

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

Coal Draw Allotment
#00574

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

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

FY 2014/15



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 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 Coal Draw No. 00574. 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 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

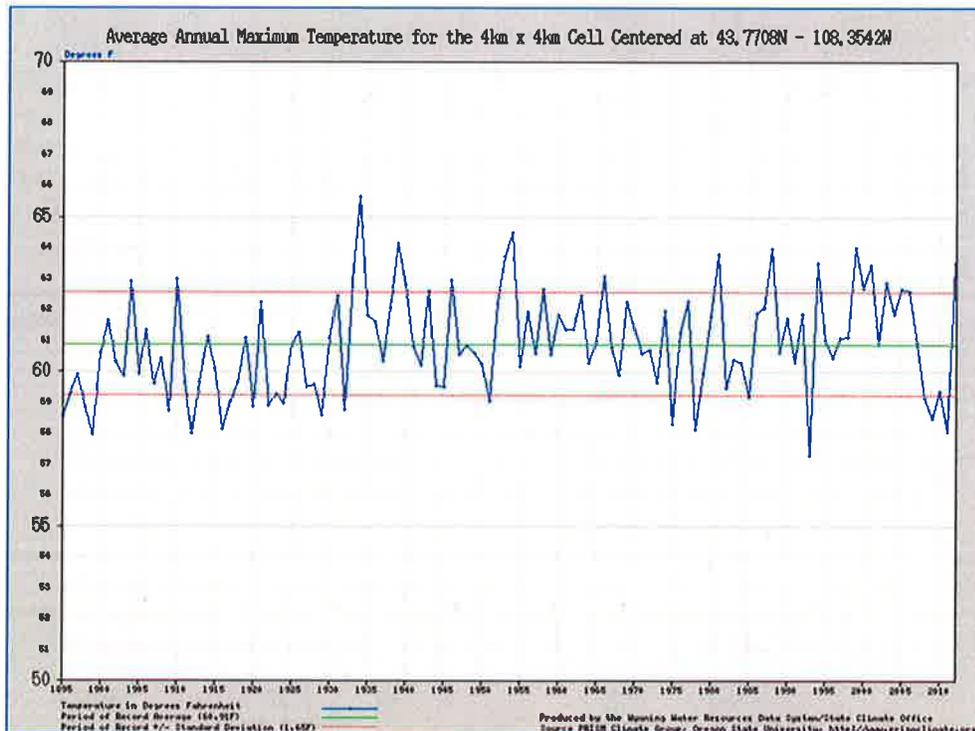
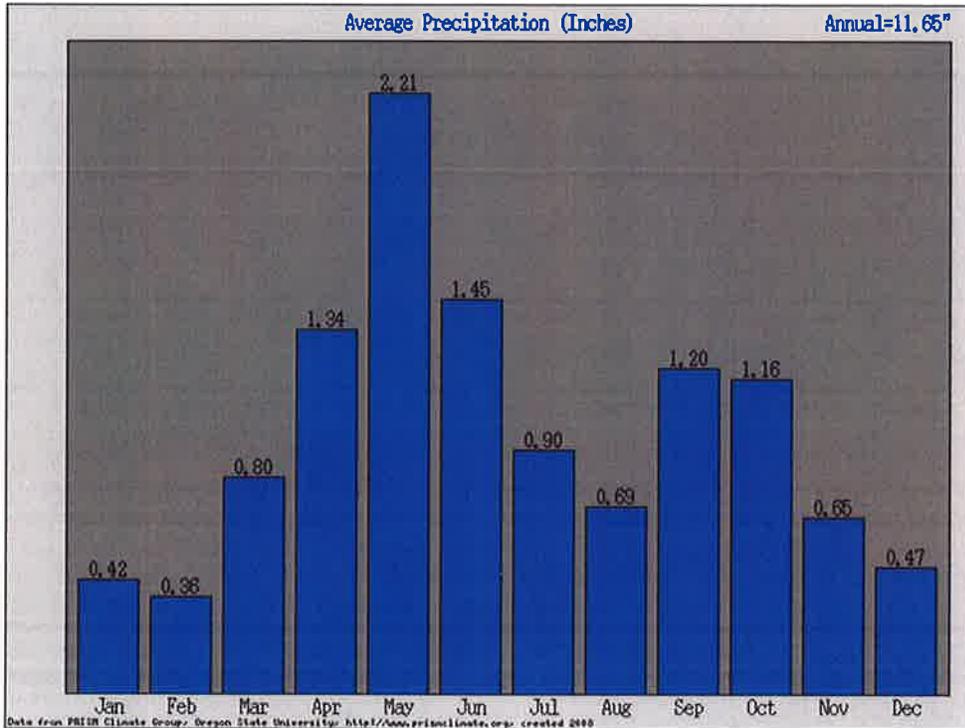
Coal Draw Allotment is located in the western reaches of Hot Springs county-northwest of Thermopolis, Wyoming. The average elevation ranges from approximately 5300 feet to 4400 feet above sea level. The allotment encompasses approximately 7729 total acres including 6551 public acres and 1178 State/private land acres (Grass Creek RMP). The allotment is classified in the “M” (Maintain) category.

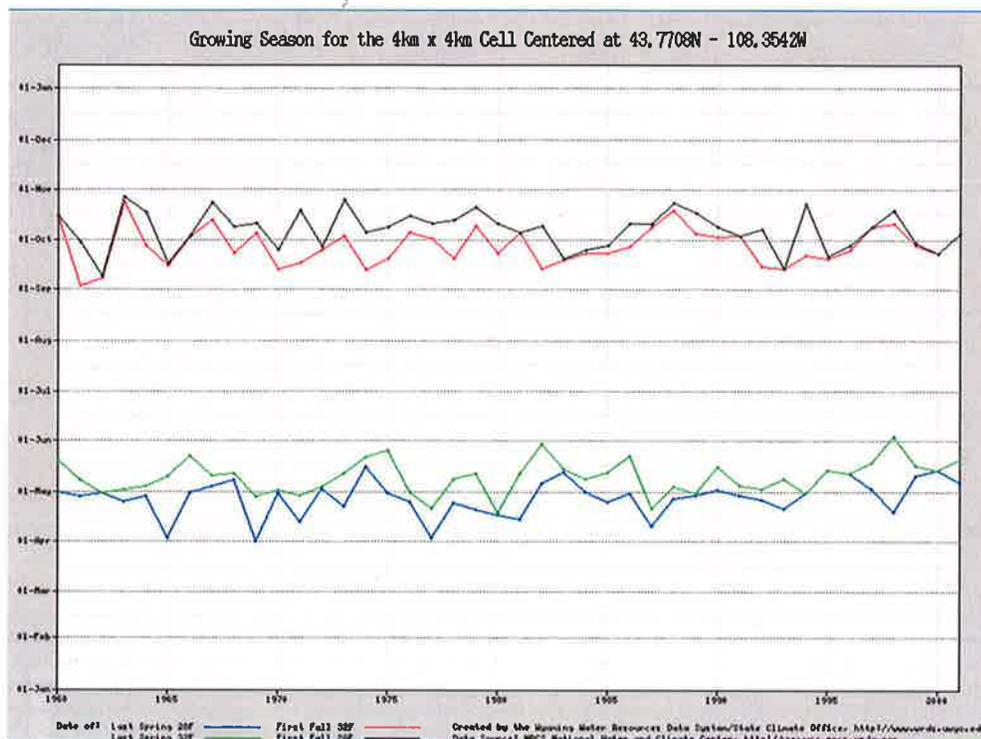
2.2 Climatic Features

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 (PRISM,2012) (Parameter-elevation Regressions on Independent Slopes Model), overall averages from 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 the mean elevation for the allotment. In total, 40 percent of the annual precipitation is during the months of April-June. Additionally the 30 year frost free period for 28 and 32 degree days for the watershed is displayed below along with the 30 year average maximum temperature. The modeled amount is slightly lower than the NRCS data presented above from the Thermopolis station.





The maximum and minimum elevations for each allotment within the watershed were calculated along with the average slope given in percent rise for each 10 meter digital elevation grid. The Coal Draw allotment is at the top of lower centrally located sub-watersheds of the Bighorn River and has the highest elevation of 5291 feet above sea level.

Allotment	Max Elev (ft)	Min Elev (ft)	Average Elev (ft)	Average Slope (% Rise) 10m
Coal Draw	5291	4427	4761	14

2.3 Soils

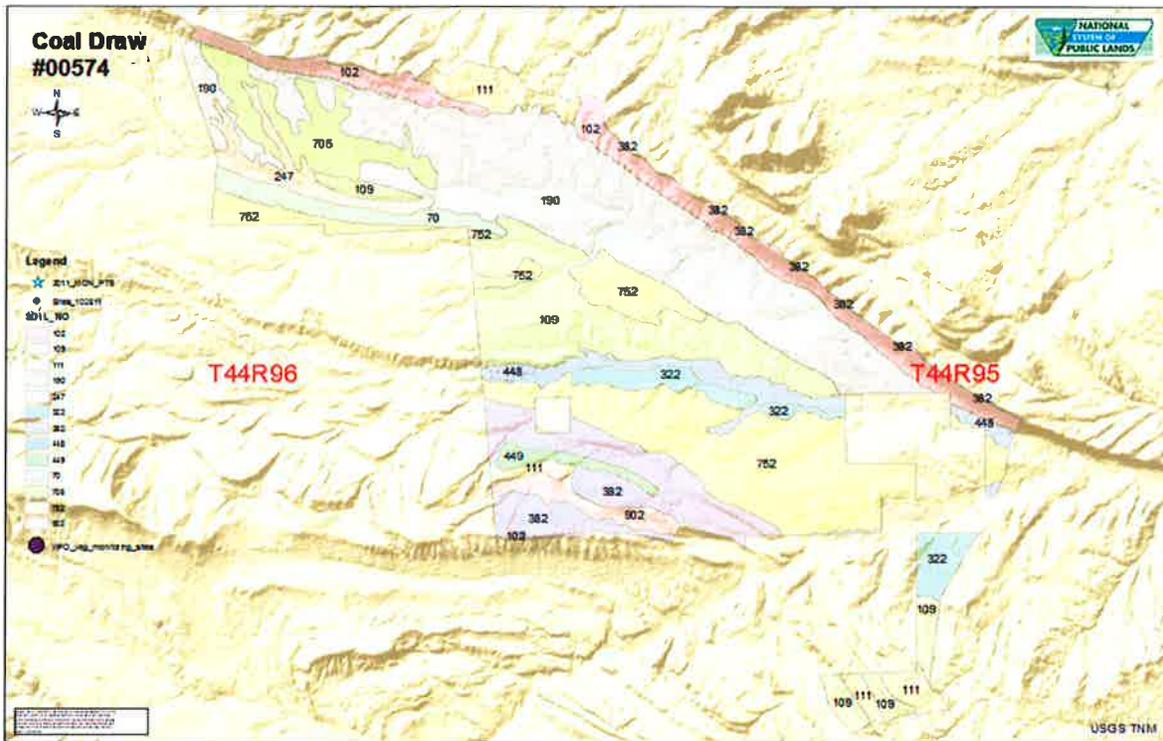
The soils reflect the desert environment in which they formed. They are highly variable, reflecting differences in parent material (shale, sandstone and/or mixed alluvium), position on the landscape, slope and aspect. Soil depth ranges from 10 inches to over 60 inches with sandstone and soft shale bedrock 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 average slope for the allotment as calculated above is 14 percent.

The Coal Draw Allotment is situated within the 10-14 inch Big Horn Basin (BH) Precip Zone as depicted by NRSC spatial data. Based on the soil survey data for Hot Springs County, the dominant soil units and amount of acres for the allotment is listed below:

Coal Draw Public Land Soils (May 2014)

SOIL_NO	Map_Unit_Name	Surface Texture	Slope	Ecological Site	Precip Zone	Acres
70	CADOMA SILTY CLAY LOAM	sicl	1-15	SU	10-14	158.95
102	ROCK OUTCROP	ro	0-100	RO	5-19	486.95
109	EPSIE(45%)-ROCK OUTCROP(40%) COMPLEX	sic,ro	3-60	SU,RO	10-14	933.97
111	ROCK OUTCROP(30%)-SHINGLE(25%)-TASSLE(25%) COMPLEX	ro,l,sl	3-60	RO,SwLy,SwLy	10-14	273.35
190	EPSIE(45%)-SHINGLE(30%)-COMPLEX	sicl,l	6-45	SU,SwLy	10-14	1744
247	TORRIORTHENTS SEVERELY ERODED	all	0-15	none	5-19	163.57
322	NIHILL(45%)-SHINGLE(30%) GRAVELLY LOAMS	grl,grl	3-45	Gr,SwLy	10-14	225.43
382	ROCK OUTCROP(40%)-TASSEL(40%) COMPLEX	ro,l	3-60	RO,SwSy	10-14	560.94
448	TORRIFLUVENTS SALINE	none	0-6	NONE	5-19	236.84
449	TRAVESSILLA(45%)-ROCK OUTCROP(40%) COMPLEX	l,ro	3-60	VS,RO	10-14	65.93
705	KIM(50%)-THEDALUND(30%) LOAMS	l,l	3-15	Ly(Cy),Ly	10-14	333.38
752	EPSIE SILTY CLAY LAOM	sicl	3-15	SU	10-14	1253.85
902	SAMSIL(50%)-SHINGLE(20%)-ROCK OUTCROP(15%) COMPLEX	c,l,ro	3-45	SwCy,SwLy,RO	10-14	114.83
					Total	6551.99

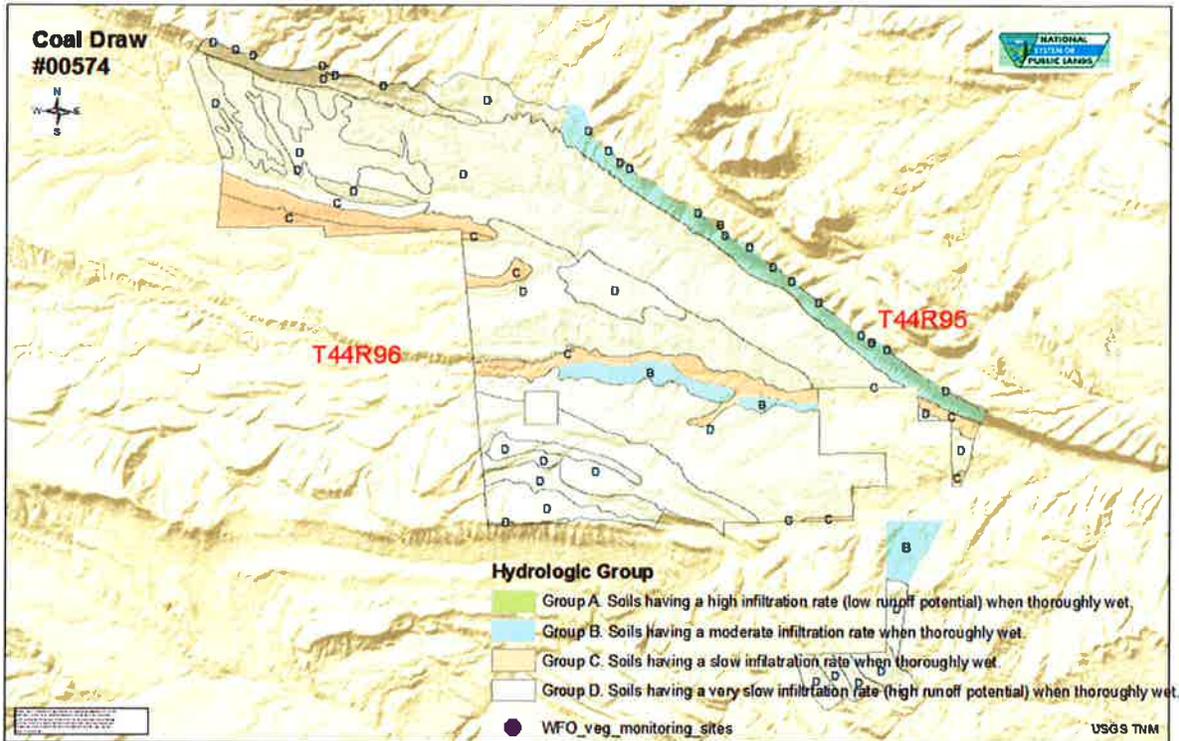
sicl=silty clay, ro= rock outcrop, l= loamy, grl=gravel, c=clay



Two 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 Coal Draw Allotment. The

assessments were conducted at two monitoring sites selected for this analysis. The table in vegetation monitoring (section 3.1) displays the soil characteristics for each assessment site.

The Soil Hydrologic Group map below displays the distribution of the dominant soil hydrologic group that is assigned to the watershed. Group D type soils are those where the dominant soil type in the soil map unit contains very low infiltration rates, locally in the watershed these areas are located around rock outcrops and other shale type soils where infiltration rates are low or very low. The group C soils are from loamy range ecological sites in the watershed. The Coal Draw allotment is dominantly group D soils with some group C and B soils along drainages and at the base of slopes.

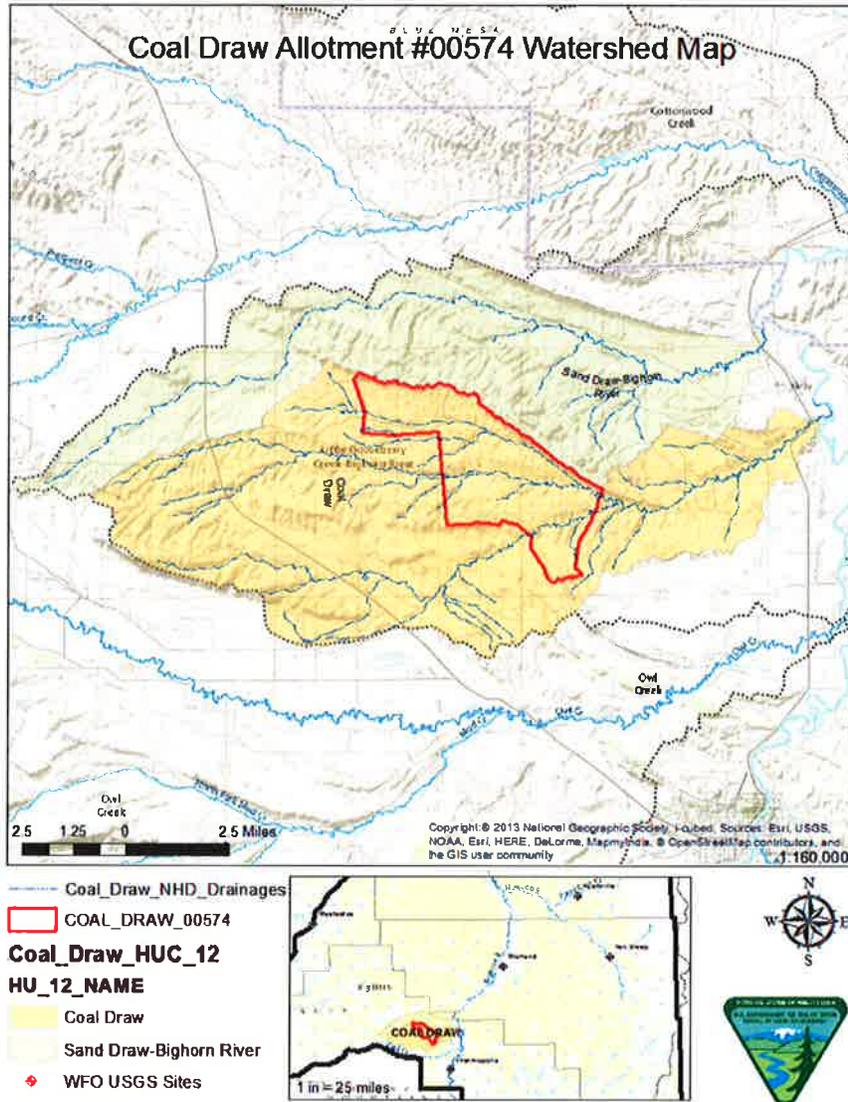


2.4 Hydrology

2.4.1 Surface Water/Watershed

The Coal Draw allotment falls mainly within the Coal Draw-Bighorn River sub-watershed with a very minor portion in the Sand Draw watershed to the north. The amount of acres from the allotment as related to the 6th level sub-watershed as defined by the United States Geologic Survey (USGS) is found in the table below. Sand Draw originates west of the Bighorn River and flows in an eastern direction through the allotment to confluence with the North and South Forks of Coal Draw to the east of the allotment. Other significant sized drainages in the allotment are Wagon Gulch and the North Fork and South Fork of Coal Draw.

Watersheds			
Watershed (HUC) Level #6	Acres (mi ²)	Acres (mi ²) Within Allotment	% of Acres of Watershed in the Allotment
Coal Draw-Bighorn River (100800070402)	44189(69)	7760(12.1)	17.6%
Sand Draw-Bighorn River	29039 (45.3)	26 (0.001)	0.001%



There are several miles of ephemeral/intermittent channels in the allotment. 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 arid environment of the allotment in addition to infrequent storm events.

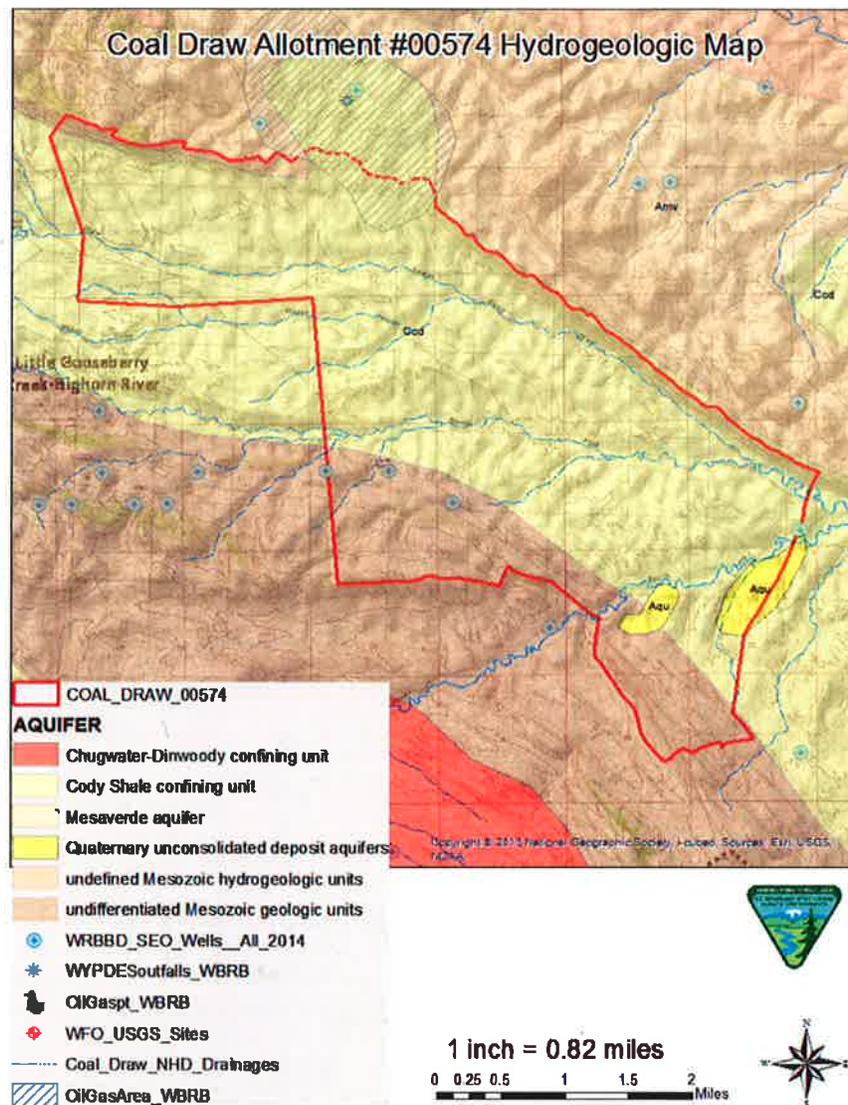
Rosgen Types- The channels within the watershed are dominantly Rosgen G5 type streams that are defined as (Rosgen, 1996) entrenched, narrow, and deep channels with a low to moderate sinuosity. These types have high bank erosion rates and a high sediment supply. Rosgen F5 type channels, which are also present, are described as

entrenched, meandering channels which are deeply incised in valleys of relatively low relief such as the Coal Draw sub-watershed. They contain highly weathered rock and erodible materials, and high lateral extension rates and bar deposition following infrequent storm events.

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 sedimentary bedrock over which it was formed. The drainage density or amount of drainages per square mile is high, and very high along badland on steep rock outcrops of the allotment

2.4.2 Groundwater

The area is located in a highly erosive area with high amounts of runoff and very low permeability due to very fine grained geologic outcrops of primarily of the Cretaceous Cody Shale Formation. Other portions of the allotment are other undefined Mesozoic units of sandstone and mudstone. According to Wyoming State Engineers records of 2014 there are wells in the allotment, see map below.



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. In this allotment there has been historic ground water recharge from the disposal of produced ground water associated with oil fields that are located above the allotment. The produced water historically recharged aquifers along the drainages of Sand Draw and Coal Draw. In 1994 the average amount of barrels of produced water for the Little Sand Draw oil field was 12 million to 7 million barrels in 2014. Recently due to re-injection practices in the oil field the amount of discharged water has declined in the area and available shallow groundwater that was once available for vegetation has been reduced .

2.4.3 Water Quality (Surface)

The main drainages of Sand Draw and North and South Fork of Coal Draw in the allotment 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. The beneficial uses are limited due to the intermittent/ephemeral flow regime of the main drainages.

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

Historically Sand Draw, RAIDS Segment T0001X, received sufficient produced water and was capable of supporting riparian vegetation around the perimeter of the small active channel. However following field investigation of the segment in 2014, there was no evidence of obligate or facultative wet type plant species in the floodplain areas. This is due to the reduction of oil field produced water in the watershed.

The other riparian area on public land is a small isolated seep area named Harris Spring. This is adjacent to private land and is located in T 44North Range 96 West Section 23. This spring was developed for livestock use. The water is piped to a tank with overflow into a reservoir. The naturally occurring riparian characteristics surrounding the area have been altered as a result of the water diversion from the spring source.

2.5 Upland Vegetation

The native plant species identified included needle and thread grass, Sandberg bluegrass, blue grama grass, textile onion, sego lily, plains prickly pear cactus, aster spp., Wyoming big sagebrush, biological crusts, lichens, alkali sacaton, bluebunch wheatgrass, phlox spp., western wheatgrass, woody Aster, bottlebrush squirreltail, scarlet globemallow, Carex spp., vetches, prairie Junegrass, rabbitbrush, black sagebrush, rosy pussytoes, greasewood, juniper spp., winterfat, sixweeks fescue, broom snakeweed, prairie sagewort, wildrye, and Gardner's saltbush. This list identifies the species within transects or noted within areas of the transects but does not ensure a complete list of every plant within the allotment.

2.6 Invasive Species

Weed species noted within the allotment include saltcedar and cheatgrass.

2.7 Livestock Grazing Management

Currently there is no active grazing permit to authorize grazing on public lands of the allotment. The most recent grazing permit expired in 2005. The last permitted use on the public lands of the allotment was in 1999. The last permit read as follows:

Coal Draw No. 574	Livestock Number/kind	Grazing Begin	Grazing End	%PL	AUMS
	360 C	11/1	2/6	80	928
Active AUMS 924		Suspended AUMS 6		Preference 930	

Livestock Grazing Use 1978 to 1999	
Year	AUMs utilized (1991 & 1994 are undetermined)
1978	673
1979	922
1980	922
1981	922
1982	922
1983	672
1984	288
1985	510
1986	480
1987	576
1988	536
1989	271
1990	408
1992	852
1993	598
1995	280
1996	119
1997	509
1998	766
1999	982
Average	610

Data from the Dead Files Owl Creek Land Co. and Pennoyer and Son.

2.8 Wildlife

The Coal Draw allotment provides habitat for numerous wildlife species, some seasonally and some yearlong. Saline uplands dominate this allotment with some scattered sagebrush along the north and southern boundaries. A small portion of the southwestern corner of the allotment, characterized by shallow soil ridges with scattered limber pine and juniper, is mapped as crucial winter range for mule deer. However smaller numbers of mule deer and antelope

can be expected throughout the allotment year around. There are also numerous other small mammals, predators, passerines, and raptors that use this allotment, some seasonally and some yearlong.

2.9 Threatened, Endangered, Candidate, or Sensitive Species

Sage grouse leks have not been identified in this allotment, and the closest active leks are approximately 6 miles south and 8 miles north of the allotment boundary. Habitats in this allotment do not appear to be suitable for sage-grouse wintering, breeding, nesting or brood rearing, and for this reason no sage-grouse habitat assessments were done. Some of the sagebrush communities providing big game winter range mentioned above, although sparse, could be providing nesting and foraging habitat for other sagebrush obligate passerines like the sage thrasher and sage and Brewer’s sparrow. No known threatened or endangered animal species are known to inhabit the allotment, but the sage thrasher and sage and Brewer’s sparrow are all Wyoming BLM sensitive species.

3.0 Summary of Monitoring Data / Assessments

3.1 Monitoring Data

In the summer of 2014, the allotment was toured extensively and 2 vegetation monitoring sites were selected in the allotment as part of the Rangeland Health Assessment process. These two sites represented the majority of the allotment by vegetative component. While not every acre can document these 2 sites well represent the whole. Complimenting those locations were additional photo-points. 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.

Line intercept cover transects were completed in each monitoring site. A summary of the cover data collected from each monitoring site is shown below:

Vegetation Monitoring Data					
Monitoring Site	Ecological Site	Basal Veg. Cover	Litter	Bare Ground	BRTE presence ((hits/transect pts)*100)
Shallow Loamy cover	SwLy 10-14		29.1	33.7	0
Saline Upland Cover	SU 10-14		23.1	52.8	0

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

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 Sheet for the Shallow Loamy 10-14 and a Saline Upland 10-14 inch precipitation zone. This was done to determine departures from normal-as prescribed in the reference sheet. Individual ratings to the Rangeland Health Indicators are displayed for each monitoring site below.

Rangeland Health Indicators		
Indicator	Departure from Reference Sheet	
	Shallow Loamy	Saline Upland
1. Rills	NS	M
2. Water-flow patterns	SM	M
3. Pedestals and/or terracettes	SM	M
4. Bare ground	NS	ME
5. Gullies	M	ME
6. Wind-scoured, blowouts, and/or deposition areas	NS	NS
7. Litter movement	SM	M
8. Soil surface resistance to erosion	NS	ME
9. Soil surface loss or degradation	SM	M
10. Plant community composition and distribution relative to infiltration	SM	M
11. Compaction layer	NS	NS
12. Functional / structural groups	SM	SM
13. Plant mortality / decadence	NS	SM
14. Litter amount	NS	SM
15. Annual production	NS	NS
16. Invasive plants	M	ME
17. Reproductive capability of perennial plants	NS	NS
Indicator Summary		
Soil / Site Stability (<i>Indicators 1-9, 11</i>)	SM	M
Hydrologic Function (<i>Indicators 1-5, 8-11, 14</i>)	SM	ME
Biotic Integrity (<i>Indicators 8-9, 11-17</i>)	SM	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 and Hydrologic Function using rangeland health indicators 1 through 11 and 14.

3.3 Hydrology

3.3.1 Surface Water

The amount of surface water and runoff data in the watershed is limited when compared to main adjacent creeks such as Owl Creek to the south and Cottonwood Creek to the north, which are also tributaries to the Bighorn River. The Coal Draw drainage does not have headwaters located further to the west as higher watershed elevations as do these other watersheds. Therefore runoff patterns, elevation, and flow regime is most similar in nature to the Kirby

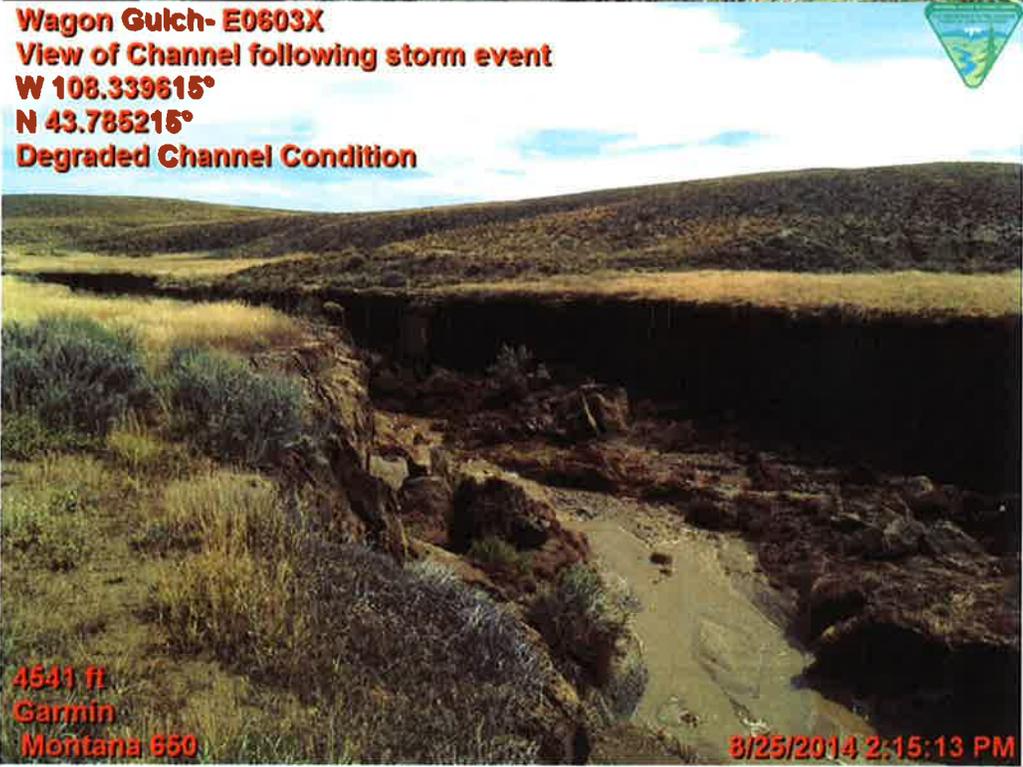
Creek that is located to the east and not similar to Owl and Cottonwood Creeks. Although the flow regime is ephemeral, the amount and intensity of runoff following storm events is an important indicator of upland health conditions in the allotment and within the watershed. The hydrologic and soil rangeland health indicators as outlined in the table above were assessed to determine current conditions. The overall ratings are found in the table above. Generally in areas where a moderate or greater departure was referenced for soil or hydrologic function, these areas are not currently meeting standards. The cause factors are determined below.

Human Influence

Anthropogenic uses and activities on the landscape can have significant impacts – both adverse and beneficial– on water quality and the health of a watershed. There are several human-related disturbances that are considered when analyzing the water quality of a watershed. The factors to be considered as stressors on water quality 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 main uses with potential to impact water quality in this allotment are from grazing and roads. The other factors mentioned above were not present in the allotment.

Many of the first order tributaries in the basin can be classified as G-Type channels, or gullies. These channels are highly erosive, generate high sediment volumes, and can result in the loss of productive lands and destabilize upland conditions. Observation of many of these channels indicates that while the major stream channels appear to have achieved a level of stability, the upper reaches of the watershed are still suffering a level of destabilization. These channels could be forming in response to one or more of numerous stimuli including but not necessarily limited to: channel realignment (straightening), road and culvert construction, rangeland management practices, or base-level lowering associated with main channel incision (Anderson,2009 p.3.100). The following monitoring photos depict the erosional process occurring in the allotment.





The nearest population center is Thermopolis, Wyoming that is located 15 miles to the southeast of the allotment. There is grazing that occurs throughout the watershed but not currently in this allotment. The season of use, amount

of use, and type of grazing use is discussed in greater detail in section 2.7 of this document. Human activity has created demand for existing roads in the watershed primarily for oil and gas resources, recreation use and grazing management.

3.3.2 Ground Water

The estimated depth to groundwater is estimated to be greater than 100 feet in upland areas. The amount of evaporation s indicated in the Wyoming Climate Atlas is 26 inches per year for the Thermopolis area. This exceeds the annual precipitation of 10-12 inches per year, and therefore the amount of groundwater recharge into the primary Mesaverde Aquifer is minimal. The Cody Shale formation is considered an confining unit and not a primary aquifer. The only other potential recharge is along stream channels through infiltration following storm events.

3.3.3. Water Quality (Surface)

BLM Observations-

One of the main tributaries that is located in the center of the allotment is Wagon Gulch. Below are photos of active head-cuts that appear to be migrating upstream. This erosional process will continue to alter the geometry of these effected channels.

These areas are where new sediment is delivered into the drainage system. The watershed transmits large amounts of in-channel sediment into the system during primary snowmelt and other storm events that are large enough to trigger overland flow.

Wyoming DEQ:

The drainages are classified by the WYDEQ as class 3B streams by default. Coal Draw is not on the WYDEQ 2012 305b as impaired. The contribution of water quality from upstream BLM sources is limited to storm water runoff events from ephemeral channels.

3.3.4 Riparian

The only naturally occurring riparian area or wetlands within the allotment on public land is Harris Spring. This spring was developed historically in the 1970's and available water is diverted to stock water tanks below the spring. The area has been altered historically and the riparian area reduced as a result. The latest recorded maintenance of the project was in 1980.



View of Reservoir below Harris Spring



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, 9, and 11 through 17.

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 shallow Loamy 10-14 inch precipitation zone and the Saline upland 10-14 inch precipitation zone ESD's.

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.

Shallow loamy

The data collected at this site indicates that this site has characteristics of a Perennial Grass/Mixed Shrub Plant Community. The attribute rating justification for the Biotic Integrity at this assessment was "Slight to Moderate". The functional/structural groups are slightly reduced/alterd and the plant diversity is still adequate and diverse. The dominant cool season grass expected for this site is present and is made up primarily of bluebunch wheatgrass. Perennial forbs were noted in the assessment area as a minor component which is expected. The two main woody species on site is Gardener's saltbush-expected amongst the complex of saline uplands. Blue grama is also present on site (expected for the community) in small areas. Biological crusts were common in the area and readily observed on the transect. Plant mortality/decadence was considered none to slight. The percent litter was within expected at the transect site as was the amount of bare ground. The invasive plants indicator number 16 was rated as moderate. While no cheatgrass was documented within the transect it was noted as being in the area in small locations/pockets within the ecological site.



The picture depicts the ridges within the allotment that are of bluebunch wheatgrass composition-typically observed in the northern end of the allotment. Location: T44 R96 Section 13 looking northwest.

Additional Observation Photos



The picture represents many of the draws that are now dominated by *Bromus* species. These drainages show active soil movement and headcutting. Location: T44 R95 Section 18 looking northwest.



The picture depicts going from the shallow loamy range sites with a species composition of bluebunch wheatgrass to flat in section 10 with a dominant composition of *Bromus* species.



Also in Section 10, the picture depicts the drainage bottom above those depicted in the picture above (section 18). The ephemeral is grassed in and is not actively moving soils.



This picture depicts the southwest corner of the allotment. The area is broken by sandstone rocks with cheatgrass common throughout. Location: T44 R96 Section 23 looking north.

4.0 Conclusions

This section draws conclusions and makes determinations regarding:

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

4.1 Standard 1

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

Rationale:

Met

The loamy and shallow loamy range sites rated as a slight to moderate departure from reference conditions according to the ecological site description for these acres. These acres have appropriate amounts of vegetation, litter, and soil stability to allow for water infiltration to provide for optimal plant growth for these sites.

Not Met

As mentioned in the rationale for standard 3, the saline upland areas are currently not allowing for water infiltration to provide for optimal plant growth and minimal surface runoff. This is supported by elevated amounts of bare ground and reduced amounts of cover by vegetation as determined by the rangeland health indicator monitoring sites and channel conditions below head-cuts where alteration has occurred. This is also supported by the active head cuts in the channels that are advancing upstream and altering the channel geometry due to excessive runoff from upland areas.

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 Met

Rationale:

There is one spring that is on public land that is named Harris Spring. This area historically supported a small isolated wetland seep type riparian area. The area receives use as a result and is not currently fenced. The approximate area encompasses one acre.

Casual Factor -Water Development Associated with Historic Livestock Grazing-see 3.3.4 for description.

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-MET: As it pertains to the acres that did meet 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. The sites have a vegetative community that is stable, intact, resistant to change, and provides for soil and watershed stability.

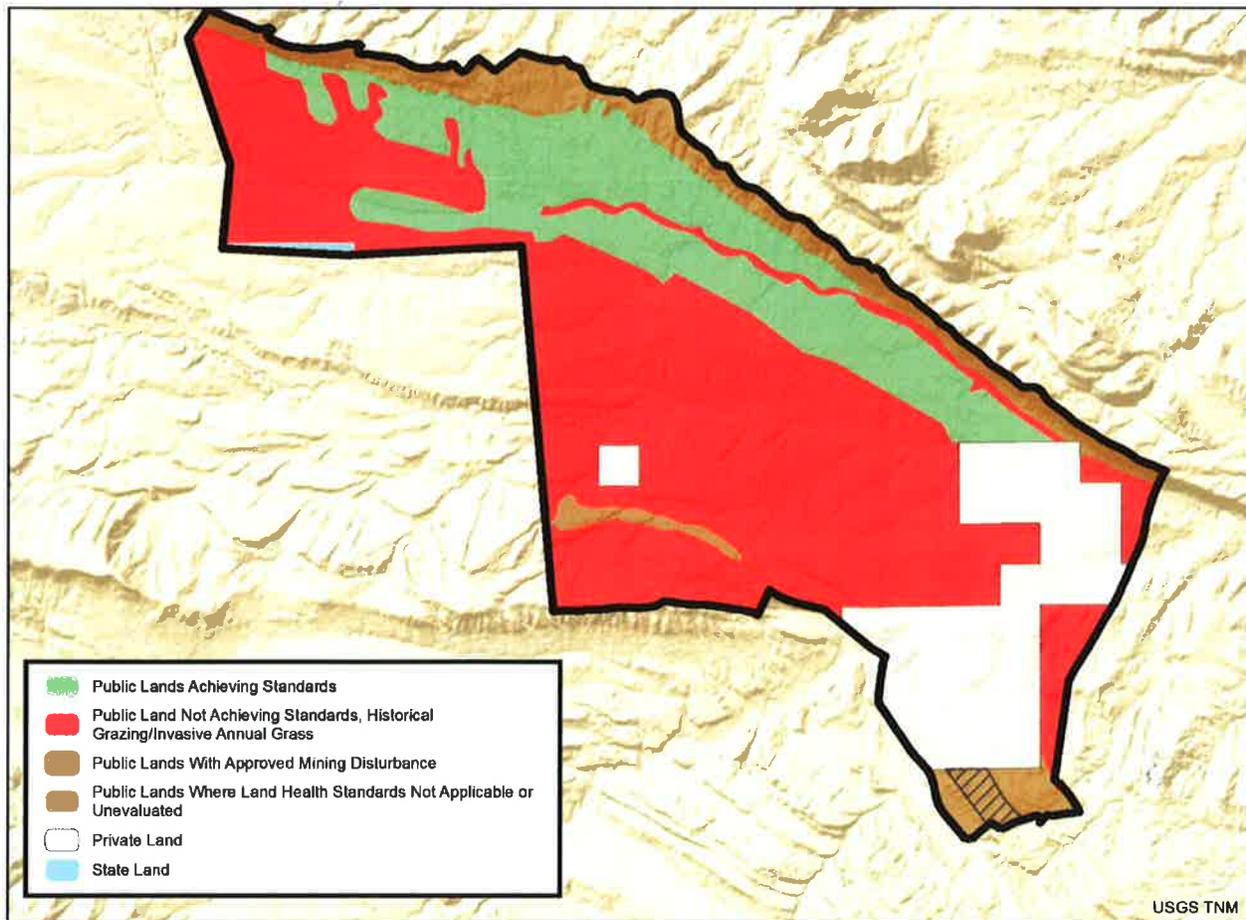
These acres are generally in the northern portion of the allotment. They occur on the shallow loamy ridges of the allotment.

RATIONALE-NOT MET: Acres that were determined to have not met the standard are those that have had a significant change or shift from the potential of the site and do not have an appropriate plant community capable of recovering or returning to a functional community without mechanical treatments, seedings, intensive grazing management, etc. These sites have little capability or probability of returning to a more desirable state.

These acres are generally in the southern and western edges of the allotment on primarily saline upland or saline upland influenced range sites. In some of these areas it is because of a loss of desirable species while in other areas it is because of a loss of desirables in addition to the invasion of undesirables such as cheatgrass. Overall the standard is not met on these acres due to the invasion of cheatgrass and the loss of or reduction of functional structural plant groups.

A review of the history of the allotment indicates that there was a total of 1,142 AUMs (private and public) with the public making up 1,033 of those AUMS within the allotment (Adjudication file Coal Draw Allotment, 1965). There were 924 AUMs determined to be for use by livestock and 109 were allowed for wildlife. This accounted for all AUMs to either be used by livestock or wildlife. This determination of AUMs was based upon 6945 federal acres however since then the boundary has changed and there are currently 6551 acres within the allotment. The areas removed from the allotment are those within T44N R96W Sections 1 and 12. These are areas that are separated from the allotment by a natural barrier /divide of rock outcrop that are not accessible for use by the Coal Draw Allotment.

Land Health Reporting Categories	Acres
Public Land Achieving Standard 3	1563
Public Land Not Achieving Standard 3	4126
Public Land where Land Health Standard 3 Does Not Apply or unevaluated	862
Total Public Land Acres	6551



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 (see rationale)**

Land Health Reporting Categories	Acres
Public Land Achieving Standard 4	1563
Public Land Not Achieving Standard 4	4126
Public Land where Land Health Standard 4 Does Not Apply or unevaluated	862
Total Public Land Acres	6551

RATIONALE:

Two monitoring locations were chosen in this allotment for monitoring and evaluation of soil and vegetative parameters and for evaluating the 17 Indicators of Rangeland Health. One of these sites was in a shallow loamy site and the other in a saline upland. The locations of these monitoring sites were chosen to provide an overall representation of the vegetation in the allotment. No sage-grouse habitat assessments were done in this allotment because there was not the quantity or quality of sage-grouse habitat present.

MET:

As was mentioned above in the rationale for Standard 3, data collected at the Shallow Loamy Cover site indicated this site is best described as a Perennial Grass/Mixed Shrub Plant Community. The functional/structural groups are slightly reduced/altered and the plant diversity is still adequate and diverse. This community still retains appropriate pathways available to respond to favorable environmental conditions, and environmental disturbances. These communities are stable, intact, resistant to change, and provides for soil and watershed stability. The Biotic Attribute of Rangeland Health for this site had a "Slight-Moderate" rating, and these sites maintain enough diversity and dominance by desirable perennial grasses to return to their HCPC. This community provides for a diversity of plant species, including an overstory of sagebrush and understory of bunchgrasses and forbs, and in turn provide for the diversity of wildlife habitat needs like cover, forage and nesting habitats. Most importantly these vegetation communities provide a diversity of native plant species that in turn provide for a diversity of animal species, of which all are appropriate to the habitat, and therefore do meet Standard 4.

NOT MET:

Data collected at the Saline Upland Cover monitoring site indicates that this site is best described as Gardner's saltbush/bare ground community. These communities are characterized as being sites where invasive species, including Blue Grama and Prickly Pear, have either taken over the site, and/or sites where the desirable perennial grasses have been lost from the plant community. Also the Biotic Attribute of Rangeland Health was rated Moderate for this site, meaning that this site has at least moderately departed from what the potential Historic Climax Plant Community (HCPC) is for the site. This plant community exhibits a low level of plant diversity and therefore does not provide for a diversity of wildlife habitat needs in the form of cover, forage, or nesting habitat. And most importantly this vegetation community consists of invasive species that are not appropriate for their habitats, and compete with native plant species for space and resources and in turn do not provide for diversity of animal species and for these reasons do not meet Standard 4.

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. There are no major drainages of significant size to be listed 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."

Many studies have documented the effects of heavy grazing on riparian vegetation and soil erosion rates, but few studies have directly assessed impacts on water quality. Potential management impacts to water quality from rangelands as outlined in (Binkley, 1993) such as: excessive livestock waste production, resource extraction, stream channel modification, bank erosion from floods, erosion following wildfires, or erosion from overgrazing are elements to consider as possible non-point source impacts to water quality. The allotment was reviewed for these types of impacts and none were identified as a causal factor for this standard.

Therefore as per BLM state office policy, compliance with Wyoming State Water Quality Standards is unknown.

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

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. COMPLIANT/NOT COMPLIANT

Rationale, Standard 2: Past permitted use allowed for grazing the spring area and because it is a naturally producing water source with vegetation that is typically succulent, the use is likely to re-occur in the future. Fencing of the spring would provide an opportunity for the area to make progress towards meeting the standard.

Rationale, Standard 3:

To state that current management is the possible cause of acres not meeting a standard or not in compliance with the Guidelines cannot be made as there is no active grazing permit and has not been for approximately a decade.

However, a review of the history of the allotment indicates that there was a total of 1,142 AUMs (private and public) with the public making up 1,033 of those AUMS within the allotment (Adjudication file Coal Draw Allotment, 1965). There were 924 AUMs determined to be for use by livestock and 109 were allowed for wildlife. This accounted for all AUMs to either be used by livestock or wildlife. This determination of AUMs was based upon 6945 federal acres however since then the boundary has changed and there are currently 6551 acres within the allotment. The areas removed from the allotment are those within T44N R96W Sections 1 and 12. These are areas that are separated from the allotment by a natural barrier/divide of rock outcrop that are not accessible for use by the Coal Draw Allotment. While the area was removed from the allotment boundary the AUMs were not removed from the grazing permit.

The previous stocking rate was 7 acres/AUM – 6551 acres/930 AUMs. The long term average use has been 610 AUMs which equates to a stocking rate of 10.8 A/AUM. The stocking rates prescribed by the ESD's (SwLy and SU 10-14") recommend stocking rates of approximately 6-20A/AUM which averages to a 13A/AUM. While this is not a stocking rate analysis it could indicate that the allotment has not been stocked correctly over the years and therefore a decline in rangeland health conditions occurred as a result of the established stocking rate.

Grazing management consists of timing of use, animal kind of use and amount of use to be made (AUMs). In this case, the timing has been during non-growing season-the winter, when it is least likely to interfere with a plant's ability to grow and reproduce. The kind of use has been cattle and according to the NRCS the vegetation located on this allotment is utilized by cattle. The last component is the amount of grazing-the amount of AUM's permitted. While there is no permit at this time it the rangeland health conditions indicate that the past permitted use exceeded the capabilities of the allotment.

This history indicates that there was no consideration for multiple resources dependent on the vegetative resource in one way or another. It simply allocated all AUMs that were on the ground for use by wildlife or livestock.

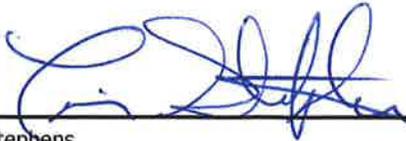
5.0 Resource Specialist Signatures

X

X


John Elliott
Supervisory Rangeland Management Specialist 5-6-15

X


Tim Stephens
Wildlife Habitat Biologist

X


Jared Dalebout
Hydrologist

X


Michael J. Phillips
Assistant Field Manager - Resources 5/7/15

7.0 REFERENCES

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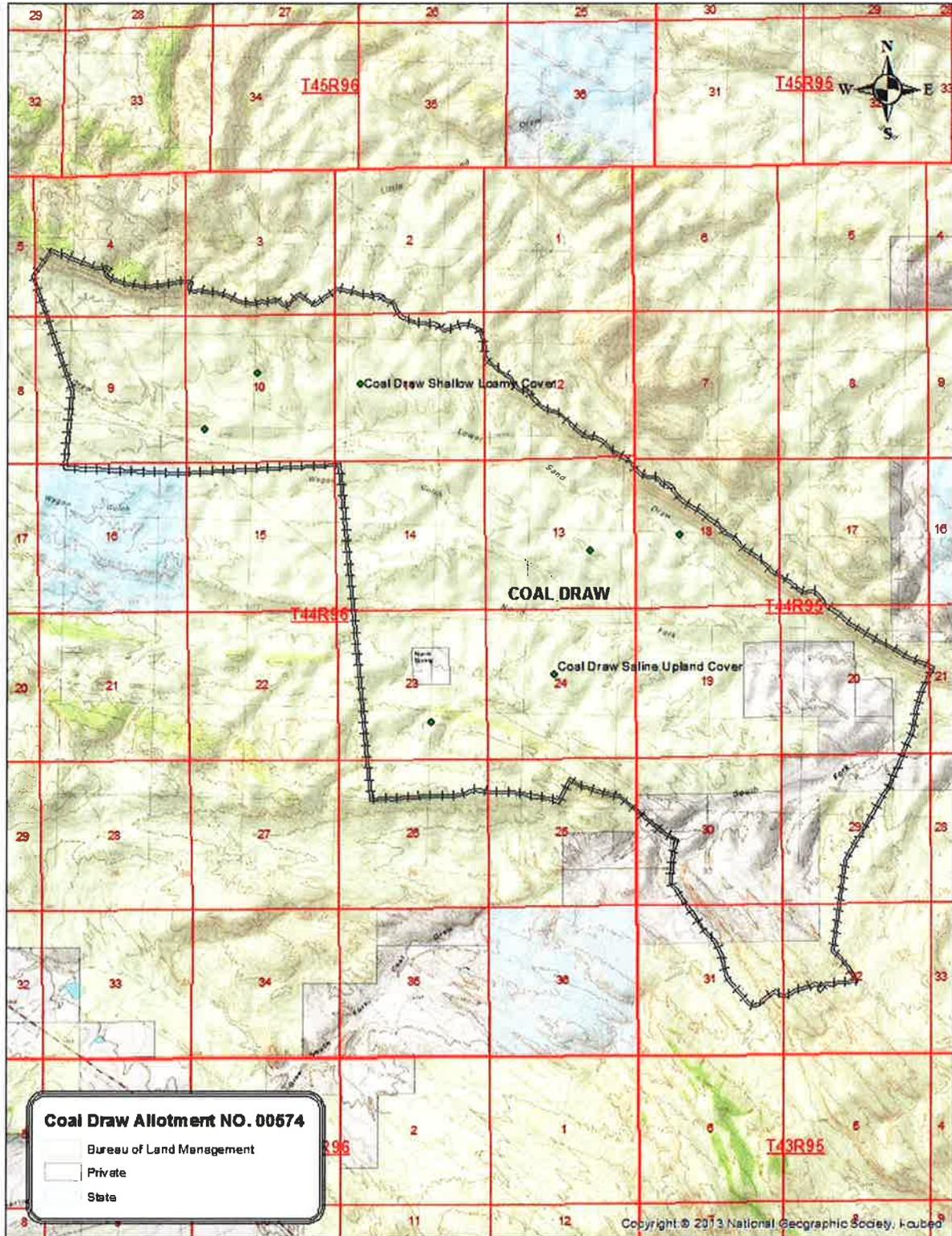
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Wyoming DEQ 2012 305b Report

Allotment Map (Not to Scale)



Wildlife Habitat Resources

