Rangeland Health Assessment

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

Honey Combs Allotment No. 00107

DRAFT

BLM

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

FY2013/14

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PUBLICATION INDEX NUMBER.
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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 Honey Combs Allotment No. 00107. 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.

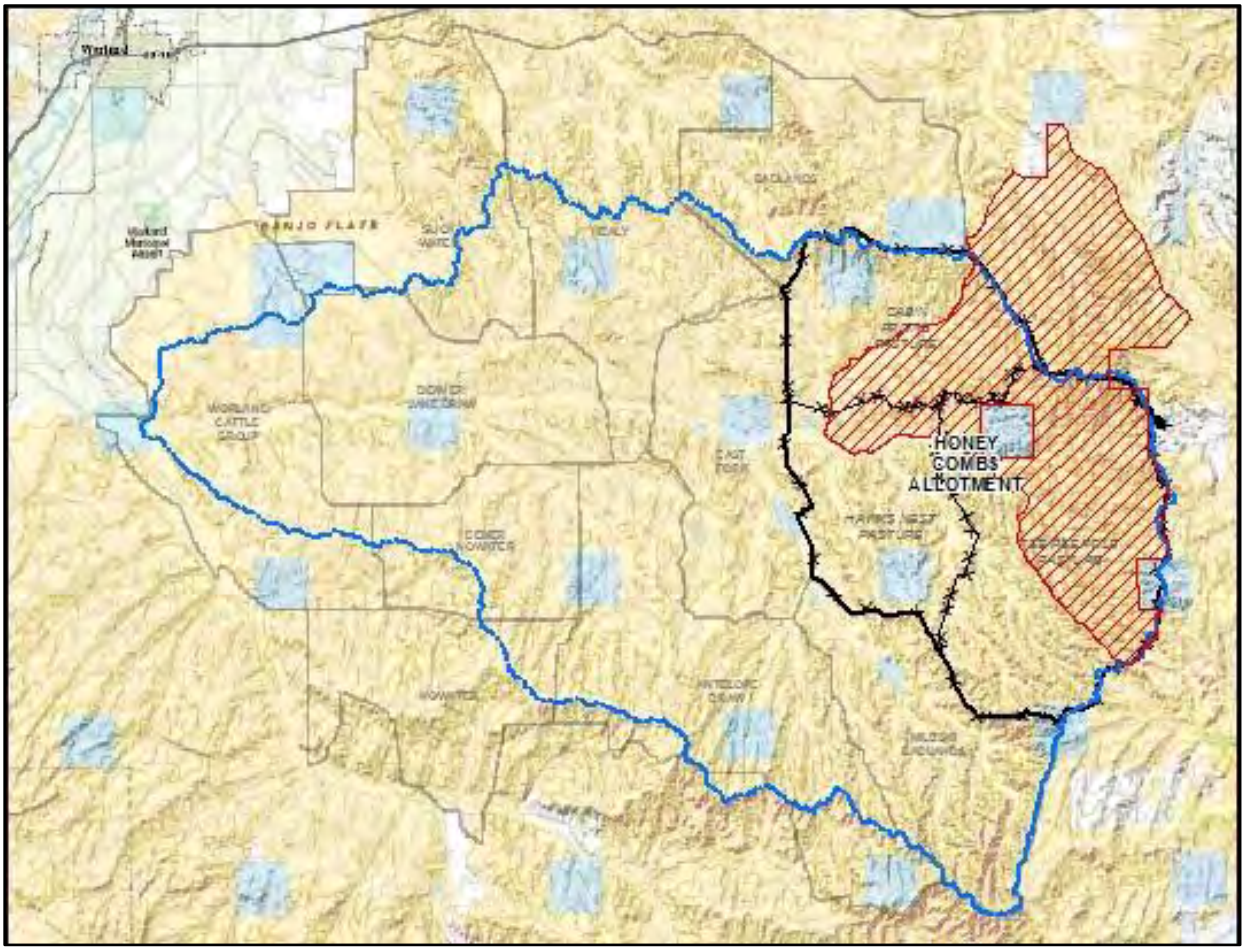
Standard #5: Water quality meets State standards

Standard #6: Air quality meets State standards

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

2.1 Location and Land Ownership

The Honey Combs Allotment is located approximately 20 miles south-east of Worland, WY. The allotment encompasses approximately 29,158 acres of public land, and 2,430 acres of Wyoming state lands. For management priorities, the allotment is classified in the "I" (Improve) category.



2.2 Climate/Air Quality

Annual precipitation for the Allotment ranges from 5-9 inches per year. The normal precipitation pattern shows peaks in May and June and a secondary peak in September. This amounts to about 50 percent of the mean annual precipitation. Much of the moisture that falls in the latter part of the summer is lost by evaporation and much of the moisture that falls during the winter is lost by sublimation. Average snowfall exceeds about 20 inches annually. Wide fluctuations may occur in yearly precipitation and result in more dry years than those with more than normal precipitation.

Temperatures show a wide range between summer and winter and between daily maximums and minimums, due to the high elevation and dry air, which permits rapid incoming and outgoing radiation.
Cold air outbreaks from Canada in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Chinook winds may occur in winter and bring rapid rises in temperature. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring.

High winds are generally blocked from the basin by high mountains, but can occur in conjunction with an occasional thunderstorm.

Growth of native cool-season plants begins about April 1 and continues to about July 1. 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 "Emblem" climate station:

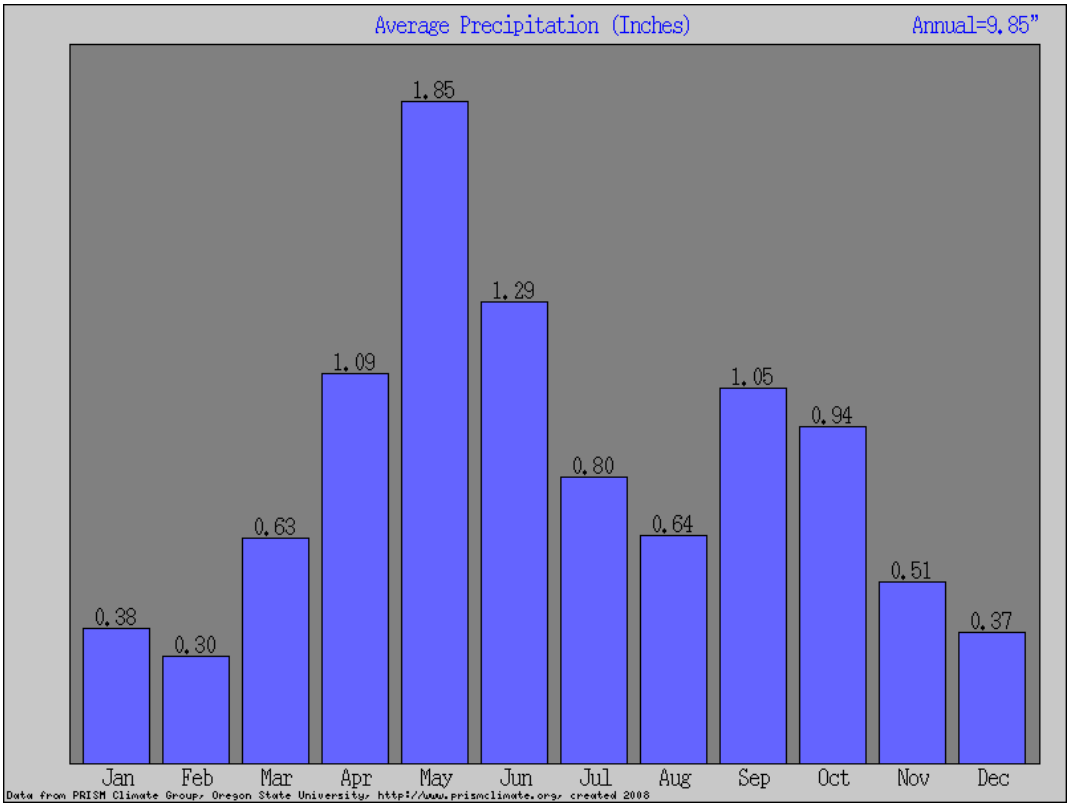
	Minimum	Maximum	5 yrs. out of 10 between
Frost-free period (days):	98	171	May 13 – September 19
Freeze-free period (days):	120	184	May 1 – October 5
Mean Annual Precipitation (inches):	3. 22	10.97	

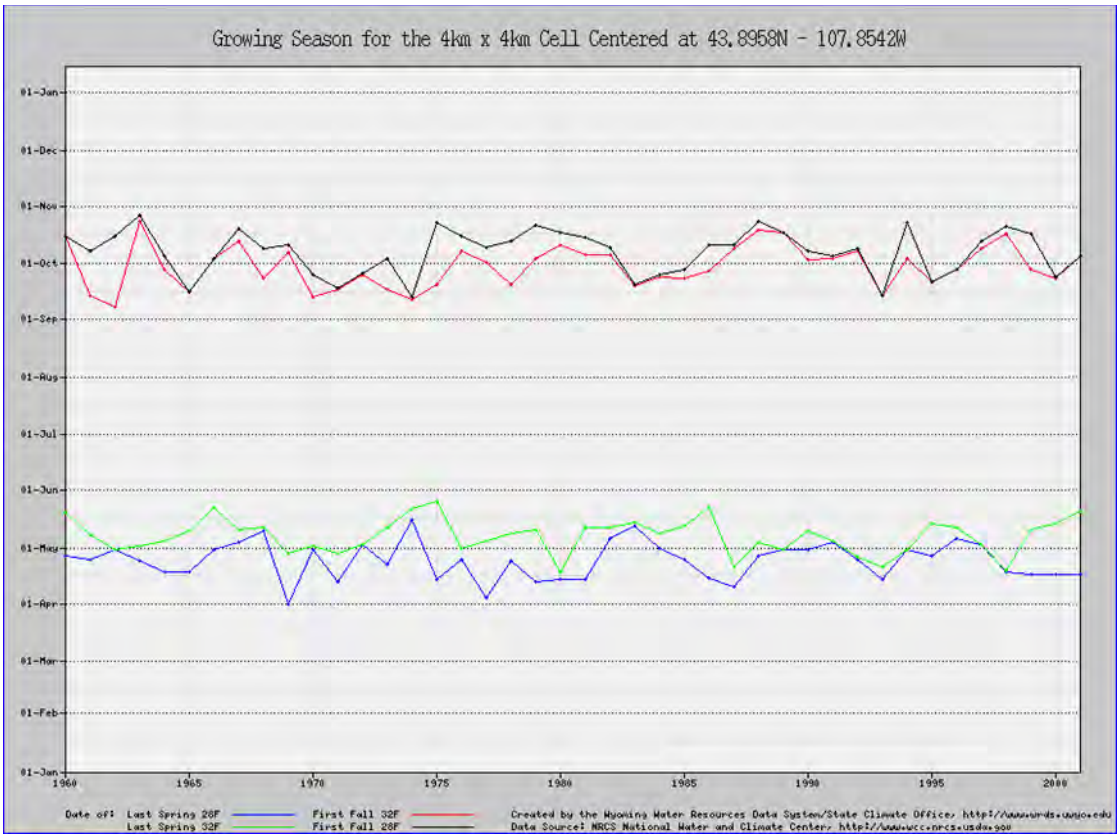
Mean annual precipitation: 7.42 inches
Mean annual air temperature: 45.01°F (31.2°F Avg. Min. to 58.7°F Avg. Max.)

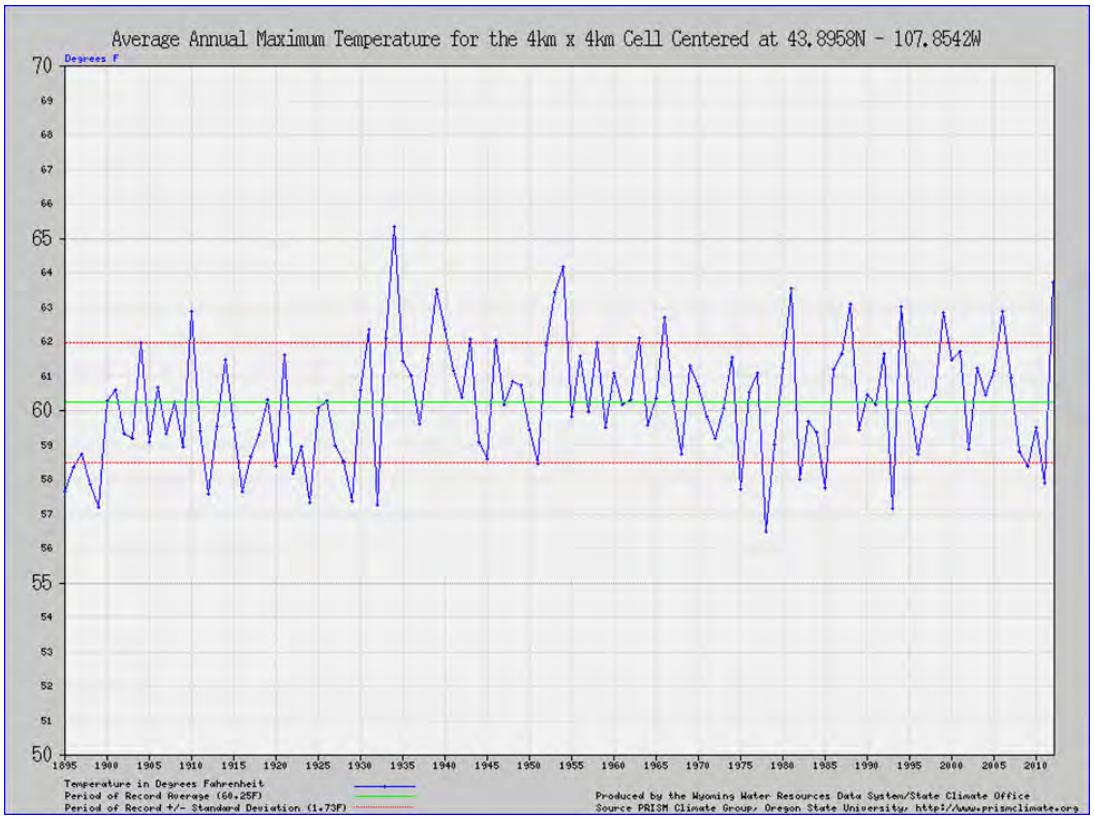
For detailed information visit the Natural Resources Conservation Service (NRCS) National Water and Climate Center at http://www.wcc.nrcs.usda.gov/ website. Other climate station(s) representative of this precipitation zone include "Basin", "Deaver", "Lovell" and "Worland", (Information taken from the United States Department of Agriculture (USDA) NRCS Technical Guide Section IIE Rev. 08/12/05).

Precipitation in the area has average 7.67 inches over the last 30 years (1984 – 2013) according to the Demer Rain Gauge located near the allotment.

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 43.8958 N, 107.8542 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. 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.




Growing Season for the 4km x 4km Cell Centered at 43.8958N - 107.8542W
01-Jan
01-Dec
01-Nov
01-Oct
01-Sep
01-Aug
01-Jul
01-Jun
01-May
01-Apr
01-Mar
01-Feb
01-Jan
1960
1965
1970
1975
1980
1985
1990
1995
2000
Date of: Last Spring 28F
Last Spring 32F
First Fall 32F
First Fall 28F
Created by the Wyoming Water Resources Data System/State Climate Office, http://www.wrds.uwyo.edu
Data Source: NRCS National Water and Climate Center, http://www.wcc.nrcs.usda.gov


Average Annual Maximum Temperature for the 4km x 4km Cell Centered at 43.8958N - 107.8542W
Degrees F
70
69
68
67
66
65
64
63
62
61
60
59
58
57
56
55
54
53
52
51
50
1895
1900
1905
1910
1915
1920
1925
1930
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
Temperature in Degrees Fahrenheit
Period of Record Average (60.25F)
Period of Record +/- Standard Deviation (1.73F)
Produced by the Wyoming Water Resources Data System/State Climate Office
Source PRISM Climate Group, Oregon State University, http://www.prismclimate.org

The maximum and minimum elevations for each allotment within the East Fork Nowater Creek watershed were calculated along with the average slope given in percent rise for each 10 meter digital elevation grid. The Honey Combs allotment positioned at the top of the watershed and has the highest elevation of 5341 feet above sea level.

Allotment	Max Elev (ft)	Min Elev (ft)	Average Elev (ft)	Average Slope (% Rise) 10m
Honey Combs	**5341**	**4373**	**4669**	**17.0**
Worland Cattle Group	4577	4134	4327	8.2
Denver Jake	4550	4216	4367	9.0
Demer Nowater	4705	4311	4491	10.0
East Fork	4751	4321	4488	13.0
Antelope Draw	5335	4331	4692	16.4
Mileski	5508	4452	4803	13.0
Healy	4810	4301	4521	14.0
Slickwater	4665	4176	4403	12.7
Nowater	4849	4298	4570	15.2
Badlands	5013	4465	4715	18.0

The high average slope (17%) for the Honey Combs allotment is due to the badland topography of the entire eastern sections of the allotment.

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 5 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.

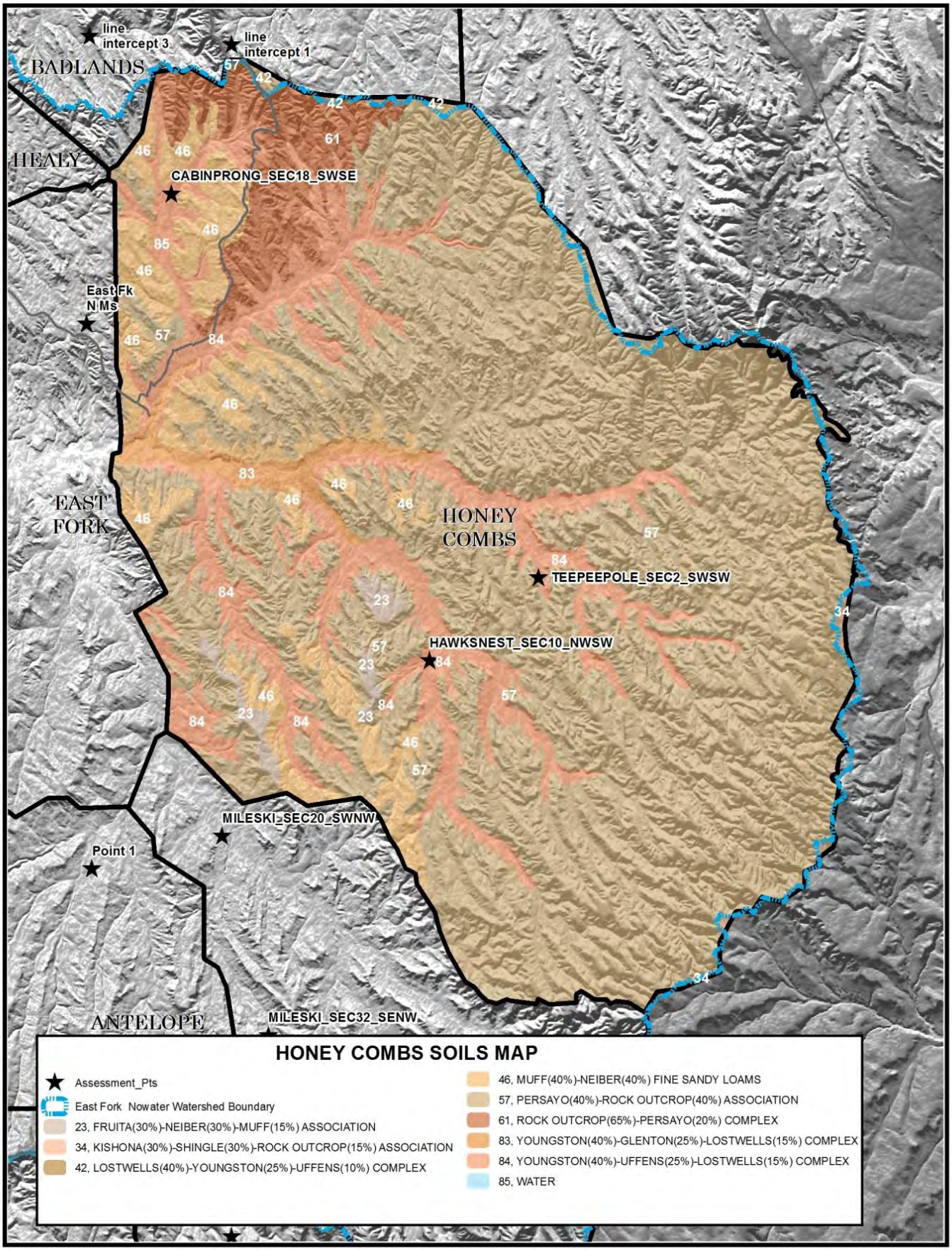
The topography is rough and hilly, with large draws bisecting the area. The majority (68%) of the allotment consists of Badlands/Rock outcrop association type soils with moderate to severe sheet and gully erosion and has a thin or unstable topsoil or in some instances, no topsoil.

The Honey Combs Allotment is situated within the 5-9 inch Big Horn Basin (BH) 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
23	Fruita-Neiber association, 1-30% Slopes	261	Moderately deep, well drained soils. Fruita found on fans, Neiber on uplands. Formed in alluvium often derived from sand stone. Fine sandy loam.	Loamy, 5-9bh, R032XY122WY Shallow Loamy, 5-9bh R032XY162WY
46	Muff-Neiber fine sandy loans, 3-30% Slopes	2,577	Moderately deep, well drained soils on hillsides and ridges of uplands. Muff formed in material derived from shale, Neiber from sandstone. Mildly to moderately alkaline. Slow permeability and moderate water capacity. Fine sandy loam.	Loamy, 5-9bh, R032XY122WY
57	Persayo-Rock outcrop association, 15-40% Slopes	21,721	Shallow, well drained soils on ridges, hills that are dissected by numerous dendritic drainage ways, and escarpments. These soils formed in material derived from shale. Moderate to strongly alkaline. Loam.	Shale/Rock Outcrop 5-9bh, R032XY154WY
61	Rock outcrop-Persayo complex, 15-70 % slopes	1,481	This map unit is on dissected, hilly to very steep uplands. Runoff is rapid, and the hazard of water erosion is high. This soil is saline. Permeability is moderately slow. Available water capacity is very low.	Rock Outcrop
83	Youngston-Gienton complex, 0-3 % slopes	502	Deep and well drained soils on alluvial fans and flood plains of intermittent streams. Permeability of the Glenton soil is moderately rapid, Youngston moderately slow. Available water capacity is high to moderate. Loam, fine sand, and sandy loam	Saline Lowland 5-9bh, R032XY138WY
84	Youngston-Uffens-Lostwells complex, 1-10% Slopes	4,582	Deep, well drained soils on terraces, fans, and flood plains and in valley floors. Formed in material derived from alluvium. Moderate to strongly alkaline. Sandy clay loam.	Saline Upland 5-9bh, R032XY144WY Saline Lowland 5-9 bh, R032XY138WY

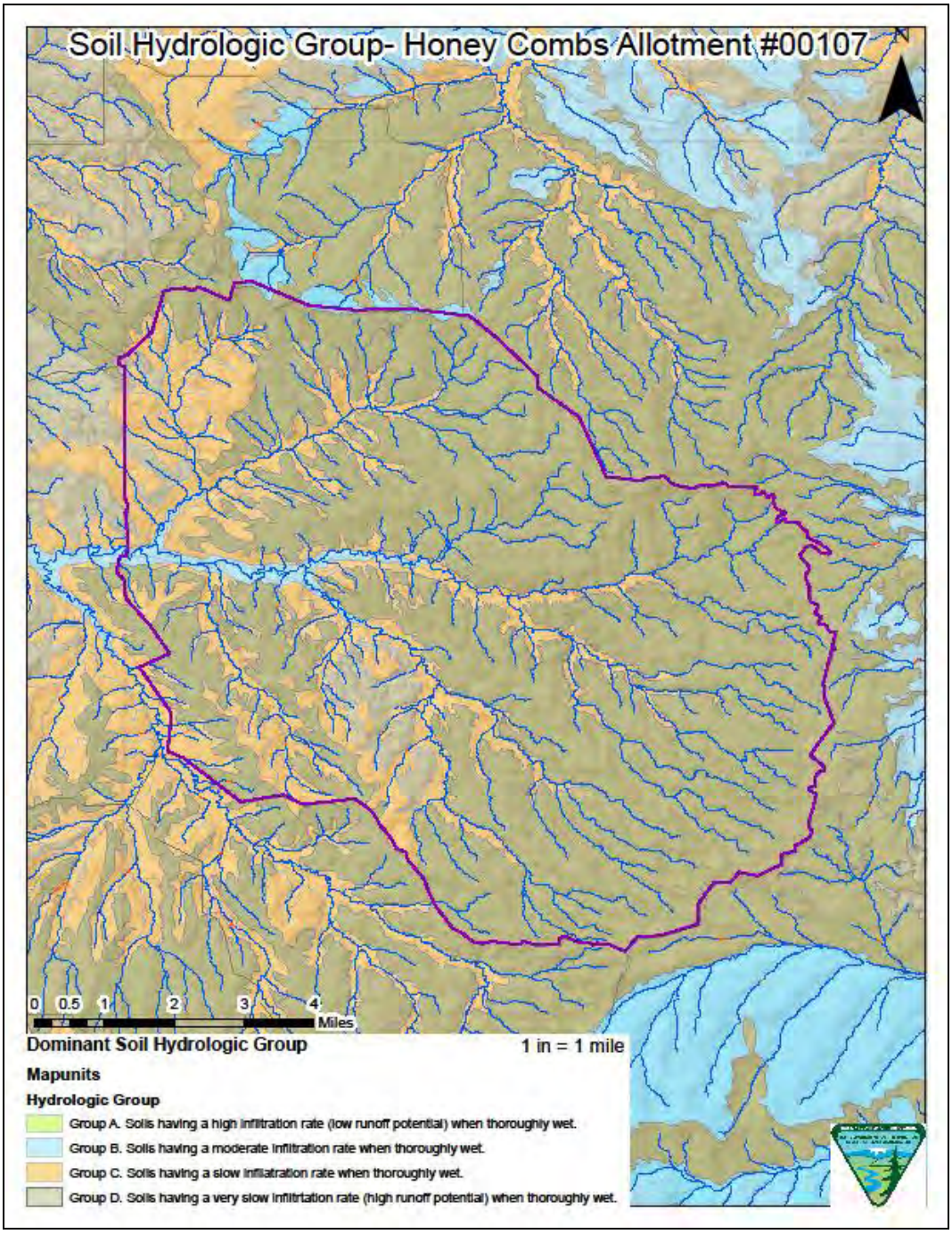
Three rangeland health assessments utilizing the methodology described in *Interpreting Indicators of Rangeland Health, BLM Technical Reference 1734-6*, were relied upon in the analysis of the Honey Combs Allotment. The assessments were conducted at monitoring sites selected for this analysis. The table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

Soil Features	CABINPRONG_ SEC18_SWSE	TEEPEEPOLE_ SEC2_SWSW	HAWKSNEST_ SEC10_NWSW
Soil Name	Muff-Neiber fine sandy loams, 3-30% Slopes	Fruita-Neiber association, 1-30% Slopes	Fruita-Neiber association, 1-30% Slopes
Ecological Site	Loamy 5-9bh	Shallow Loamy 5-9bh	Loamy 5-9bh
Parent Material Kind	alluvium	alluvium	alluvium
Parent Material Origin	sandstone, shale	shale	shale
Surface Texture	silty clay loam	clay loam	loam
Ph	8.1	8.4	7.0


line intercept 3
line intercept 1
BADLANDS
HEALY
CABINPRONG_SEC18_SWSE
East Fk N Ms
EAST FORK
HONEY COMBS
TEEPEEPOLE_SEC2_SWSW
HAWKSNEST_SEC10_NWSW
MILESKI_SEC20_SWNW
Point 1
ANTELOPE
MILESKI_SEC32_SENW
HONEY COMBS SOILS MAP
Assessment_Pts
East Fork Nowater Watershed Boundary
23, FRUITA(30%)-NEIBER(30%)-MUFF(15%) ASSOCIATION
34, KISHONA(30%)-SHINGLE(30%)-ROCK OUTCROP(15%) ASSOCIATION
42, LOSTWELLS(40%)-YOUNGSTON(25%)-UFFENS(10%) COMPLEX
46, MUFF(40%)-NEIBER(40%) FINE SANDY LOAMS
57, PERSAYO(40%)-ROCK OUTCROP(40%) ASSOCIATION
61, ROCK OUTCROP(65%)-PERSAYO(20%) COMPLEX
83, YOUNGSTON(40%)-GLENTON(25%)-LOSTWELLS(15%) COMPLEX
84, YOUNGSTON(40%)-UFFENS(25%)-LOSTWELLS(15%) COMPLEX
85, WATER

Hydrologic Group B, C and Hydrologic Group D soils %

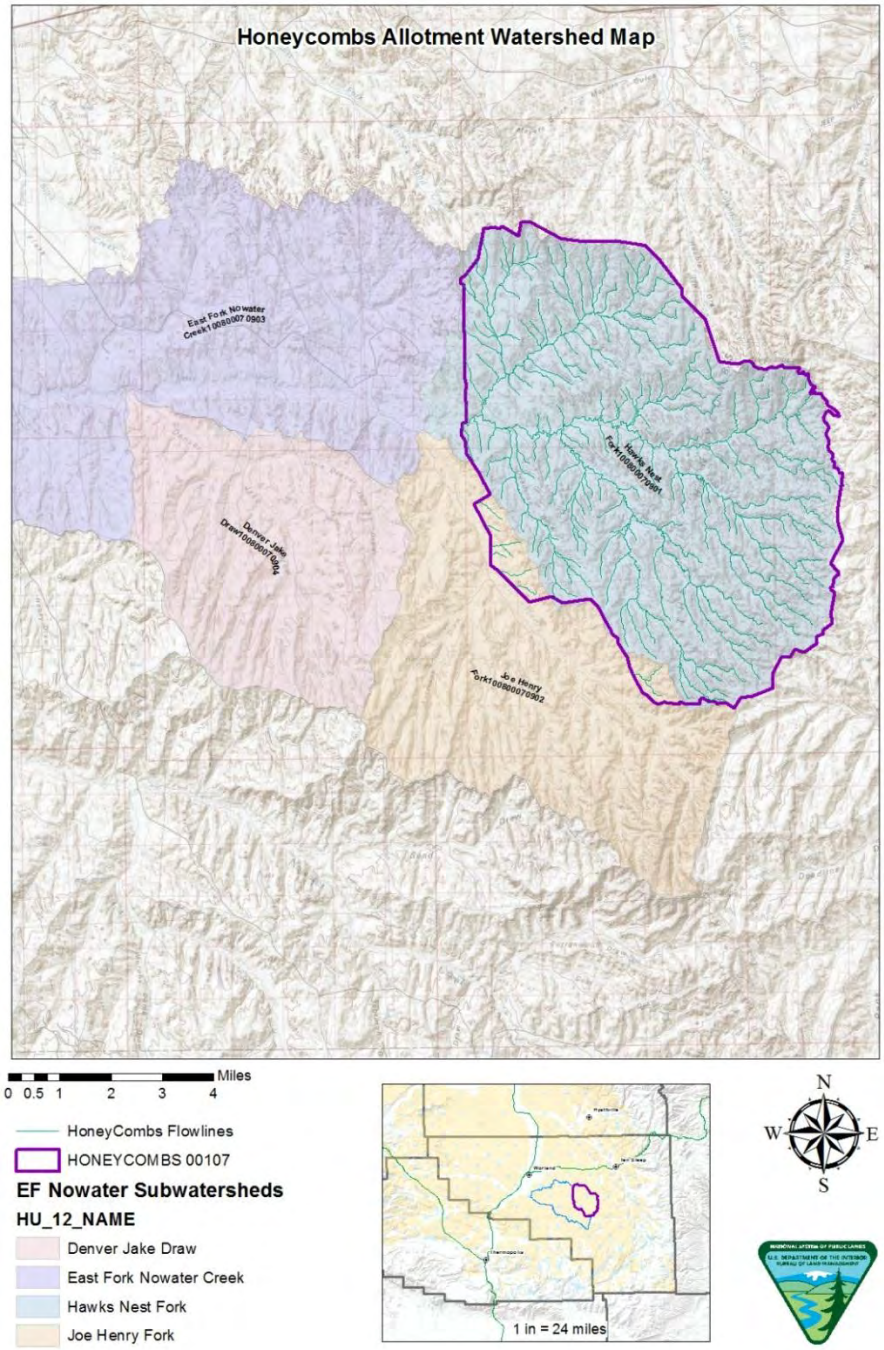
The soil hydrologic group displays the distribution of the dominant soil hydrologic group that is assigned to the watershed. Group B type soils are those with moderate/high infiltration rates, locally in the watershed these areas are located within the floodplain area of the East Fork of Nowater and other sandy ranges sites in the Sand Creek and East Fork Nowater watersheds. The group C soils are from loamy range sites in the watershed. The group D soils are very common in the eastern and badland sections of the watershed where rock out crops are common and the depth to the bedrock is less than 50 centimeters.



2.4 Hydrology / Riparian

2.4.1 Surface Water/Watershed

The Honey Combs allotment falls entirely within the East Fork Nowater Creek USGS (level #5) watershed. The allotment contains the upper reaches of the Hawks Nest Fork which is a sub-watershed (level #6) in the East Fork of Nowater Creek. The allotment consists of 95.5% of the total area of the Hawks Nest Fork sub-watershed. There is also portion of the allotment located within the Joe Henry sub-watershed (1148 acres) that consists of 5.7 % of the Joe Henry sub-watershed.



Watersheds			
Watershed (HUC) Level #6	**Acres (mi²)**	**Acres (mi²) Within Allotment**	**% of Acres of Watershed in the Allotment**
East Fork Nowater Creek- Hawks Nest Fork (100800070901)	31218 (49)	29806 (46.6)	95.5
East Fork Nowater Creek- Joe Henry Fork (100800070903)	20013 (31.3)	1148 (1.8)	5.7

The total length of ephemeral/intermittent channels for the Honey Combs allotment is 179.6 total miles that are within the East Fork Nowater Creek. The Honey Combs allotment is contains the most amounts of drainages and channels, compared to other allotments in the watershed, and consist of 25 percent of the total length of the East Fork Nowater Creek.

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.

Allotment	Total Miles Intermittent/Ephemeral Channels	Watershed (HU 10) East Fork Nowater	(%) of Total East Fork Nowater	Nowood R-Sand Ck	Bighorn R-Sage/Slick Ck	Nowood R-Big Cottonwood Ck	Nowater Ck
HoneyCombs	**179.6**	**179.6**	**25**	**0**	**0**	**0**	**0**
Total	**1035.8**	**712.3**	**100.0**				

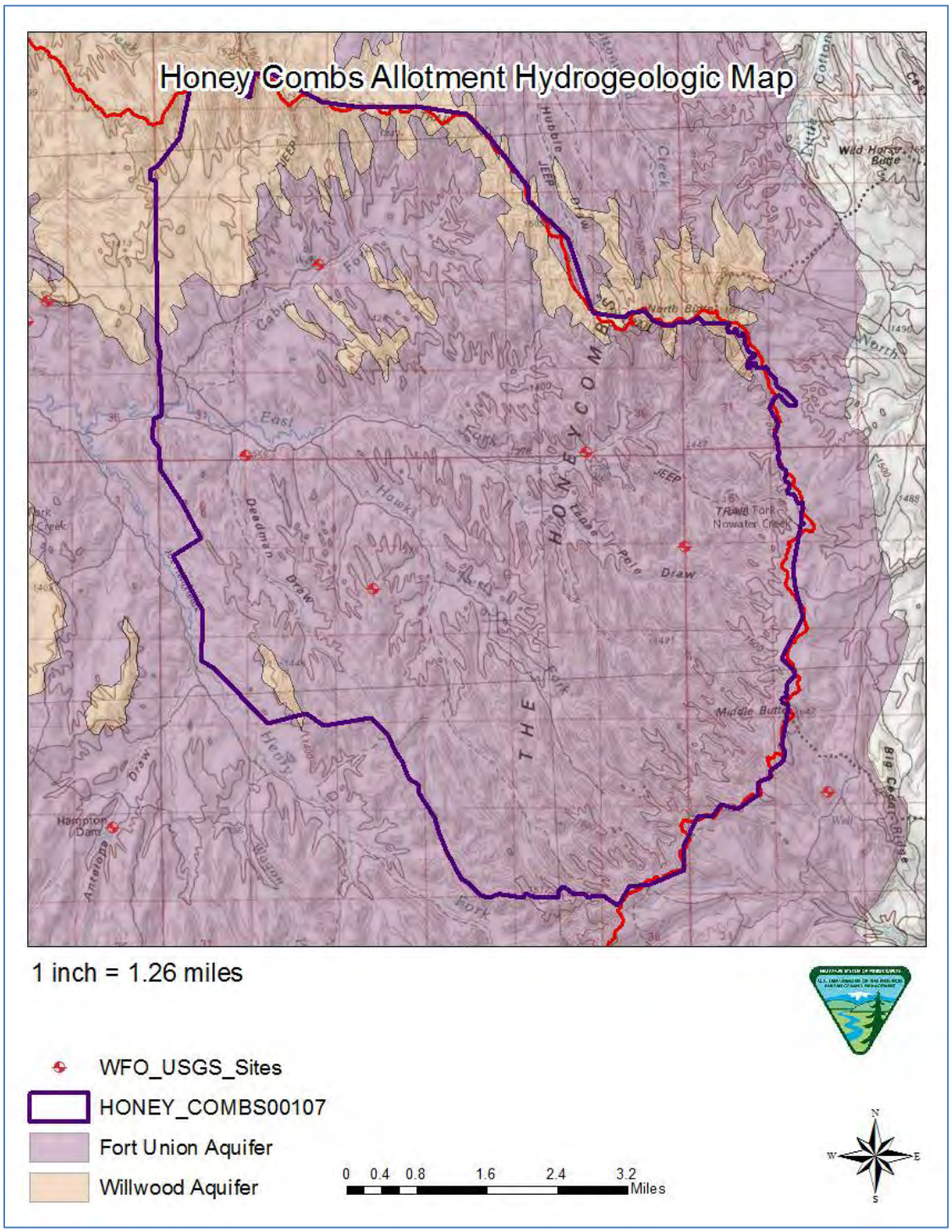
Rosgen Types- The channels within the watershed are dominantly Rosgen G5 type streams that are defined as (Rosgen,1996) entrenched, narrow, and deep channels with a low to moderate sinuosity. These types have high bank erosion rates and a high sediment supply. The main channel material or d50 for the Joe Henry Fork is a classified as sand material size. 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). 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 East Fork Nowater Creek sub-watershed. They contain highly weathered rock and erodible materials, and high lateral extension rates and bar deposition following infrequent storm events. Other less entrenched reaches of the East Fork Nowater Creek and tributaries such as Joe Henry Fork are classified as Rosgen C5 channels, when healthy, where there is still periodic flooding and access to the floodplain from high flow events. The average main channel slope is the low (0.87) 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 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.

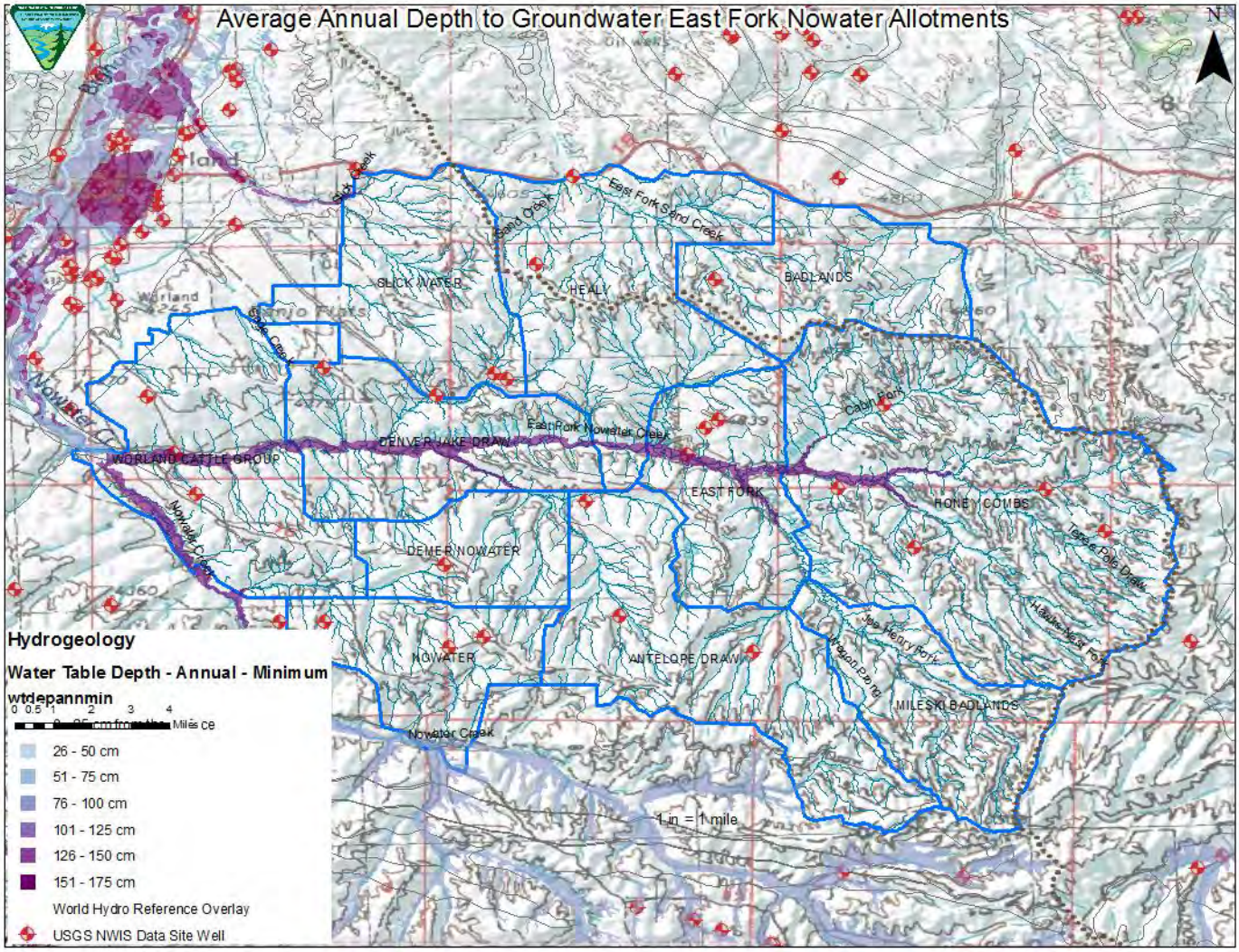
Allotment	Main Channel	Average Main Channel Slope	Rosgen Channel Types
Honey Combs	East Fork Sand Creek	0.87	G5b,F5b

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 Tertiary aged outcrops of the Willwood and Fort Union Formations. The northwestern sections of the allotment are dominantly mapped as the Tertiary Willwood Formation. The majority of the allotment is mapped as the Fort Union Formation. There are minor amount of Quaternary alluvium and colluvium unconsolidated deposits along the lower portions of the main drainages.



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 Honey Combs allotment. There are no known springs or seeps in the allotment. There are 8 ground water wells on record with either the BLM and/or the Wyoming State Engineers office.



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.

2.4.3 Water Quality (Surface)

The main drainages of East Fork Nowater and other tributaries 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. 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 East Fork Nowater Creek and Hawks Nest Fork are the main drainages in the allotment. The lower portions of these drainages, where the contributing surface area is the highest and the slopes are less than 2 percent, has a sporadic woody component of Cottonwood trees located along the floodplain of the creek. These stands are supported by groundwater that is at depths greater than 170 centimeters throughout the year. The depth to available water prohibits the establishment of a herbaceous riparian/wetland area.

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: Shale, Rock Outcrop, Loamy, Shallow Loamy, Saline Upland, and Saline Lowland. Shale, Rock Outcrops sites are considered Badlands or waste areas and make up 68% of the allotment's acres. Small side drainages have large, flat flood plains which make up the Shallow Loamy, Loamy, and Saline Upland ecological sites. Saline Lowland and overflow sites are found in the main drainages of the Hawks Nest Prong, Teepee Pole Prong, and East Fork Nowater.

Plant composition within the allotment observed on July 2013on a variety of different range sites included: Needle&Thread (*Hesperostipa comata*), Bluebunch wheatgrass (*Pseudoroegneria spicata*), Bottlebrush squirreltail (*Elymus elymoides*), Alkali sacaton (*Sporobolus airoides*), Blue grama (*Bouteloua gracills*), Sandberg bluegrass (*Poa secunda*) Western wheatgrass (*Pascopyrum smithii)*, Cheatgrass (*Bromus Tectorum*), Plains pricklypear (*Opuntia polyacantha*), Scarlet globemallow (*Sphaeralcea coccinea*), Woody aster (*Xylorhiza glabriuscula*), Bitter root (*Lewisia rediviva*), 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)* and numerous annual forbs are common throughout the allotment, and in some areas, particularly the drainage bottoms and first level terraces, they are the dominant vegetation. No known threatened or endangered plant species have been documented in the allotment.

2.6 Invasive Species

Noxious weed species inventoried within the allotment include saltcedar (*Tamarix chinensis*) Russian olive (*Eleganus angustifolia*) and Canada thistle (*Cirsium arvense).* Occurrence is primarily near roads and reservoirs or other previously disturbed areas. Cheatgrass (Bromus tectorum) is also within the allotment-it is readily observed in some areas of the allotment while non-existent or nearly so in other areas of the allotment.

2.7 Livestock Grazing Management

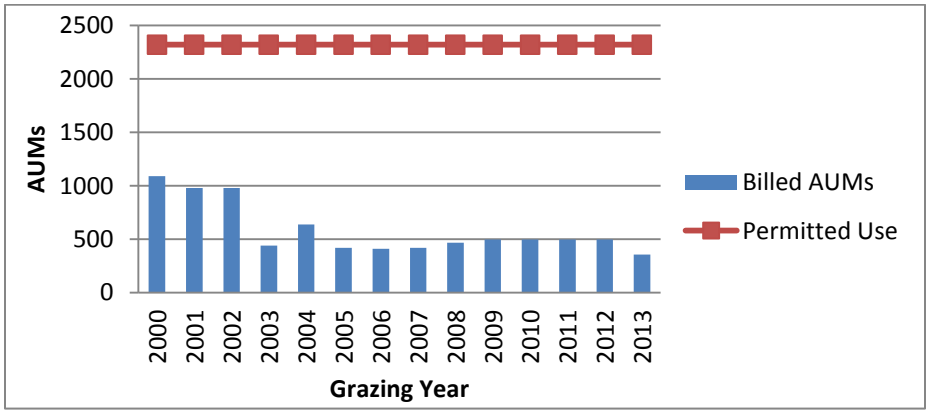
The Honey Combs Allotment is permitted for cattle grazing in the spring and fall. A total of 2,320 animal unit months (AUMs) of livestock grazing use are permitted under authorization 4915264 as follows:

200 Cattle	04/01-04/20	92% Public Land	121 AUMs
200 Cattle	04/10-6/30	92% Public Land	496 AUMs
400 Cattle	4/21-6/30	92% Public Land	859 AUMs
500 Cattle	10/19-2/15	92% Pubic Land	1,815 AUMS

The allotment consists of three pastures. Cabin Prong, Hawks Nest, and Teepee Pole. An Allotment Management Plan (AMP) was initiated in 1971 setting up a rest-rotation grazing system for the three pastures on a two year cycle. Many range improvement project were funded by both BLM and the permittee with plans to repair or update reservoirs, water wells, and fence lines. However there is no record that the AMP was ever followed after passage of the Wyoming Wilderness Act of 1984. Since a large portion of the allotment is within the Honeycombs Wilderness Study Area (WSA) many of the Range Improvement projects were not maintained thus making it difficult to follow the AMPs schedule.

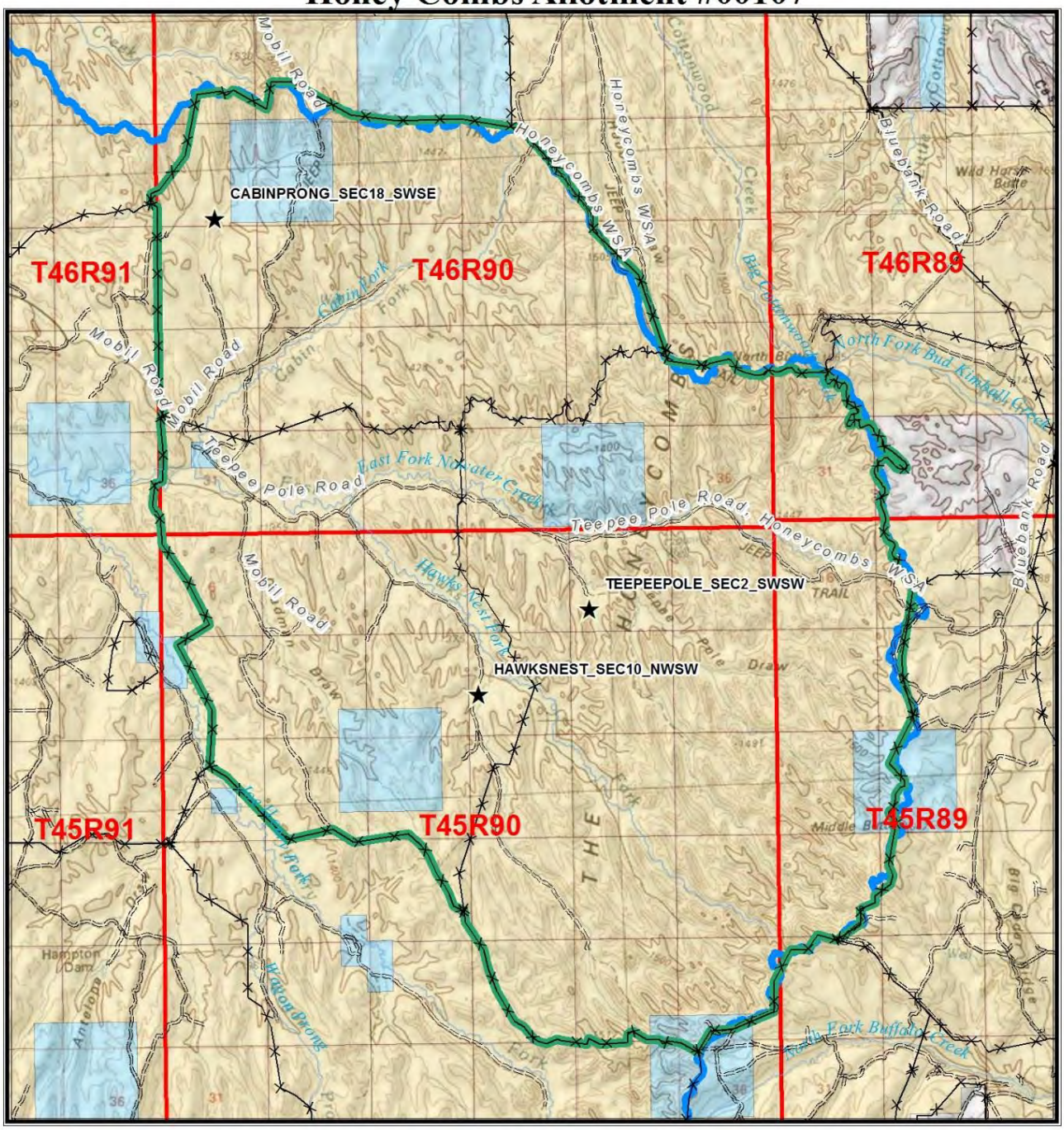
The calculated livestock grazing use for the last 30 years is shown below. Use has been averaged by decade and is spring or warms season use only, winter AUMs were rarely used. No records were found that indicated which pasture was used, however it was typical that only one pasture was used at a time.

Years	Average Billed AUMs
1984-1993	1040
1994- 2003	840
2004-2013	463



Since 2000, livestock grazing use has averaged 59% of permitted use in the spring, 0.6% of permitted use in the fall/winter, and 56% of permitted use overall.

Honey Combs Allotment #00107



★ Assessment Points

Allotment Boundary

East Fork Nowater Watershed

BLM

State

Private

WORLAND FIELD OFFICE

0 0.5 1 1.5 2

Miles

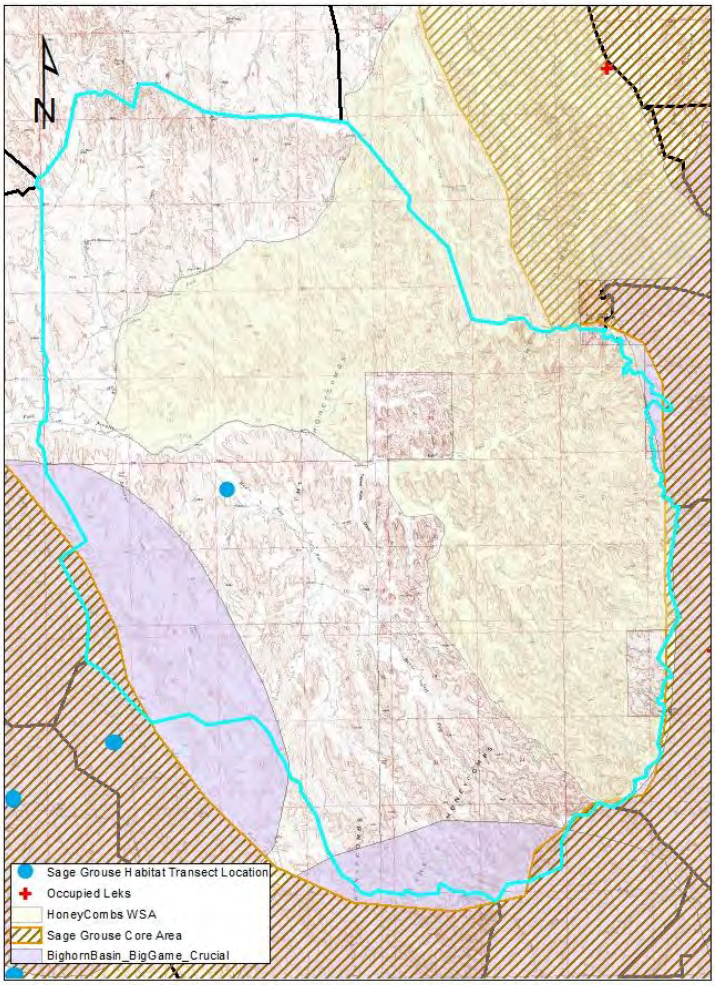
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

N W E S

2.8 Wildlife

Wildlife habitat in the Honey Combs allotment is suitable for a wide range of wildlife species. Big game, non-game, and sensitive wildlife species can all be found there. Approximately two-thirds of the allotment is characterized by rough, sparsely vegetated, and deeply incised drainages generally referred to as badlands. Drainages within the allotment flow into the East Fork of the Nowater on the western side and generally into the Nowood River on the east side of the allotment. The vegetation is characterized by a mix of Wyoming big sagebrush, perennial grasses, prickly pear cactus, annual grasses, and cheatgrass. Mule deer and antelope use the allotment year-round with higher concentrations of mule deer utilizing it during late fall and winter. Antelope may be observed throughout the allotment year-round. Historically there have been numerous raptors sighted along western side of the allotment near the East Fork drainage with historical reports of nesting activity along the lower areas. Only the southern and southwestern border areas of the allotment lie within designated big game crucial winter range, and only small fringe areas of the allotment are within a sage grouse core breeding area. The allotment does not contain identified sage grouse winter range. The allotment provides habitat for a wide range of small mammals and predators such as mountain lions coyotes, and bobcats, as well as numerous grassland passerines, sage grouse, and numerous raptor species. No sage grouse leks are within the allotment boundary.

Honey Combs Allotment Wildlife Habitat Map



2.9 Threatened, Endangered, Candidate, or Sensitive Species

No known threatened or endangered species have been identified on the allotment, however Greater sage grouse, a BLM senstive species, can be found there at various seasons of the year. Various additional sage brush obligate avian species such as the Sage sparrow, Brewer's sparrow, and Sage Thrasher may also utilize habitat within the allotment.

3.0 Summary of Monitoring Data / Assessments

3.1 Monitoring Data

In the summer of 2013, three vegetation monitoring sites were selected in the allotment as part of the Rangeland Health Assessment process. In addition to the Rangeland Health assessments three other monitoring sites were established using Line Point Intercept to verify the representation of the main assessment sites. 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 2.7 illustrates the monitoring site locations.

Rangeland Health Assessments were conducted at the monitoring sites by an interdisciplinary team on 09/09/2013 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**	
	TEEPEEPOLE SEC2_SWSW	**HAWKSNEST SEC10_NWSW**
1. Rills	M	N-S
2. Water-flow patterns	M-E	S-M
3. Pedestals and/or terracettes	S-M	S-M
4. Bare ground	S-M	N-S
5. Gullies	M	S-M
6. Wind-scoured, blowouts, and/or deposition areas	N-S	N-S
7. Litter movement	S-M	N-S
8. Soil surface resistance to erosion	M	S-M
9. Soil surface loss or degradation	S-M	S-M
10. Plant community composition and distribution relative to infiltration	M	S-M
11. Compaction layer	N-S	N-S
12. Functional / structural groups	M-E	M-E
13. Plant mortality / decadence	N-S	N-S
14. Litter amount	S-M	N-S
15. Annual production	N-S	S-M
16. Invasive plants	M	M
17. Reproductive capability of perennial plants	N-S	N-S
Indicator Summary		
Soil / Site Stability (*Indicators 1-9, 11*)	**M**	**S-M**
Biotic Integrity (*Indicators 8-9, 11-17*)	**M**	**S-M**
Hydrologic Function (*Indicators 1-5, 8-11, 14*)	**M**	**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.

TEEPEEPOLE_SEC2_SWSW Assessment Site: The overall soil/site stability rating for this sight was averaged to a "Moderate" departure from the reference state for a Shallow Loamy 5-9" site. Some of the individual indicators that showed greater concern based on their departure from the reference state as follows:
Rill formations were active in exposed areas, with frequent and 4-5 foot long segments. The number and length of flow patterns were extensive, numerous, long and connected. Active evidence of pedestaled plants and rocks were found throughout the site. Terracette patterns were observed and directly related to adjacent erosional sites. Bare ground areas were 5-6ft in width, with some patches connected in water flow patterns. The majority of gullies showed signs of active headcuting, nickpoints and active erosion. The SSI on the site was low at 3.5; the reference sheet places the average SSI at 4.0 or greater. Reduction in soil surface stability was found mainly in the interspaces between plants. Soil structure was degraded and soil organic matter content was greatly reduced as indicated by the 1.5 inch "A" horizon.

HAWKSNEST_SEC10_NWSW Assessment Site: The overall soil/site stability rating for this sight was averaged to a "Slight to Moderate" departure from the reference state for a Loamy 5-9" site. Some of the individual indicators that showed greater concern based on their departure from the reference state as follows:
The number and length of flow patterns were short and disconnected and nearly matched what was expected for the site; erosion was minor. Past evidence of pedestaled plants and rocks were found throughout the sites. No terracette patterns were observed. Gullies on the sites were present but low in numbers. The majority of active gullies found near road and smaller drainages. The SSI on the sites was 4.6; the reference sheet places the average SSI at 5.0 or greater. Reduction in soil surface stability was lower than what was expected and found mainly in the interspaces between plants. Soil structure was degraded and soil organic matter content was greatly reduced as indicated by the 2 inch "A" horizon.

3.3 Hydrology/Watershed

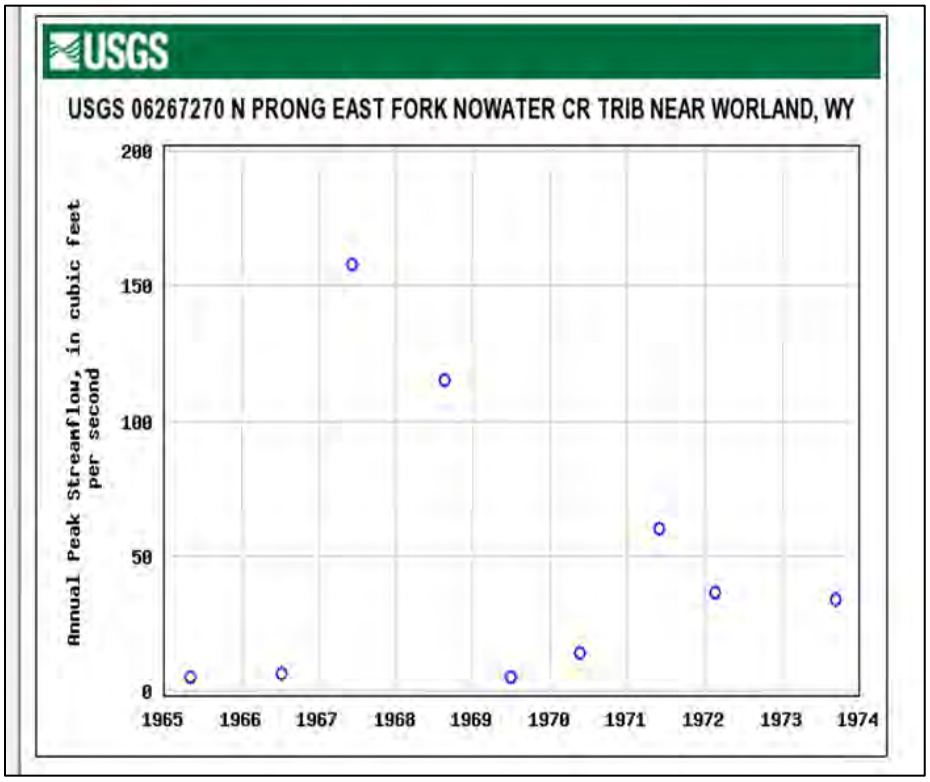
3.3.1 Surface Water

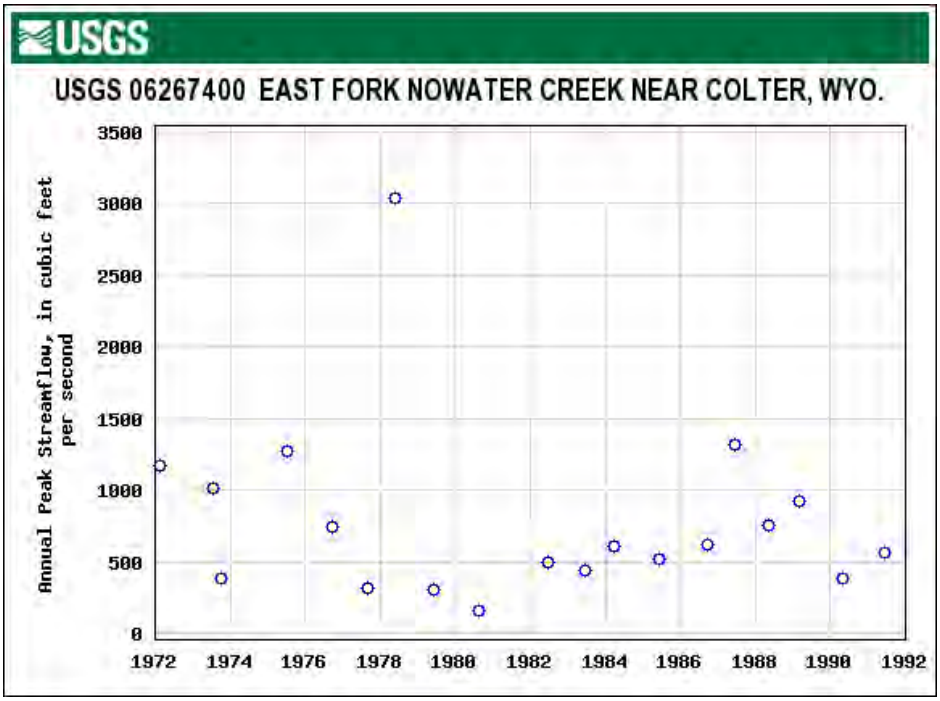
The nearest data is extrapolated from adjacent allotments that are within the same watershed. The flow data presented is to represent the overall conditions of the watershed.

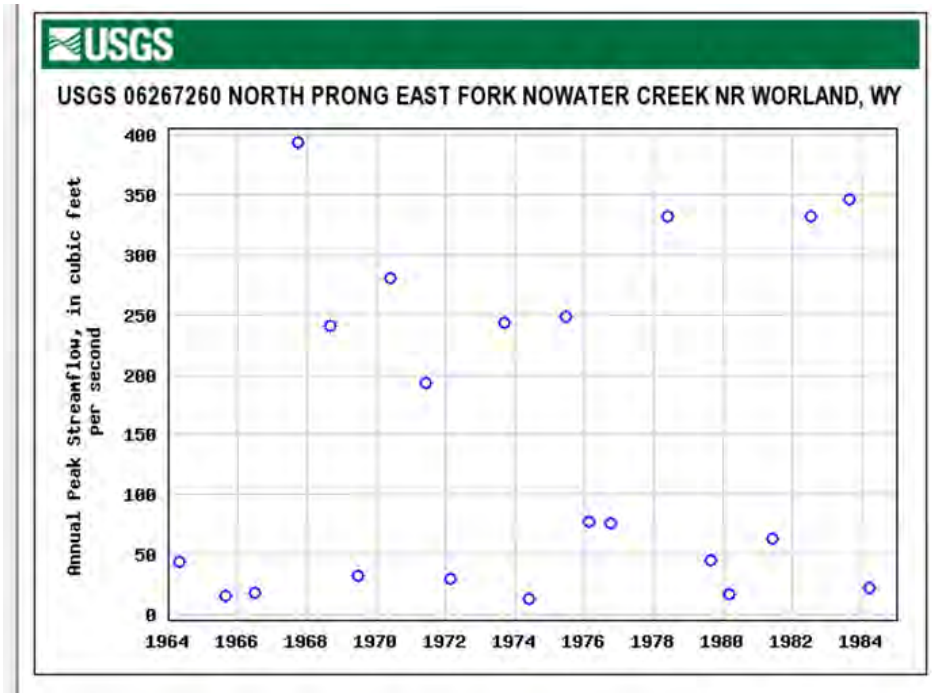
USGS Data- The USGS has historic data from two monitoring sites (06267260, 06267270) located in the T.46N. R.91W. Sections 18 and 19. These sites monitored peak flow from two tributaries to the East Fork of Nowater Creek with drainages areas of 1.7 and 2.11 miles. During the years from 1965-1984 the flows ranged from 5 cubic feet per second (cfs) to over 346 cfs mainly following 35 storm events in May and June. These sites represent the numerous smaller drainage areas from upland areas that are common within the East Fork watershed and are applicable to all of the allotments with similar ecological sites. These stations contain 20 years of historic runoff data and were collected for analysis of the runoff rates, and runoff volumes and correlated with other semi-arid sites throughout the state of Wyoming (See tables following). This was done in order to estimate runoff from rainfall on small basins in semiarid areas. This study included hydrologic modeling for runoff, rainfall, and other simulated runoff hydrologic curves for the small basin following natural and simulated rainfall events (Rankl, 1990).The physical attributes give an accurate estimate of flow volume generated from small drainages that are common within the allotment. The majority of the significant runoff events occur during the growing season months of April through October, the contributions of snowmelt runoff from the watershed was not considered significant (Craig and Rankl, 1978).

There is an historic surface water gauging stations located in the allotment. This USGS gauging station (USGS Site 06267400) is located at latitude 43°54'55", longitude 107°55'46" this station provides average and peak flow records along with water quality samples from 1971 through 1991 when the station was discontinued due to lack of funding.

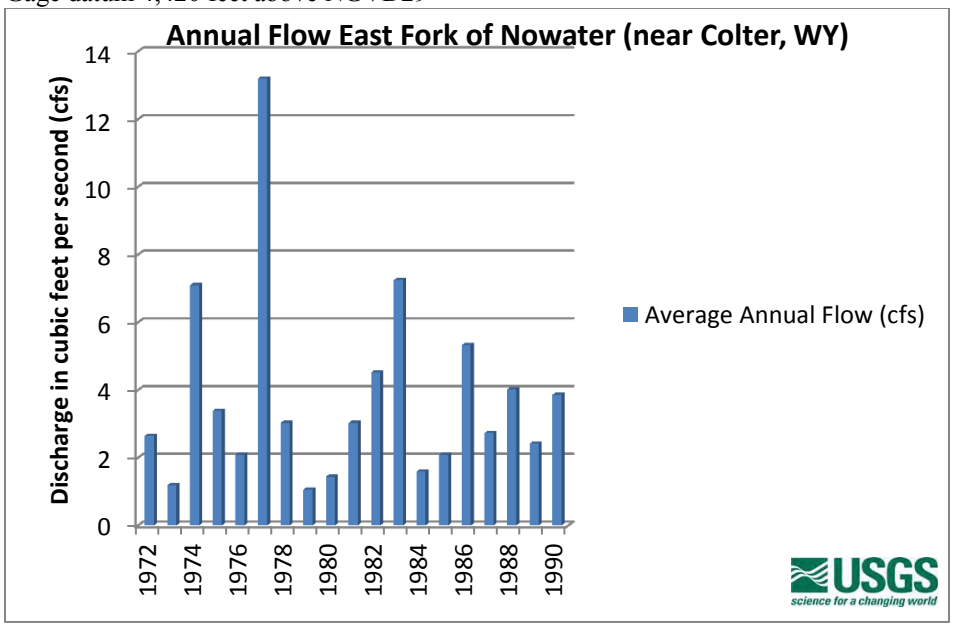
The average peak flows ranged from 160 cfs in 1980 to 3,040 in 1978. The annual discharge average for this period of record ranged from 1.19 cfs in 1974 to 13.2 cfs in 1978. This includes flow for the East Fork of Nowater and Denver Jake level 6 watersheds.







Description: USGS Site 06267260
Washakie County, Wyoming
Hydrologic Unit Code 10080007
Latitude 43°56'45", Longitude 107°48'37" NAD27
Drainage area 3.77 square miles
Gage datum 4,420 feet above NGVD29



BLM- Range Hydrologic Condition- The current conditions of runoff specific to the allotment are tied to the upland health hydrologic indicators. The overall hydrologic indicators measured for these 2 monitoring sites of the monitoring sights were slight to moderate at one site, and a moderate overall departure from reference conditions at the final site. Low amounts of infiltration and high amount of water flow patterns in the form of pedestals and terracettes with active shift in plant community and low soil surface resistance to erosion were noted to have a moderate and moderate to extreme departure at the TeePee Pole Pasture Transect 2. Although semi-arid ecological

sites naturally have these features, they were expressed beyond normal reference conditions and rated accordingly as moderate. All of the others hydrologic ratings are given in the Indicators Table.

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. 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 main channel of East Fork of Nowater Creek is relatively stable, with sporadic horizontal erosion occurring following high flow events, within a Rosgen C channel type.

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 nearest population center is Worland Wyoming that is located 20 miles to the west of the allotment. There are cattle and sheep grazing that occurs throughout the watershed and is discussed in greater detail in other sections of this document. There are numerous historic prospecting wells (oil and gas), active and abandoned wells that were drilled throughout 1950's- through 1970's. Human activities have created demand for existing roads in the watershed. The majority of the reservoirs were constructed from the 1950's-1970 and these impoundments have altered the runoff volume and sediment transmission rates from impounded drainages.

There are 29.2 miles of two track and miles of BLM improved roads. From the miles of road, the total disturbance was 53.1 acres. This was derived from digitized roads using a 30 foot width for improved roads and 15 foot width for primitive roads.

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 as indicated in the Wyoming Climate Atlas is 30 inches per year for the Worland area. This exceeds the annual precipitation of 7-9 inches per year, and therefore the amount of groundwater recharge into the primary Willwood and Fort Union aquifers from upland areas in the areas is minimal. The majority of local rainfall events generate surface water runoff and minimal ground water recharge. The shallowest available groundwater is found along the floodplains of East Fork Nowater and Sand Creek. The sand material in the channel and hydrologic B type soils provide for increased groundwater recharge in floodplain areas. There is one no major water well, (Sunburst Well) that historically produced 40 gallons per minute (gpm) within the allotment. The average annual depth to groundwater for the allotment is found on the map in section 2.4.2. This depth supports Cottonwoods (*Populus spp.)*, Rabbitbrush *Chrysothamnus nauseosus)*, and sporadic Sandbar (*salix exigua*)Willow species.

There are 8 water wells in the allotment. The shallow wells are completed in Quaternary and\or Willwood and Fort Union Formations; the deeper wells (historic oil) are completed in various aquifers at greater depths.

WELL NAME	TWN	RNG	SEC	USE	WELL DEPTH	STATIC DEPTH	YLD (gpm)
SUNBURST WELL	45	90	5	MIS	1130	0	40
W-T DRIVEWAY WELL	45	90	23				
HAWKS NEST WELL	45	90	14	STO	170	-1	5
SOHIO WELL	45	90	9	STO	250	1	10
K SPRATT WELL	46	90	32	STO	80	12	10
SPRATT WATER STORGAE WELL	46	90	20	STO	138		10
DAVIS WELL	46	90	35	STO	100	0	10
LYMAN WELL	46	90	34	STO			

3.3.3 Water Quality

BLM Observations:
The tributaries contain some active head-cuts that appear to be migrating upstream. 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. The East Fork Nowater Creek is not on the WYDEQ 2012 305b as impaired. The most recent TMDL performed by the WYDEQ has Nowater Creek impaired E. Coli for Primary Contact recreation from the confluence upstream 6.6 miles and is outside and downstream of the allotment. The contribution of water quality from upstream BLM sources is limited to storm water runoff events from ephemeral channels.

3.3.4 Riparian

The East Fork of Nowater was inventoried according to the BLM Manual 1737-15, for the Proper Functioning of Condition (PFC) of Lotic Riparian areas in 1994. This survey method was applied to ephemeral stream system, and an overall non-functioning rating was assigned to the whole segment due to the lack of herbaceous riparian understory. The following was taken from p.7 of BLM Manual 1737-15 *confusion over the distinction between intermittent and ephemeral streams may be minimized by applying Meinzer's (1923) suggestion that the term "intermittent" be arbitrarily restricted to streams that flow continuously for periods of at least 30 days and the term "ephemeral" be arbitrarily restricted to streams that do not flow continuously for at least 30 days. Intermittent or seasonal streams usually have visible vegetation or physical characteristics reflective of permanent water influence, such as the presence of cottonwood*. The overall potential of the system was compared to an intermittent stream segment without analyzing the flow regime and flow duration data from the USGS gauge. Subsequent BLM guidance suggested that ephemeral systems did not meet the intent to be assessed for PFC and other monitoring and assessment methods.

The system is a considered a losing segment with surface water that is lost to ground water throughout the reach with the permanent water table located below the surface throughout the year. During the traditional base flow months of August through February there is little to no surface water available.

3.4 Upland Vegetation

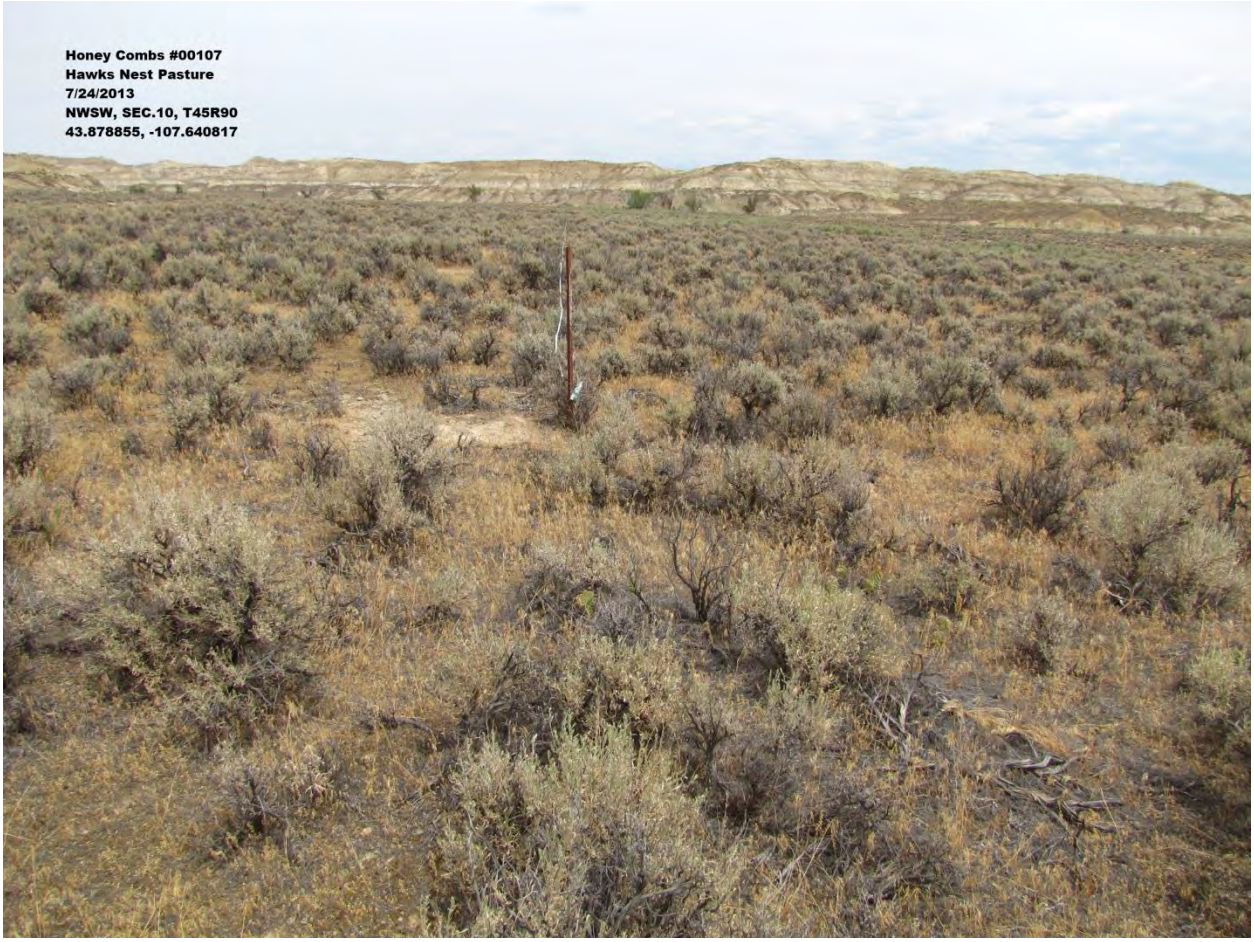
Data from the line intercept cover transects, the 17 Indicators of Rangeland Health, and other field observations were used to evaluate the vegetative community on the allotment. Standard 3 for Healthy Rangelands was evaluated based on the attribute ratings for Biotic Integrity using rangeland health indicators 8 through 9, and 11 through 17. Line intercept cover transects (approximately 100 points per transect) were completed in each monitoring site. A summary of the cover data collected from each monitoring site is shown in the table below:

Vegetation Monitoring Data						
Monitoring Site	**Ecological Site**	**Basal Vegetative Cover**	**Interspace Litter**	**Bare Ground**	**Sagebrush Canopy Cover**	**Brte presence ((hits/transect pts)*100)**
CABIN PRONG SEC18_SWSE	Loamy 5-9”	13	22	13	22	6
CABIN PRONG SEC21_NESE	Loamy 5-9”	12	28	16	27	12
HAWKS NEST SEC7_SENE	Loamy 5-9”	14	9	19	21	1
HAWKS NEST SEC10_NWSW	Loamy 5-9”	5	26	11	17	9
TEEPEE POLE SEC2_SWSW	Shallow Loamy 5-9”	6	11	24	9	12

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.

TEEPEEPOLE_SEC2_SWSW Assessment Site: The dominant functional / structural groups at this monitoring site was 17% cheatgrass, *Bromus Tectorum,*and annual forbs*,* followed by shrubs, followed by plains pricklypear and then then traces of mid stature grasses, mainly Sandberg bluegrass *Poa secunda*. No desirable perennial cool-season bunchgrasses were present in on the site. All plants exhibited good annual production and reproductive capability.

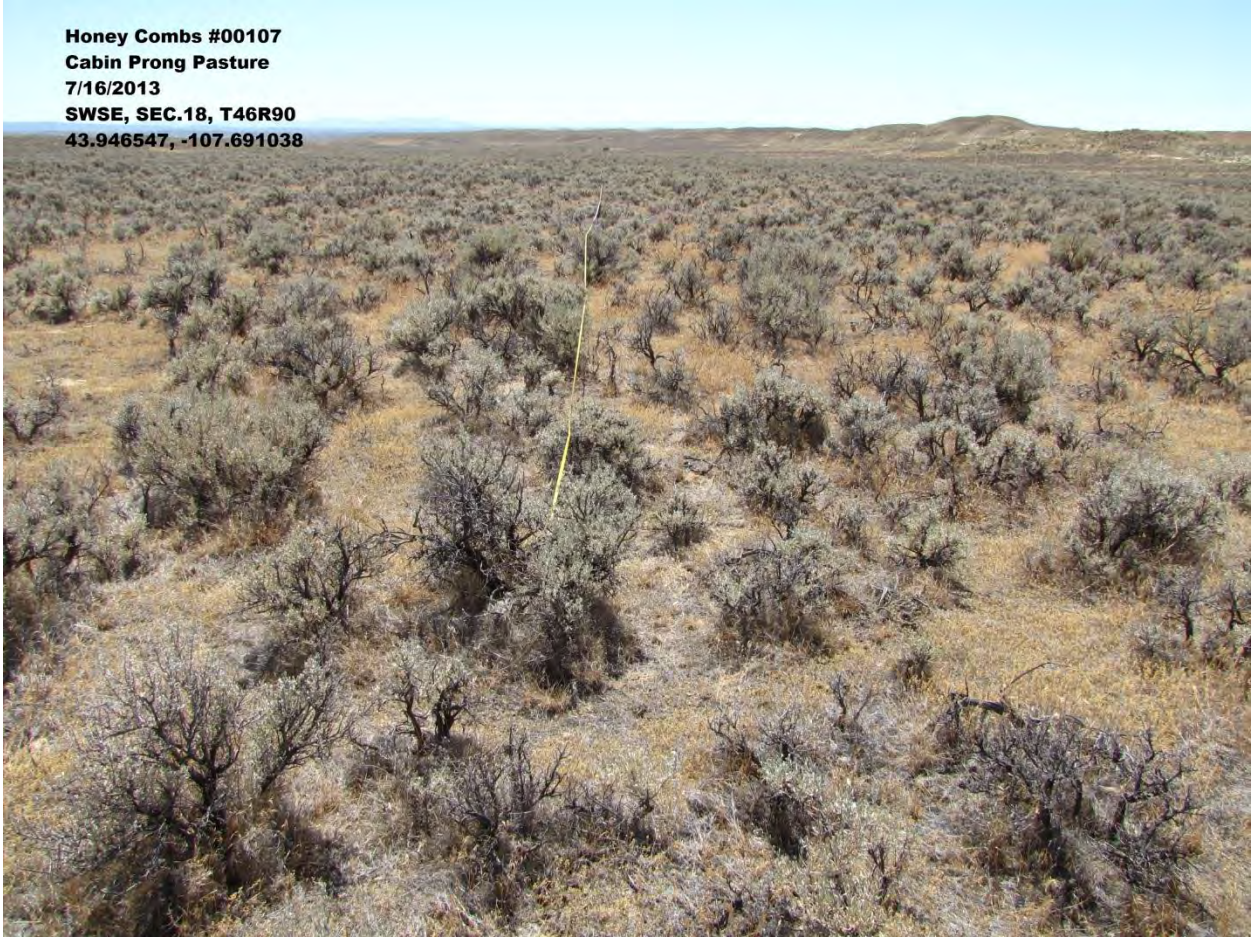
HAWKSNEST_SEC10_NWSW Assessment Site: The dominant functional / structural groups at this monitoring site was 21% cheatgrass, *Bromus Tectorum,* sixweeks fescue *Vulpia octoflora* and annual forbs; followed Shrubs, followed by plains pricklypear and then traces of mid stature grasses No decadence on sagebrush was observed. Annual production and reproductive capability was estimated to be as expected for the site.



Additional Allotment Observations

Additional monitoring areas

Not every ecological site on the allotment was intensively monitored. The sites selected for monitoring were determined to be representative of the overall condition of the upland sites within the allotment. Field observations indicate that the majority of the drainage bottoms and first level terraces above the drainage bottoms are dominated by understories of cheatgrass and annual forbs, with scattered sagebrush and greasewood. For this reason, intensive monitoring was not conducted on these sites.



Badlands/Shale-Rock Outcrop

The badland areas located at the head of the East Fork of the Nowater Watershed make up 67% of the Honey Combs allotment. Due to the low or nonexistent vegetation potential of these sites they were not evaluated or assessed in detail. These sites are ambiguous and technically do not fall under any specific ESD. The sites are made up of ridges and slopes greater than 20 percent with numerous dendritic drainage ways and escarpments dissecting them. As stated in the soils section 2.3, these sites fall under hydrologic group D soils which have a high runoff and erosion levels causing the absents of organic soil horizons. The soils group has low water holding capacity and high levels of salinity and alkalinity limit seedling success rates and general plant productivity. In addition, a nearly impervious layer limits plants' rooting depth to only 4-10 inches preventing many desirable native plants from successfully establishing or reaching full growth potential. These Badland areas were excluded from both evaluation and acreage calculations for all the Rangeland Health Standards.

Analysis

All of the monitoring/Assessment sites listed in the table above showed consistent attributes in vegetative composition and cover. According to the Ecological Site Descriptions locally developed by the NRCS, the Historic Climax Plant Community for these ecological sites is a *Bluebunch Wheatgrass/Rhizomatous Wheatgrass Plant Community*. This plant community is dominated by cool-season grasses, with a variety of forbs and woody species. Over time, with moderate, continuous season-long grazing, and/or prolonged drought, the plant community can transition to a *Perennial Grass/Big Sagebrush Plant Community*. In this plant community, the sites are still dominated largely by cool-season grasses, but short statured warm-season grasses and forbs are more common, and big sagebrush is more prevalent.

With frequent and severe grazing, and protection from fire, the preferred cool-season grasses can be significantly reduced or eliminated, transitioning the site to a *Big Sagebrush/Bare Ground Plant Community*. Weedy annual species such as cheatgrass may occupy the site if a seed source is available. If fire is present to remove the sagebrush, the site can transition to a *Blue Grama Sod Plant Community*. In areas with more saline soils, the plant

community can transition to a *Salt Tolerant Shrub/Rhizomatous Wheatgrass Plant Community* or a *Salt Tolerant Shrub/Bare Ground Plant Community*.

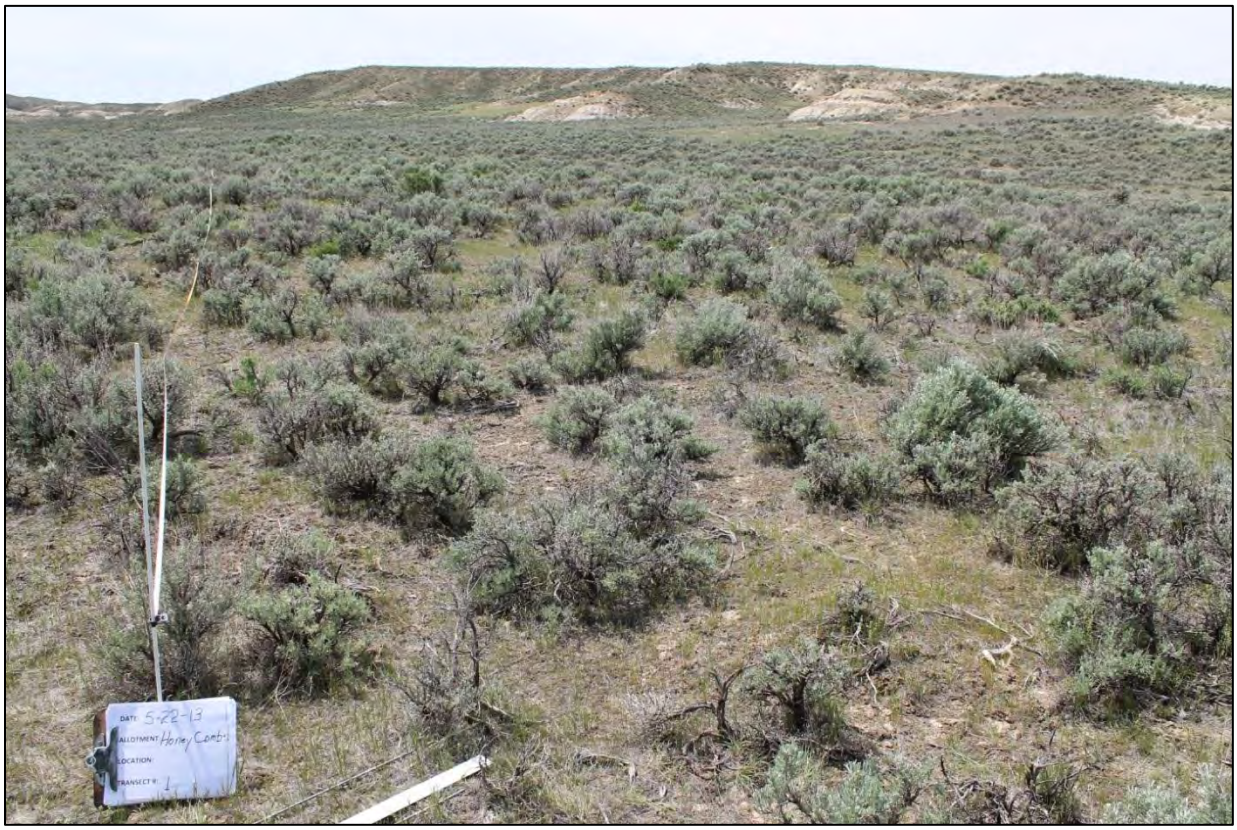
Ideally, these sites would be dominated by cool season mid stature grasses, followed by shrubs, forbs, and short stature grasses. The plant community observed at all three monitoring sites deviated from that specified in the reference sheet, in terms of the functional / structural groups present, and the presence of invasive plants (cheatgrass). At each monitoring site, shrubs were the dominant plant species. Short and mid stature cool season grasses were reduced in abundance, although the species present exhibited good vigor and seed production. Cheatgrass was present in varying amounts, at all the assessment sites. Due to the time of year that monitoring took place, very few forbs were documented. Most forbs are usually dried up and un-recognizable by mid to late summer.

The sites monitored on the Honey Combs Allotment do not 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 Honey Combs Allotment was rated as a “Moderate” departure on the or “Slight to Moderate” departure for the Loamy sites.

3.5 Wildlife Habitat

A sage grouse habitat assessment transect representative of the sage grouse habitat on the allotment was conducted during the growing season of 2013 to determine and record the canopy cover, brush height, and vegetation components of the sage grouse habitat on the allotment. Live sage brush canopy cover was determined to be 11 percent at the transect point, and sage brush height averaged approximately 14.4 inches. Belt transect surveys determined the mature sage brush component to 44 percent, indicating viable sage brush growth appropriate for this habitat and annual 5” to 9” precipitation zone.

Sage-grouse Habitat Transect #1					
Date: 5/22/2013 Observers: Ken Stinson, Jim Andersen Allotment Name: Honey Combs Allotment Location: LAT/LONG N. 43*53.844 W. 107*59.601					
Line Intercept Canopy Cover					
Species	**% Cover**				
Live Big Sagebrush	11%				
Dead Big Sagebrush	3%				
Other SPP: (Greasewood)	1%				
Other SPP: (Bud Sage)	9%				
Shrub Species	**Average Height in inches**				
Live Big Sagebrush	14.4”				
Other SPP: (Greasewood)	5.0”				
Other SPP: (Bud Sage)	4.0”				
Belt Transect					
Species	**%Young**	**%Mature**	**%Decadent**	**%Dead**	
Big Sagebrush		44%	22%	34%	
Bud Sage		80%	20%		
Daubenmire Cover Class & Vegetation Height Data					
Vegetation Height	New Herbaceous Mean Ht: 2.6”		Residual Herbaceous Mean Ht: 1.4”		
Summary of Cover Class (%)	New Perennial Grasses: 5.5%	New Annual Herbaceous: 2.7%	Perennial Forb: 0 %	Residual Herbaceous: 4%	Other: %



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:

Given the landscape relationship and direct effects of the surrounding badland areas known as the Persayo-Rock outcrop association that, this standard is being met in the Honey Combs Allotment. The Badlands/Persayo-Rock outcrop association consists of 67% (19,292 acres) of the allotment. It is characteristically arid, with high runoff/erosion potential and non-existent vegetation cover for stabilization. Since the ecological sites that were assessed are positioned downslope to the badlands, it shows their resistance along with their capacity to continue to function with minimal change following runoff events.

While effects of degradation from the upslope surrounding badlands are evident on the assessment sites, the soils are stable and capable of supporting healthy plant communities.

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.

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.

Ecological Site	Ecological State	Standard 3	Acres
Loamy 5-9"	Perennial Grass/Big Sagebrush	MET	4,176
Loamy 5-9"	Big Sagebrush/Bare Ground	NOT MET	2,840
Saline Upland 5-9"	Gardner's Saltbush/Bare Ground	NOT MET	1,895
Saline Lowland 5-9"	Inland Saltgrass Sod	NOT MET	592
Shale/Rock Outcrop 5-9"	Badlands	NOT APPLICABLE	19,292
Water	Reservoir	NOT APPLICABLE	18
	TOTAL ACRES		**28,813**[1]

State and Private lands not counted. Washakie Resource Management Plan, Record of Decision – September 1988, Table C-1, p. 53 lists total acres for this allotment as 31,588.

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.

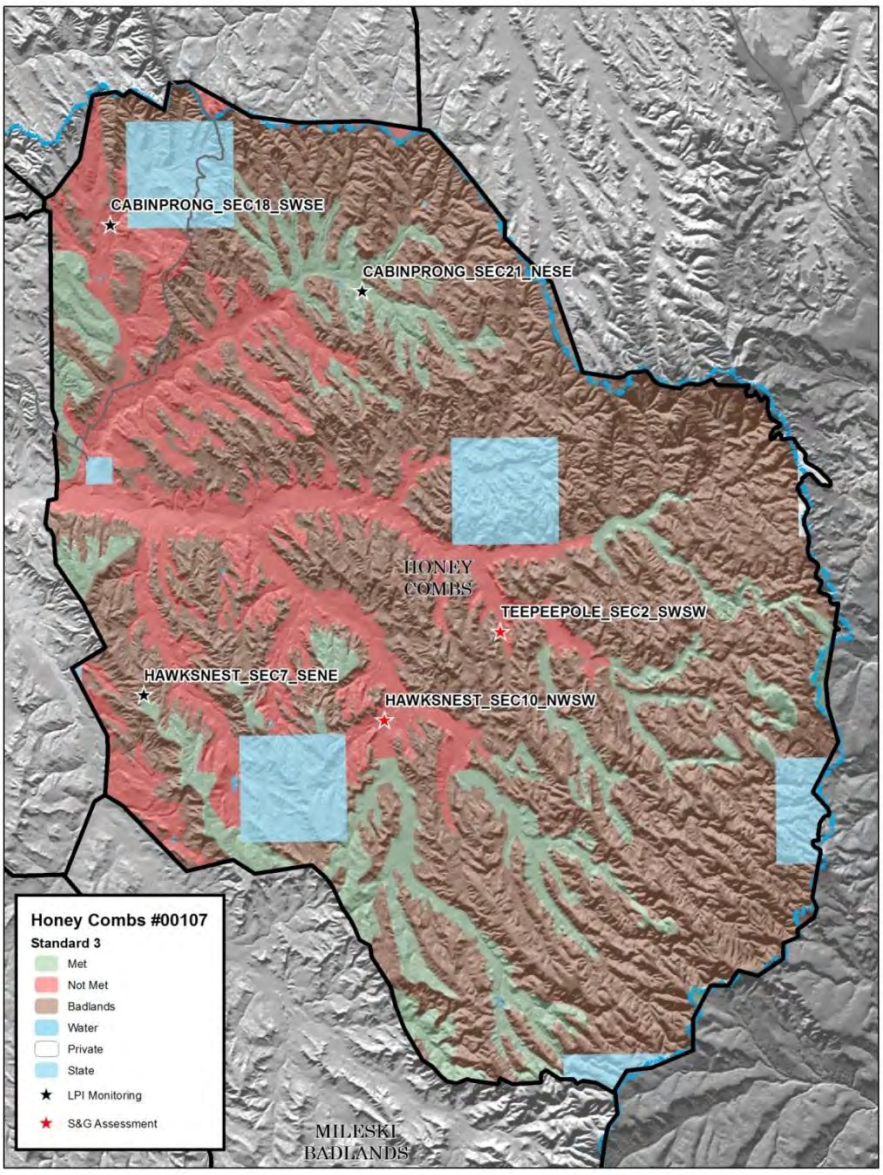
The acres that met standard 3 where mainly located in the far upper reaches of the drainages with considerable distance to reliable water sources, or areas on broad benches/flats above the drainages and draws or the steep ridges of the allotment that receive little or no disturbance.

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.

The current livestock management is not in conformance with the BLM Wyoming Guidelines. This conclusion is based upon the fact that data gathered at the key areas indicates that objectives are not being reached and in some cases the indicators show a decline in range condition and a shift from HCPC. While these key areas are in areas that are still meeting the standard there is evidence suggesting that under the current management the range conditions or attributes of range condition (frequency and % composition of key species) is not desirable. Billing records indicate that historic and present day use has been use has been over the prescribed NRCS continuous season long stocking rate. Even though the grazing use has steadily decreased over the past 30 years the allotment is still not properly stocked when factoring out the badland areas that cannot support livestock grazing. The allotment's 1971 AMP did have the allotment on a three pasture rotation however there is no data that the AMP rotation schedule was followed. Even with a three pasture rotation the repeated critical growing season use has resulted in range conditions in decline. The management that has occurred on the allotment is season long-grazing begins in the critical growing season and continues to dormancy-there is no rest (recovery) period for desirable species under the current management. While some of the failing acres like those immediate to water and in the multiple drainages/draws of the allotment are or could be attributed to historic grazing, the repeated critical growing season use continues to contribute to the standard not being met.

When the three pastures and badland acres that are unsuitable for grazing are taken in account; large limitations are put on the allotment's stocking rate and indicate that past grazing use has been over the prescribed NRCS continuous season long stocking rate of .10 AUMs/Acre.. The table below breaks out the acres of each pasture along with the percent of acres that are considered badlands/unsuitable for livestock grazing. For the sake of example, the averaged billed AUMs and AUM/Acres were calculated for each pasture even though in reality just one pasture was used per season.

Pasture	Total Acres	Percent Unsuitable	Suitable Acres	Avg. Billed AUMs			AUM/Acre (suitable)		
				1984-1993	1994-2003	2004-2013	1984-1993	1994-2003	2004-2013
Cabin Prong	8,300	60%	3295	1040	840	463	0.31	0.51	0.14
TeePee Pole	15,523	81%	2966						
Hawks Nest	7,424	47%	3928						



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.

RATIONALE -MET: The acres that met standard 4 match that of the acres that met in Standard 3; areas that are located in the far upper reaches of the drainages or areas on broad benches/flats above the drainages and draws or the steep ridges of the allotment.

These areas contain viable sage brush-steppe rangeland capable of sustaining wildlife populations and a diversity of native plant and animal species appropriate to the habitat and precipitation characteristics of the allotment. Year-long use by antelope and mule deer, and well as numerous raptors and predators indicates use of the habitat by numerous wildlife species, showing that these areas within the allotment are providing adequate cover, protection, and forage for sustainable and diverse populations of native plants and animal species appropriate to the allotment, even if it is less than optimal for sage grouse.

RATIONALE -NOT MET: The locations, where the 17 Indicators of Rangeland Health were assessed, were more representative of the allotment in general. Some level of sage-grouse wintering is occurring throughout the allotment where sagebrush densities are suitable, and a low amount of wintering sign was observed throughout the allotment at all transect locations. Sagebrush canopy cover within sagebrush stands used for sage-grouse nesting generally ranges from 15 to 25%, and winter habitat is generally defined as sagebrush stands with 10-30% canopy cover (Connelly et al. 2000a). Sage-grouse nesting or brood rearing have not been documented in this allotment, but as mentioned above, because of the proximity of occupied leks in neighboring allotments, is likely occurring at some level within the more suitable sagebrush habitats, but would not be anticipated at significant levels, primarily because nesting habitat conditions are marginal with low frequency of cool season bunch grasses and high frequency of invasive plants, (see Section 3.4). In a study conducted in south-central Wyoming, Kirol et al. (2012) found that selection of microhabitat for nests was negatively correlated with cheatgrass, and Coates/Lockyer et al. (2011) in a similar study in Nevada found that adult females selected for perennial grasses while avoiding annual grasses at the nest site.

These assessment sites deviate from the potential with moderate-extreme (M-E) departure for plant community composition and distribution (Indicator 10), functional / structural groups (Indicator 12), and invasive plants (Indicator 16), (see Table in Section 3.0. Rangeland Health Indicators). Because of these moderate to moderate-extreme deviations from site potential for indicators #10, #12 and #16 the sites are not meeting this standard. These rangelands or habitats evaluated here are likely not providing adequate amounts of wildlife forage and cover, and not capable of sustaining viable and diverse populations of native plants, and therefore animal species also. Particularly those species dependent on sagebrush communities like mule deer and antelope as well as sage-grouse. From a wildlife habitat perspective the shallow loamy sites mentioned above with moderate deviations are lacking key plant species, or adequate amounts of these plant species necessary for the seasonal life cycle demands. And also because of the prevalence of invasive species like cheatgrass, these shallow loamy sagebrush sites are at higher risk of more frequent wildfire occurrence and subsequent frequency increases in invasive species and sagebrush frequency decreases. For these sagebrush dependent species mentioned above, frequency and composition of sagebrush and key bunchgrass species are particularly important for forage, cover and nest concealment, as well as for the long term maintenance and health of the sagebrush community itself.

4.5 Standard 5

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

Rationale:
No information is currently available to indicate that this Standard is or is not being met. There are no major drainages of significant size to be listed in the WYDEQ 2012 report.

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.

5.0 Resource Specialist Signatures

X _____

Michael Peck
Rangeland Management Specialist

X _____

John Elliott
Supervisory Rangeland Management Specialist

X _____

Ted Igleheart
Wildlife Biologist

X _____

Jared Dalebout
Hydrologist

X _____

Michael J. Phillips
Assistant Field Manager - Resources

X _____

Other_____

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 guidelines.***

X _____

Rebecca Good
Worland Field Office Manager

Date:_____

7.0 REFERENCES

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