitat for a wide range of wildlife species such as small mammals and predators, numerous grassland passerines, Sage grouse, prairie dogs, and raptors.

2.9 Threatened, Endangered, Candidate, or Sensitive Species

No known threatened or endangered species have been identified on the allotment, however Greater Sage grouse can be found there at various seasons of the year. There is one active Sage grouse lek within the allotment boundary which has had consistent breeding activity recorded over an extended period beginning in 1983. The entire allotment is within designated Sage grouse core breeding area and most of the allotment has been identified as a winter concentration area for Sage grouse. Various additional sagebrush obligate avian species such as the Sage sparrow, Brewer's sparrow, and Sage Thrasher may also utilize habitat within the allotment. At least two White-tailed praire dog colonies have been identified in the northwestern portion of the allotment near Buffalo Creek.

3.0 Summary of Monitoring Data / Assessments

In the summer of 2014, one monitoring site was selected in the allotment as part of the Rangeland Health Assessment process. Ecological site, soil type, vegetative community, topography, location of water sources, and livestock grazing history are some of the factors that were considered in the selection of these monitoring sites. The allotment map in section 2.7, illustrates the monitoring site locations. Photographs of each assessment site are located in section 3.4.

3.1 Monitoring Data

Rangeland Health Assessments were conducted at the monitoring sites by an interdisciplinary team using the 17 Indicators of Rangeland Health as described in BLM Technical Reference 1734-6. Field observations were compared to the Reference Sheets appropriate for that range site to determine departures from normal. Individual ratings for the *Rangeland Health Indicators* are displayed for each monitoring site below.

Rangeland Health Indicators			
Indicator	**Departure from Reference Sheet**		
	SEC 2_SWSW	**SEC 9_NENE**	**SEC 12_SWSW**
1. Rills	S-M	N-S	N-S
2. Water-flow patterns	M	N-S	N-S
3. Pedestals and/or terracettes	S-M	S-M	N-S
4. Bare ground	S-M	S-M	N-S
5. Gullies	S-M	S-M	S-M
6. Wind-scoured, blowouts, &/or deposition areas	N-S	N-S	N-S
7. Litter movement	S-M	N-S	N-S
8. Soil surface resistance to erosion	N-S	N-S	N-S
9. Soil surface loss or degradation	S-M	N-S	S-M
10. Plant community composition & distribution relative to infiltration	M	S-M	S-M
11. Compaction layer	N-S	N-S	S-M
12. Functional / structural groups	M	M	M
13. Plant mortality / decadence	N-S	N-S	N-S
14. Litter amount	S-M	N-S	N-S
15. Annual production	N-S	N-S	N-S
16. Invasive plants	N-S	M	M-E
17. Reproductive capability of perennial plants	N-S	N-S	M-E
Indicator Summary	**SEC2_SWSW**	**SEC 9_NENE**	**SEC 12_SWSW**
Soil / Site Stability *(Indicators 1-9, 11)*	**S-M**	**N-S**	**N-S**
Hydrologic Function *(Indicators 1-5, 8-11, 14)*	**S-M**	**N-S**	**N-S**
Biotic Integrity *(Indicators 8, 9, 11-17)*	**N-S**	**N-S**	**M**
N-S: None to Slight S-M: Slight to Moderate M: Moderate M-E: Moderate to Extreme E-T: Extreme to Total			

3.2 Soils and Site Stability

Data collected for the Rangeland Health Assessments were used to evaluate soil and site stability on the allotment. Standard 1 for Healthy Rangelands was evaluated based on the attribute ratings for *Soil and Site Stability* using rangeland health indicators 1 through 9 and 11.

SEC 2_SWSW Assessment Site

The overall Soil and Site Stability rating for this sight was averaged to have a Slight to Moderate departure from the reference state for a Shallow Loamy 10-14" site. The indicator evaluation matrix field notes are summarized as followed: Active rill formations were noted as small in interspaces that were very short (<2ft) and widely spaced. Water-flow patterns were common and most abundant around cattle trails and roads. Pedestals of 1 to 2 inches were found around sagebrush and bunchgrasses within water flow patterns. Bare ground areas were small but connected via water flow patterns. Gullies were uncommon with few signs of active nick points on some cattle trails and roads. No wind scoured, blowouts or depositional areas present. Litter movement matched what was expected for the site with some small size classes being displaced in water f low patterns. Soil surface resistance to erosion (SSI) on this site was strong at 4.7. Soil surface loss and degradation was slightly reduced throughout the site indicated by a 2-3 inch 'A' horizon. Most degradation was within plant interspaces. No evidence of compaction layers. Litter amount was low in interspaces and less than expected at only 2 percent.

SEC 9_NENE Assessment Site

The overall Soil and Site Stability rating for this sight was averaged to have a None to Slight departure from the reference state for a Loamy 10-14" site. The indicator evaluation matrix field notes are summarized as followed: Active rill formations and water-flow patterns were not observed on the site. Pedestals were present but matched

what was expected for the slope on the site. Bare ground was 29 percent and higher than indicated on the reference sheet. Bare areas were mainly 6 to8 inches in diameter and not connected. Gullies were present but stable and uncommon, located only around roads and trails. No wind scoured or blowout/depositional areas were observed. Litter movement matched what was expected for the site and evenly distributed. Soil surface resistance to erosion (SSI) on this site was 5.0; the reference sheet places the average SSI at 3.0 or greater. There were no signs of soil surface loss, degradation, or compaction layers. Litter amount matched what was expected at 28.5 percent interspace cover.

SEC 12_SWSW Assessment Site
The overall Soil and Site Stability rating for this sight was averaged to have a None to Slight departure from the reference state for a Saline Upland 10-14" site. The indicator evaluation matrix field notes are summarized as followed: Rills were not present. Water flow patterns were confined to ephemeral drainage bottoms and none found on Terrence ways. Slight pedestaling was observed around greasewood plants but didn't appear to be active. Bare ground was 13 percent and mostly in small unconnected patches of less than 6 inches. Gullies were active and unstable along the main ephemeral drainage. No wind-scoured, blowout, or deposition areas were observed. Smaller classes of litter showed signs of movement but matched what was expected for the site. Soil surface resistance to erosion was strong with an index of 4.6 compared to the 3.5 index on the reference sheet. Soil surface loss and degradation was slightly reduced throughout the site indicated by a 1.5 inch 'A' horizon. A compaction layer was observed in the very tops of the soil pits in areas of higher livestock concentration. Litter amount matched what was expected at 27 percent interspace cover.

3.3 Hydrology

3.3.1 Surface Water
According to the hydrograph that was presented in 2.3.1 for Buffalo Creek, the majority of the flow in the channels is during late March and April with little to no flow in the channel from May through September. The upland drainages in the allotment are on a dip slope with moderate amounts of infiltration and minimal runoff. The amount of runoff from the allotment is correlated with the soil and hydrologic indicators using the *Rangeland Health Indicators as presented above in section 3.1.* The overall soil and hydrologic function indicators at two of the monitoring sites were rated with a none to slight from the reference conditions as described above. This suggests that the timing and amount of runoff from upland areas varies according to the condition of the ecological site. The erosional observations for the hydrology are linked with the soil indicators as described above in section 3.2. The other site was rated as a slight to moderate departure from reference conditions.

The reservoirs that have been constructed in the allotment provides a water source in portions of the allotment that otherwise would not have water sources. These reservoirs have altered grazing patterns in the allotment.

Human Influence:
The historic construction of the reservoir in the allotment has changed the flow pattern of the drainage. When functioning, the reservoirs trap and store sediment that otherwise would be delivered downstream. When reservoirs become in disrepair the release the previously stored sediment and often create head cuts or changes in the channel geometry that can cause excessive erosion. The reservoir in this allotment has a minimal impact to the surface water runoff of Buffalo Creek. Other anthropogenic disturbances that alter runoff conditions such as roads are minimal in this allotment.

3.3.2 Ground Water
Any potential groundwater recharge would occur in where the MesaVerde aquifer is present and form infiltration along drainages. Currently there is no demand for additional groundwater in the allotment that would have an impact to rangeland conditions. The current ground water use in the allotment is acceptable and no issues were identified.

3.3.3 Water Quality
BLM Observations:
Due to the flow regime of the channel, there has been no specific data gathered for this allotment. The following are was taken from the Nowood Level I study.

"The Bureau of Land Management (BLM) in Wyoming is partnering in the implementation of several section 319 watershed plans statewide as part of their Watershed and Water Quality Improvement efforts. Given the distribution of private, state and federal (primarily BLM) lands within the Nowood watershed, this type of partnering may be applicable to future BMP projects that might best be implemented across land ownerships (Anderson,2009 p. 7.4).

Wyoming DEQ:
It is anticipated that as the Wyoming Department of Environmental Quality (WDEQ) continues the inventory of waters of the State and the identification of Impaired and/or Threatened water bodies, BLM will be partnering with the WDEQ to improve water quality in water bodies on Public Lands. In the course of developing watershed plans or TMDL's for these watersheds, BLM will be routinely involved in watershed health assessments, planning, project implementation and Best Management Practice (BMP) monitoring.

Anthropogenic uses and activities on the landscape can have significant impacts – both adverse and beneficial– on water quality and the health of a watershed. Human-related disturbances are numerous and include livestock grazing, land clearing, mining, timber harvesting, ground- water withdrawal, stream flow diversion, channelization, urbanization, agriculture, roads and road construction, off-road vehicle use, camping, hiking, and vegetation conversion. Biological stressors include habitat loss, alteration, effluent discharge, and degradation from decline in water quality, and changes in channel and flow characteristics (EPA, 2008 p.65). These types of indicators are taken into consideration for standard 5 evaluations.

3.3.4 Riparian
There are no naturally occurring riparian areas that are located within the allotment. The only riparian areas are the reservoirs in the allotment that are discussed in the surface water section 3.3.1.

3.4 Upland Vegetation
Data from the line intercept cover transects, the 17 Indicators of Rangeland Health, and other field observations were used to evaluate the vegetative community on the allotment. Standard 3 for Healthy Rangelands was evaluated based on the attribute ratings for Biotic Integrity using rangeland health indicators 8 through 9, and 11 through 17.

Not all the sites monitored on this allotment fit clearly into any of the plant community types described in the Ecological Site Description. The vegetative components described in the *Perennial Grass/Big Sagebrush Plant Community* are present on these sites, although not in the desired abundance. While the desirable perennial grasses if found on these sites exhibited good vigor and seed production, it appears that they are struggling to successfully compete with cheatgrass. Since vegetative trend studies have not been conducted on the allotment, it is not known whether the amount of cheatgrass is increasing, decreasing, or remaining stable. Any increase in the amount of cheatgrass on these sites would likely correspond to a decrease in the frequency of desirable perennial grasses. This would likely have the effect of pushing these sites into an ecological state similar to the *Big Sagebrush/Bare Ground Plant Community* type, with cheatgrass replacing the bare ground component. Due primarily to the decreased perennial grass component, and the high occurrence of cheatgrass in the allotment, the *Biotic Integrity* at each site monitored in the allotment was rated as a "Moderate" departure.

The vegetative community, ground cover, and soil surface attributes for the assessment sites were noted, measured, and compared to the ecological site description (ESD) and corresponding reference sheet. The sites were compared to the Loamy 10-14 inch precipitation zone, Shallow Loamy 10-14 inch precipitation zone, and the Saline Upland 10-14 inch precipitation zone ESD's.

Loamy
The Historic Climax Plant Community (HCPC) for a Loamy ecological site is a Bluebunch Wheatgrass/ Rhizomatous Wheatgrass plant community. This community would be dominated by cool season grasses (75%) followed by a nearly even balance of forbs (10%) and woody species (15%). With moderate continuous season long grazing or extended droughts a transition from HCPC to a Perennial Grass/Big Sagebrush state may occur. This state is dominated by cool season grasses but short warm season grasses and various forbs are present and shrubs would be a conspicuous part of the site. The state has a hydrologic, soil, and biotic community that is stable and intact. From this state, with frequent and severe grazing, lack of fire, extended droughts or severe grazing in

conjunction with wildfire or brush control the vegetative state can be converted to a blue grama sod community, a Big Sagebrush/Bare Ground community or a salt tolerant shrub/ bare ground community and from there to a salt tolerant shrub/rhizomatous wheatgrass state.

States beyond the Perennial grass/Big Sagebrush 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 is diminished without mechanical treatments, reseeding efforts, soil remediation efforts, and intense grazing management.

Shallow loamy
The Historic Climax Plant Community for a shallow loamy ecological site is a Bluebunch wheatgrass/Rhizomatous wheatgrass/Needleandthread plant community. This community would be dominated by cool season grasses (75%) followed by a nearly even balance of woody species (15%) and forbs (10%). With moderate continuous season long grazing or extended droughts a transition from HCPC to a Perennial Grass/Mixed shrub state may occur. This state is dominated by cool season grasses but shrubs, blue grama, and cactus may have invaded but only in small areas. Bluebunch may have decreased and species like Indian ricegrass (if it did occur on site) may be in protected areas only. The state has a hydrologic, soil, and biotic community that is stable and intact. From this state, with frequent and severe grazing, lack of fire, extended droughts, or a severe grazing in conjunction with wildfire, the vegetative state can be converted to a mixed shrub/bare ground community, a blue grama sod community, a salt tolerant shrub/rhizomatous wheatgrass community, or a salt tolerant shrub/bare ground community.

States beyond the Perennial grass/Mixed shrub 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 is diminished without mechanical treatments, reseeding efforts, soil remediation efforts, and intense grazing management.

Saline Upland
This transect was compared to the Saline Upland 10-14 inch precipitation zone (R032XY344WY). The Historic Climax Plant Community for this ecological site is a Gardner's saltbush /Indian ricegrass/Bottlebrush squirreltail plant community. This community would be dominated by Gardner's saltbush and grasses such as Indian ricegrass, bottlebrush squirreltail, and wheatgrass species. There should be a split of about 40% woody species, 50% grasses and 10% forbs. This state tolerates drought well but it is a fragile state that once damaged is difficult to re-establish. With moderate continuous season long grazing from HCPC to a Gardner's saltbush/wheatgrass community. This state is dominated by cool season grasses and Gardner's saltbush but Indian ricegrass and winterfat have decreased. Plants such as cactus and birdsfoot trefoil would have increased. The state has a hydrologic, soil, and biotic community that is stable and intact. From this state, with frequent and severe grazing the vegetative state can be converted to mixed shrub/blue grama community or Gardner's saltbush/bare ground community.

States beyond the Gardner's saltbush/wheatgrass 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 is diminished without mechanical treatments, reseeding efforts, soil remediation efforts, and intense grazing management.

A summary of the cover data collected is shown in the table below:

Vegetation Monitoring Data						
Monitoring Site	**Ecological Site 10-14"p.z.**	**Basal Veg. Cover**	**Interspace Litter**	**Bare Ground**	**Sagebrush Presence**	**Brte presence ((hits/transect pts)*100)**
SEC 2_SWSW	Shallow Loamy	12	2	17	26	8
SEC 9_NENE	Loamy	21	28.5	14.5	22	7
SEC 12_SWSW	Saline Upland	20	27	13.5	2	14

Cheatgrass presence is derived from total "hits" on cheatgrass, canopy or basal, throughout the transect. It is a representation of the amount times the plant was encountered along a transect in relation to the amount of points observed on the transect.

SEC 2_SWSW

All of the indicators evaluated were averaged to have a "None to Slight" departure from the reference state for a Shallow Loamy 10-14" site. The dominant functional/structural groups at this monitoring site based on cover is 31% cool season bunchgrasses, 30% annual forbs and cheatgrass, 21% perennial shrubs, 17% mid stature rhizomatous grasses, and 2% perennial forbs. This plant community is considered to be within the Perennial Grass/Big Sagebrush state. Cheatgrass and other annual plants have impacted the desirable community degrading or altering the functional structural groups. Litter cover, Annual production, and reproductive capability all matched what was expected for the site potential and weather patterns.

SEC 9_NENE

All of the indicators evaluated were averaged to have a "None to Slight" departure from the reference state for a Loamy 10-14" site. The dominant functional/structural groups at this site base on percent cover is: 43% perennial shrub, 43% mid stature rhizomatous and poa grasses, 12% annual grasses, and less than 5% cool season bunch grasses/forbs. This plant community is considered to be within the Perennial Grass/Big Sagebrush state. Cheatgrass and other annual plants have impacted the desirable community degrading or altering the functional structural groups. Litter cover, Annual production, and reproductive capability all matched what was expected for the site potential and weather patterns

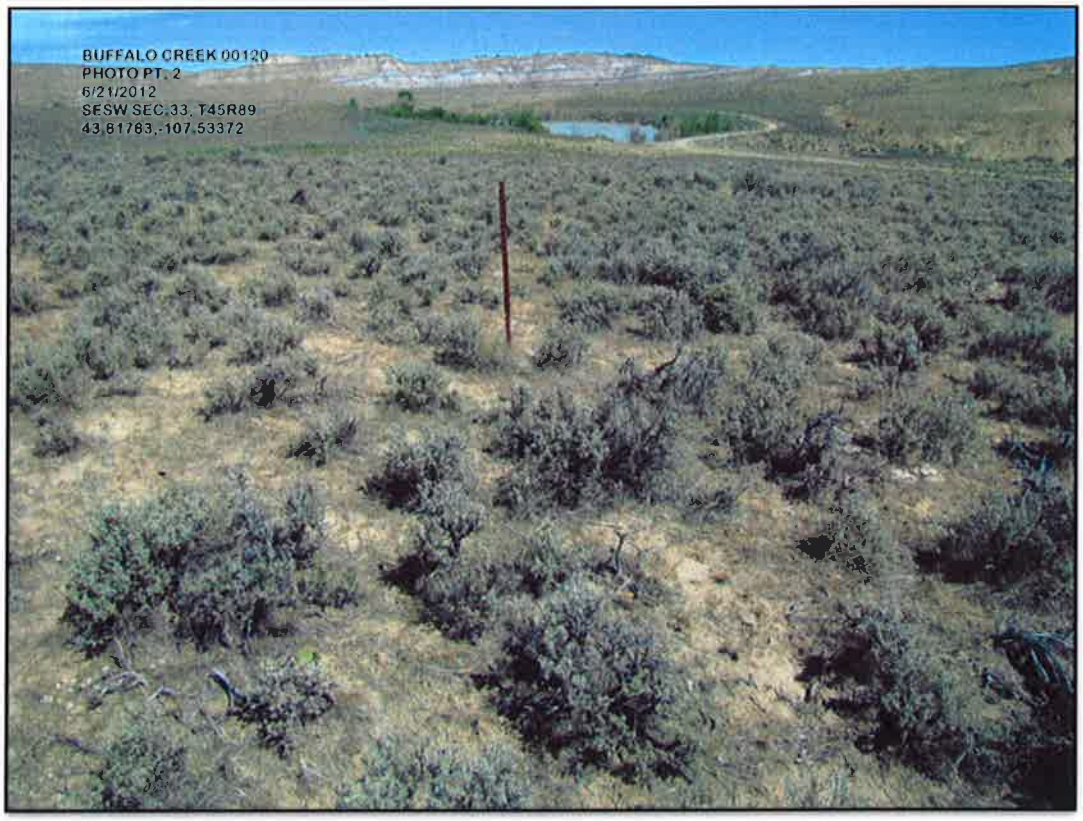
SEC 12_SWSW

All of the indicators evaluated were averaged to have a "Moderate" departure from the reference state for a Saline Upland 10-14" site. The dominant functional/structural groups at this site base on percent cover are: 28% mid stature rhizomatous/poa grasses, 14% perennial shrubs, 13% annual grasses, and no cool season bunch grasses or perennial forbs. This plant community is considered to be similar to the Gardner's saltbush/Rhizomatous Wheatgrass state. Cheatgrass and other annual plants have impacted the desirable community degrading or altering the functional structural groups. Litter cover, Annual production, and reproductive capability all matched what was expected for the site potential and weather patterns.

Additional Observations

The sites selected for additional monitoring, shown in the photos below, were determined to be representative and supportive of the findings associated with the Rangeland Health assessment sites.

DATE
DIST
ALLOT
PASTURE
PLOT NO

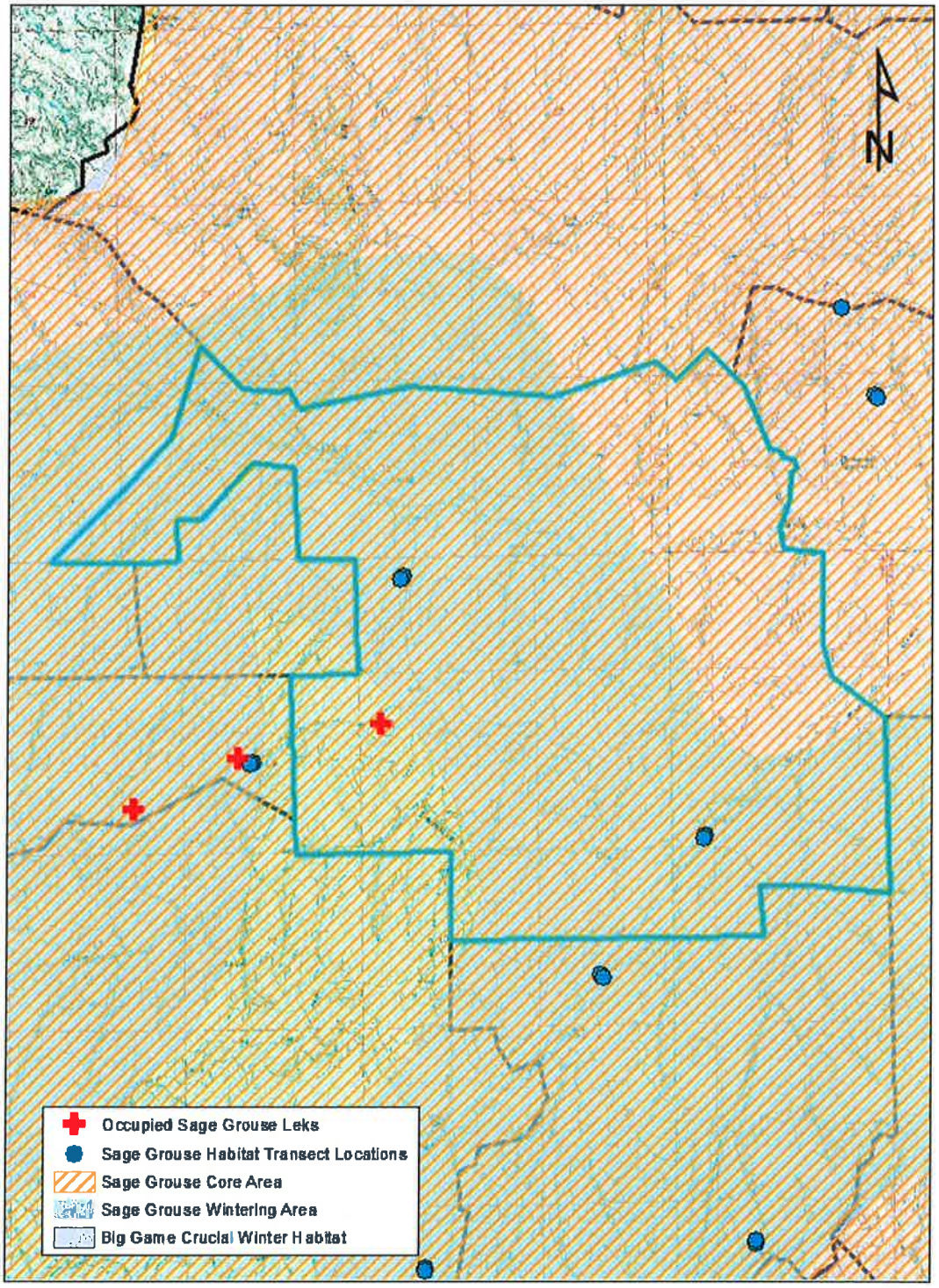

BUFFALO CREEK 00120
PHOTO PT. 2
6/21/2012
SESW SEC.33, T45R89
43.61783,-107.53372

3.5 Wildlife Habitat

Wildlife habitat on the Buffalo Creek allotment is characterized by a Perennial Grass/Big Sagebrush plant community. The area is gently sloping with the North Fork of Buffalo Creek flowing east toward Nowood Creek being the main drainage. The habitat particularly favors pronghorn antelope, which can be found there throughout the year. Mule deer are also found on the allotment with higher concentrations during the winter months. Two separate habitat assessment transects representative of the Sage grouse habitat on the allotment were conducted during the growing season of 2014 to determine and record the canopy cover, brush height, and vegetation components of the wildlife habitat on the allotment. Live sagebrush canopy cover was determined to range from 14 to 17 percent at the two transect points, and sagebrush height averaged approximately 13 inches. Belt transect surveys determined the mature sagebrush component to average 69 percent over the two transects, indicating vigorous sagebrush growth appropriate for a Perennial Grass/Big Sagebrush habitat in this precipitation zone. These measures indicate viable habitat to sustain the numerous sagebrush obligate and native wildlife species that can be expected to be found at this site.

There is one active Sage grouse lek within the allotment boundary. Observations have been recorded of breeding activity on the lek by Sage grouse dating as far back as 1983, with highest numbers of male birds observed in 2000 (78 males). Breeding activity has been recorded consistently across the past approximately twenty five years, indicating continued use by Sage grouse.

Buffalo Creek Allotment Wildlife Habitat Map



Sage grouse Habitat Transect #1					
Date: 5/20/14_ Observers: Ken Stinson, Jim Andersen Allotment Name : Buffalo Creek Location: LAT/LONG N 43'48.808 W 107'31.845					
Line Intercept Canopy Cover					
Species		**% Cover**			
Live Big Sagebrush		14			
Dead Big Sagebrush					
Other SPP: (Fringed)					
Other SPP: (Rabbit Brush)					
Shrub Species		**Average Height in inches**			
Live Big Sagebrush		9.8			
Other SPP: (Gardner Saltbush)					
Other SPP: (Bud Sage)					
Belt Transect					
Species	**%Young**	**%Mature**	**%Decadent**	**%Dead**	
Big Sagebrush	0	68	22	10	
Gardner Saltbush					
Bud Sage					
Daubenmire Cover Class & Vegetation Height Data					
Summary of Vegetation Height	New Herbaceous Mean Ht: 9.3 "		Residual Herbaceous Mean Ht: 1.3 "		
Summary of Cover Class (%)	New Perennial Grasses: 14.75 %	New Annual Grass: 1.16%	Perennial Forb: 3.5 %	Residual Herbaceous: 2%	Other: 52.25 %
Browse Utilization					
ARTR			Low		

Sage grouse Habitat Transect #2					
Date: 5/23/14_ Observers: Ken Stinson, Jim Andersen Allotment Name : Buffalo Creek Location: LAT/LONG N 43'48.808 W 107'31.845					
Line Intercept Canopy Cover					
Species		**% Cover**			
Live Big Sagebrush		17			
Dead Big Sagebrush					
Other SPP: (Fringed)					
Other SPP: (Rabbit Brush)					
Shrub Species		**Average Height in inches**			
Live Big Sagebrush		15.6			
Other SPP: (Gardner Saltbush)					
Other SPP: (Bud Sage)					
Belt Transect					
Species	**%Young**	**%Mature**	**%Decadent**	**%Dead**	
Big Sagebrush	4	70	19	7	
Gardner Saltbush					
Bud Sage					
Daubenmire Cover Class & Vegetation Height Data					
Summary of Vegetation Height	New Herbaceous Mean Ht: 8.6 "		Residual Herbaceous Mean Ht: 0 "		
Summary of Cover Class (%)	New Perennial Grasses: 17.0 %	New Annual Grass: 20.55%	Perennial Forb: 4.28 %	Residual Herbaceous: 0%	Other: 50 %
Browse Utilization					
ARTR			None		

4.0 Conclusions

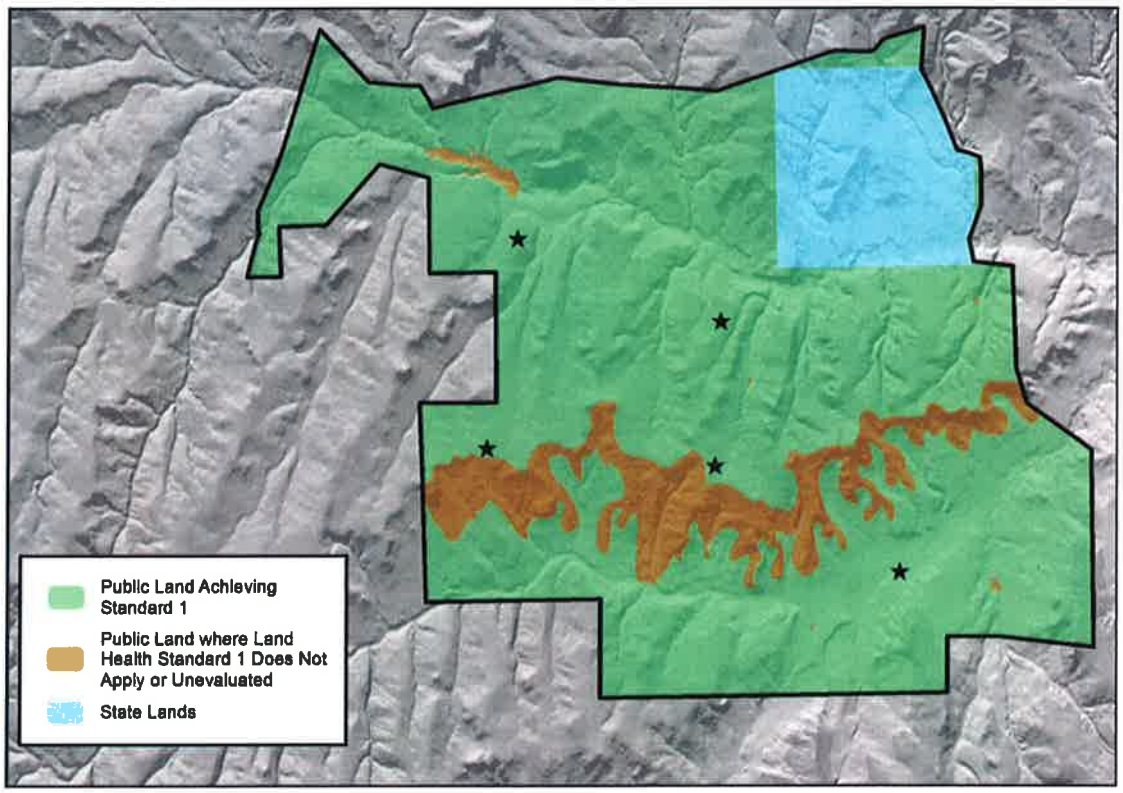
This section draws conclusions and makes determinations regarding:

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.

Land Health Reporting Categories	Acres
Public Land **Achieving** Standard 1	4,694.92
Public Land **Not Achieving** Standard 1	0
Public Land where Land Health Standard 1 **Does Not Apply** or Unevaluated	615.95
Total Public Land Acres	5,310.90



Rationale: The attribute ratings for *Soil and Site Stability and Hydrologic Function* were rated as *"None to Slight"* at both assessment locations. Throughout the allotment, the soils are stable. Erosion indicators (rills and water flow patterns) are minimal, only being present in association with areas of rock outcrops. Gullies have not developed in the allotment. The soil structure combined with a surface layers that are rich in organic matter and root masses protect the soil from rain drop impact and the erosive forces of overland

flow. The vegetative communities supported by the soils are capable of minimizing runoff and allow for maximum infiltration. There is no indication of historic soil loss. The category 'Public Land Where Land Health Standard Does Not Apply or Unevaluated' indicates areas that were delineated as rock outcrops where soil and vegetation cover was not quantifiable or nonexistent.

Acres where Land Health Standards DOES NOT APPLY or UNEVALUATED are areas where soil and vegetation cover was not quantifiable or nonexistent. Examples include: Slopes exceeding 60%, rock outcrops, Badland type soils, historic growth Juniper/Mountain Mahogany, or reservoir bottoms with or without water.

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 naturally occurring riparian areas or wetlands within the allotment that have been documented, verified, and monitored. While there are some vegetative components of a riparian type of area (cottonwoods) they are few, segmented, and limited by the nature of the watershed and in this case the ephemeral nature of the desert ecosystem.

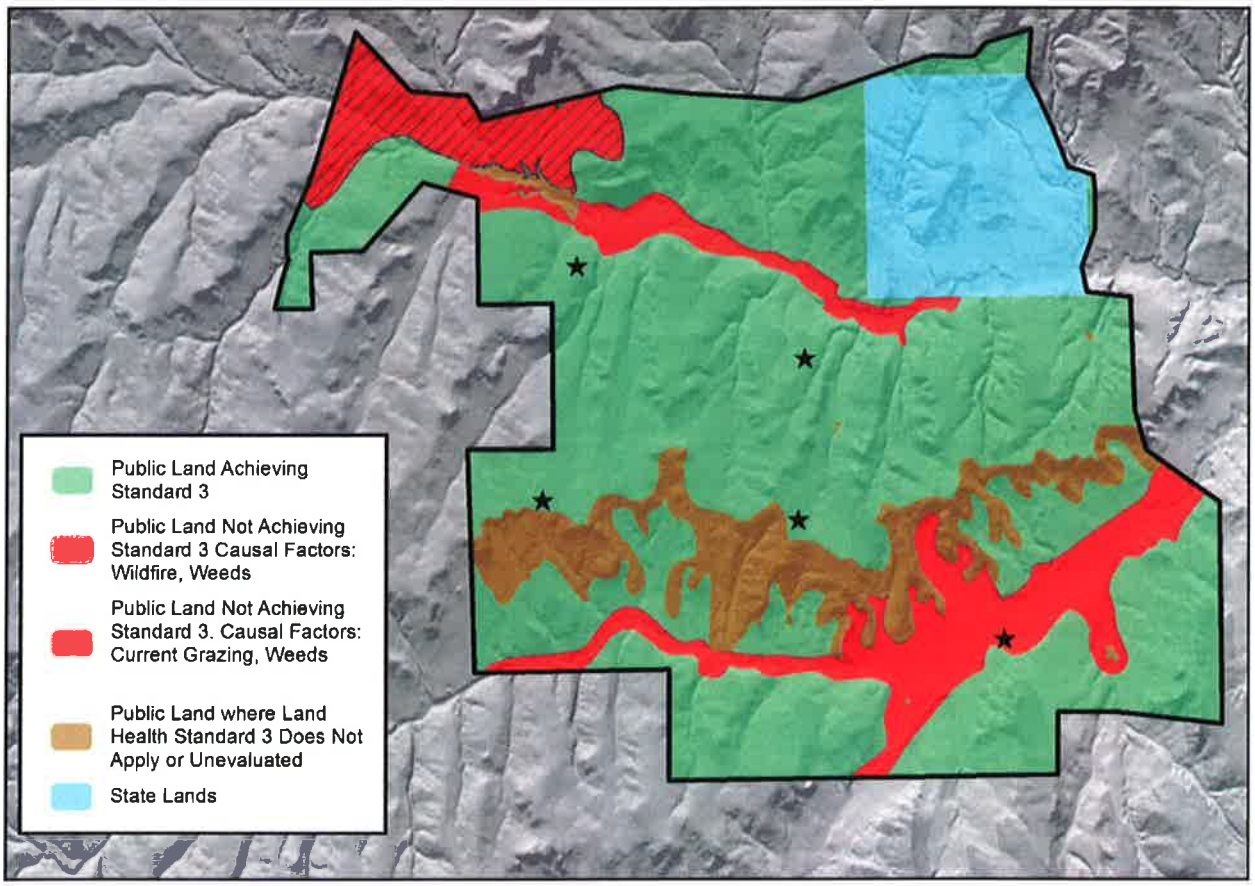
Land Health Reporting Categories	Acres
Public Land **Achieving** Standard 2	0
Public Land **Not Achieving** Standard 2	0
Public Land where Land Health Standard 2 **Does Not Apply** or Unevaluated	5,310.90
Total Public Land Acres	5,310.90

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.

Based on the assessment of the data collected as well as observations throughout the allotment, the following table summarizes the number of acres that were determined to meet Standard and Guidelines, the number of acres that were determined to not meet Standard and Guidelines, and the number of acres that no determination was made. This table is also visually represented by the map below.

Land Health Reporting Categories	Acres
Public Land **Achieving** Standard 3	3,732.24
Public Land **Not Achieving** Standard 3. Casual Factors: Fire and Invasive Plants	277.42
Public Land **Not Achieving** Standard 3. Casual Factors: Grazing, Invasive Plants	685.26
Public Land where Land Health Standard 3 **Does Not Apply** or Unevaluated	615.95
Total Public Land Acres	5,310.90



Rationale:
As it pertains to the acres that are MEETING the Standard, 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 disturbances. These sites have a vegetative community that is stable, intact, resistant to change and provides for soil and watershed stability.

Acres that are NOT MEETING the Standard, are areas affected by the causal factors of wildfire, historic grazing levels, dominance of invasive annual grasses/forbs, or current grazing practices.

The area not meeting this standard due to wildfire, historic grazing use, and dominance of the annual grasses/forbs invaders are the 300 acres burned in the 1996 wildfire. As a result of the three above mentioned factors, this area has lost the vegetative components which would allow a transition toward desired plant communities. The high percentages of annual grasses and forb invaders throughout this site create a management challenge that has not been successfully met at this time. Once this species has a niche on a landscape it is resistant and resilient to all changes. Success of restoration from this state is not known to have occurred, and is rated to be low and highly variable for the rate of control of most species. There may be native species that will persist in small scattered populations and under certain climatic conditions can show their resiliency and respond to the available resources, but generally found unable to out-compete the annual invaders.

The acres not meeting standards due to the combination of current and historic grazing management practices and the annual grasses/forbs invaders are mainly the ephemeral drainageways and bottoms of the allotment. Given that the allotment is repeatedly grazed every spring during the critical growing season; desirable cool season bunch grasses are not fully able to produce to their potential levels. Consequently the desirable herbaceous species become less frequent, less competitive, and more vulnerable to drought and

cheatgrass dominance. Even though the desirable herbaceous species present are well adapted to grazing, the species composition has been altered through long-term grazing during the plant's critical reproduction and growing season. The probability of transiting the current plant communities to a higher state is likely through long-term prescribed grazing, such as deferred season or rotational grazing.

Therefore, grazing use as described above in combination with the aggressive and opportunistic nature of cheatgrass is determined to be the causal factor for acres not meeting the standard.

Acres where Land Health Standards DOES NOT APPLY or UNEVALUATED are areas where soil and vegetation cover was not quantifiable or nonexistent. Examples include: Slopes exceeding 60%, rock outcrops, Badland type soils, historic growth Juniper/Mountain Mahogany sites, or reservoir bottoms with or without water.

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/NOT MET***

Buffalo Creek Allotment

Land Health Reporting Categories	Acres
Public Land **Achieving** Standard 4	3732
Public Land **Not Achieving** Standard 4	277
Public Land **Not Achieving** Standard 4 due to Disturbance or Invasive Plants	685
Public Land where Land Health Standard 4 **Does Not Apply** or unevaluated	616
Total Public Land Acres	5311

Rationale: The majority of the wildlife habitat within the allotment, where Perennial Grass/Big Sagebrush vegetation characteristics are intact, is capable of sustaining viable populations of animal species appropriate to undisturbed habitat. These areas, which consist of approximately 3,732 acres, can sustain all wildlife species that would be expected to be found there. Within this allotment are also approximately 1,578 acres that are not meeting vegetation standards due to current or historic conditions such as disturbance, invasive plants, or areas of badland interface, resulting in a localized diminished capability of sustaining wildlife populations appropriate to the overall site characteristics.

4.5 Standard 5

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

Rationale:

There is no information specific to this allotment or the management of this allotment available to indicate that that the standard is being or not being met. Buffalo Creek in this watershed is not described in the WYDEQ 2012 report.

The use classifications defined (WYDEQ, 2001) for the drainages in the allotment are considered to be Class 3B waters.

"Class 3B waters are tributary waters, including adjacent wetlands that are not known to support fish populations or drinking water supplies and where those uses are not attainable. Class 3B waters are

intermittent and ephemeral streams with sufficient hydrology to normally support and sustain communities of aquatic life, including invertebrates, amphibians, or other flora and fauna that inhabit waters of the State at some stage of their life cycles."

Anthropogenic uses and activities on the landscape can have significant impacts – both adverse and beneficial– on water quality and the health of a watershed. Human-related disturbances are numerous and include livestock grazing, land clearing, mining, timber harvesting, ground- water withdrawal, stream flow diversion, channelization, urbanization, agriculture, roads and road construction, off-road vehicle use, camping, hiking, and vegetation conversion. Biological stressors include habitat loss, alteration, effluent discharge, and degradation from decline in water quality, and changes in channel and flow characteristics (EPA, 2008 p.65).The allotment was reviewed for these types of impacts and none were identified as a causal factor for this standard.

There is no information currently available to indicate that this Standard is or is not being met. It can be concluded however that the soils and runoff conditions are appropriate for the allotment and lower amounts of sediment would be delivered from runoff in the allotment. Other management impacts that would have a potential to impair water quality such as excessive roads, mining, wildfire are not present in this allotment.

The reviews of casual factors that are currently available for this allotment indicate that this standard is being met. However, per BLM state office policy, compliance with Wyoming State Water Quality Standards is unknown because no official determination has been made by the Wyoming DEQ.

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 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.

4.7 Guidelines for Livestock Grazing Management: *NONCOMPLIANT*

Guidelines provide for, and guide the development and implementation of, reasonable, responsible, and cost-effective management practices at the grazing allotment and watershed level. These management practices will either maintain existing desirable conditions or move rangelands toward statewide standards within reasonable timeframes. Appropriate guidelines will ensure that the resultant management practices reflect the potential for the watershed, consider other uses and natural influences, and balance resource goals with social, cultural/historic, and economic opportunities to sustain viable local communities.

Rationale:
Areas that do not meet the above standards are also not in accordance with all of BLM Wyoming Guidelines for grazing management. The timing, duration, and levels of authorized grazing hinder the completion of plants' life-sustaining reproductive and/or nutrient cycling processes. Grazing schedules and stocking rates will need to be modified to ensure adequate periods of rest at the appropriate times. The rest periods will provide for seedling establishment or other necessary processes at levels sufficient to move the ecological site condition toward the resource objective and subsequent achievement of the standard.

5.0 Resource Specialist Signatures

X _____

Michael Peck
Rangeland Management Specialist

X _____ 5-12-15

John Elliott
Supervisory Rangeland Management Specialist

X _____

Ted Igleheart
Wildlife Biologist

X _____

Jessica Reinig
Rangeland Management Specialist

X _____

Jared Dalebout
Hydrologist

X _____ 5/12/15

Michael J. Phillips
Assistant Field Manager - Resources

6.0 DETERMINATION

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

X _____

Rebecca Good
Worland Field Office Manager

DATE: MAY 2 1 2015

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