U.S. Department of the Interior
Bureau of Land Management

Management Evaluation Report

North Red Desert Complex

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PREPARING OFFICE

U.S. Department of the Interior
Bureau of Land Management
Lander Field Office

North Red Desert Complex Herd Management Area Plan
Management Evaluation

Contents

INTRODUCTION

The Red Desert Complex includes the Antelope Hills, Crooks Mountain, Green Mountain, Stewart Creek, and Lost Creek Herd Management Areas (HMAs) The complex lies south and west of Highway 789/287 and north of interstate 80. The complex is located within portions of Fremont, Sweetwater, Natrona, and Carbon counties and lies within the Wind River Bighorn Basin and High Desert Bureau of Land Management Districts. The complex is approximately 753,000 acres. These HMAs are considered a complex since the HMAs are adjacent, but not necessarily contiguous, and have animal interchange. For practical purposes these HMAs are often gathered at the same time.

The northern and southern portions of the Red Desert complex are being evaluated independently by the respective field offices that oversee their management. These management evaluations are the first step in the creation of a Herd Management Area Plan or HMAP. A management evaluation examines the existing vs. the desired condition of both the wild horse population and its habitat. This document will focus on the Antelope Hills, Crooks Mountain, and Green Mountain HMAs located in the northern portion of the complex and administered by the Lander FO. For the purposes of this document, we will refer to these HMAs as the North Red Desert Complex. The Rawlins field office will evaluate the southern portion of the complex including the Stewart Creek and Lost Creek HMAs which will be referred to as the South Red Desert Complex for the purposes of their management evaluation. Both the North and South Red Desert Complex management evaluations will be released to the public to provide a framework for public comment regarding a management plan (HMAP) to guide future management of the herds within the Red Desert complex.

The terms “horse” and “wild horse” are used synonymously throughout this document.

The North Red Desert Complex is characterized by gently rolling hills of grass-sagebrush to steep mountainous terrain around Green Mountain and Crooks Mountain with lodgepole, juniper, and limber pine forest at higher elevations. In Antelope Hills there are abrupt rocky zones interspaced with rolling sagebrush grasslands and alkaline flats with areas of greasewood and small sand dunes. Annual precipitation ranges from 5 to 7 inches per year at the lower elevations to15-20 inches for the upper elevations on Green Mountain and Crooks Mountain, most of which is received in the form of winter snows and spring snow/rain. Summers tend to be dry. Temperatures range from greater than 90 degrees Fahrenheit in the summer months to minus 15 degrees or colder in the mountains in the winter. Elevations range from approximately 6,200 feet to over 9,200 feet.

RELATIONSHIP TO STATUTES, REGULATIONS, POLICIES, OR PLANS

The current Resource Management Plan (RMP), laws, regulations, and policies, as outlined below, set forth management goals and objectives and reaffirm Appropriate Management Level (AML) for the Herd Management Areas (HMAs) and within the complex.

2014 Lander RMP:

- **Goal:** Manage healthy wild horse herds within appropriate management levels that will maintain a thriving natural ecological balance between wild horse populations, wildlife, livestock, vegetation resources, and other resource values.
- **Objective:** Adjust and maintain wild horse numbers and HMAs to comply with federal policies and applicable agreements with the State of Wyoming, as applicable to the management situation.
- **Objective**: Maintain or enhance herd viability, genetic integrity, and unique characteristics that distinguish individual herds.
- **Objective:** Provide opportunities for viewing wild horses.
- **Management Decision:**
    - Conduct regular and periodic gathers when necessary to maintain a thriving natural ecological balance or when required by emergency to maintain the initial Appropriate Management Level ranges (number of horses) listed below. See table 1.
    - Utilize chemical and other population control measures as needed to maintain Appropriate Management Level ranges.
    - Gather wild horses outside the established Herd Management Areas during routine periodic gathers (Map 27 of the Lander RMP). Prioritize gathers in greater sage-grouse Core Area unless removals are necessary in other areas to prevent serious environmental issues, including herd health impacts. Utilize Required Design Features and techniques such as those in Appendix L (p. 313) of the Lander RMP, to promote genetic diversity and limit adverse impacts to wild horses from gathers.
    - Employ selective removal criteria during periodic gathers to increase desired genotype and phenotype.
    - Utilize monitoring and evaluation data to assess habitat and populations within Herd Management Areas.
    - Conduct animal health monitoring.
    - Maintain sufficient year-round water sources to sustain wild horses. Evaluate all proposed range improvement projects to benefit wild horses for impacts to other resources and uses.
    - Update the Herd Area Management Plan as needed to meet herd health objectives, including Appropriate Management Levels, and to address impacts to other resources. Consider forage competition and evaluate overall utilization levels by all grazing animals, and incorporate greater sage-grouse habitat management objectives.

Federal Land Policy and Management Act of 1976 (FLPMA):

FLPMA generally requires that an action under consideration be in conformance with the applicable BLM land use plan(s), and be consistent with other federal, state, and local laws and policies to the maximum extent possible.

Wild Free-Roaming Horses and Burros Act (WFRHBA)

The statute requires the BLM to protect the range from deterioration associated with overpopulation (16 U.S.C. § 1333(b)(2)) and defines excess animals as wild and free-roaming horses and burros that must be removed from an area in order in order to preserve and maintain a thriving natural ecological balance and multiple-use relationship in that area (16 U.S.C. § 1332(f)). It also directs the BLM to maintain a current inventory of wild free-roaming horses and burros on public lands. The purpose of the inventory shall be to: make determinations as to whether and where an overpopulation exists and whether action should be taken to remove excess animals; determine appropriate management levels or wild free-roaming horses and burros on these areas of public land; and determine whether appropriate managements should be achieved by the removal or destruction of excess animals, or other options (such as sterilization, or natural control on population levels) (16 U.S.C. § 1333(b)(1)).

BLM Regulations at 43 C.F.R. Part 4700

- 43 C.F.R. § 4700.0-6 (a): Wild horses shall be managed as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat (emphasis added).
- 43 C.F.R. § 4710.4: Management of wild horses and burros shall be undertaken with the objective of limiting the animals' distribution to herd areas. Management shall be at the minimum level necessary to attain the objectives identified in approved land use plans and herd management area plans.
- 43 C.F.R. § 4720.1: Upon examination of current information and a determination by the authorized officer that an excess of wild horses or burros exists, the authorized officer shall remove the excess animals immediately…
- 43 C.F.R. § 4720.2: Upon written request from a private landowner……the Authorized Officer shall remove stray wild horses and burros from private lands as soon as practicable.
- 43 C.F.R. § 4740.1(a): Motor vehicles and aircraft may be used by the authorized officer in all phases of the administration of the Act, except that no motor vehicle or aircraft, other than helicopters, shall be used for the purpose of herding or chasing wild horses or burros for capture or destruction. All such use shall be conducted in a humane manner. (b) Before using helicopters or motor vehicles in the management of wild horses or burros, the authorized officer shall conduct a public hearing in the area where such use is to be made.

EXISTING CONDITIONS

Wild Horses

Wild horses can be found throughout the North Red Desert Complex at different times of the year. In the Green and Crooks Mountain HMAs horses tend to use higher elevations during the summer and move to lower elevations in the winter. In Antelope Hills bands of horses move throughout the HMA without following a set pattern. In deep snow years they typically move south and east, but bands can be found throughout the HMA during almost every season. Vegetation in all three HMAs is similar, with horses existing primarily on grasses such as Sandberg bluegrass (*Poa Secunda*), Needle-and-thread grass (*hesperostipia comata*), Indian ricegrass (*Achnatherum hymenodes*), and various other grass species to a lesser extent. In

addition to grasses, shrubs such as Wyoming Big Sagebrush (*Artemisia tridentata wyomingensis*), yellow rabbitbrush (Chrysothamnus visidiflorus), and winterfat (*Krascheninnikovia lanata*), are abundant and may be utilized to a limited degree as forage especially in heavy snow years. Water in the complex comes mostly from natural sources including seeps, springs, creeks and ponds/reservoirs both natural and manmade, but there are a few wells and/or pipelines in each HMA. Most foals in the complex are born between the first of March and the end of June.

The definition of Appropriate Management Level (AML) (BLM 2010b) is the population range within which wild horses and burros (WH&B) can be managed for the long term. The AML upper limit is established as the maximum number of wild horses which results in a thriving natural ecological balance (TNEB) and avoids a deterioration of the range. The North Red Desert Complex has an AML range of 295-467 wild horses. The current AMLs were established in 1993 & 1994 from a process that included 5 years of focused, intensive monitoring of wild horse herd areas, use areas and grazing allotments. Evaluation of data, public input, and environmental analysis were utilized to establish the appropriate management level (AML) of a herd. AML levels were established for the Lander Field Office (LFO) by two NEPA analyses. In 1993, EA# WY-036-EA3-010 Lander EA set the AML for Green Mountain and a Rawlins Field Office EA, EA# WY-037-EA4-122 identified two HMAs and AML levels for Crooks Mountain and Antelope Hills. These AML ranges were reaffirmed in the Approved Lander RMP (2014a) following an in-depth analysis of habitat suitability, resource monitoring, and population inventory data, with public involvement. Table 1 shows the AML for wild horses in the North Red Desert Complex by HMA.

The wild horse population in the North Red Desert complex as of March 1, 2026 was 1541 horses including those outside the HMA but within the whole Red Desert complex. After this year's foaling the population is expected to grow to an estimated 1849 horses. This exceeds the low AML by 1554 horses. Table 2 shows the population estimates since the last Red Desert complex gather in 2020. The accepted standard for annual population growth in wild horse herds is 20% annually. This can vary depending on the specific locality and weather conditions, but averaged over many years it is a good estimated growth rate for this complex. Foals aren't officially counted as part of the population until Mar. 1 of the year after their birth. This is a good standard for consistency, but it doesn't alter the fact that foals are part of the total population at any given time. This is noteworthy because summer and fall gather numbers usually don't match the population estimate given on March 1.

The winter of 2022-2023 produced above average snowfall and extreme winter conditions within the complex. These conditions caused high mortality for wild horses and wildlife within the complex. It also resulted in horses moving greater than normal distances in search of food. In many places fences were completely buried under densely drifted snow. This allowed horses to move greater distances without restriction. Table 2 shows a huge disparity between 2024 population estimates and the 2025 estimates. Following the 2022-23 winter the Lander FO BLM knew that there was high mortality and significant movement in its horse herds but was not able to census the complex until spring of 2025. With no better information to move forward with, the 2023 and 2024 population estimates carried forward the 2022 population with a 20% increase.

The 2025 survey refocused our population data and illustrated the changes in distribution resulting from the winter of 2022-23.

Wild horse social behaviors and space requirements cause bands of horses to seek new territory when the population in a given area gets too high. This natural behavior often results in wild horses leaving the HMA boundaries. A large component of establishing the AML for all the HMAs in the Red Desert complex, including horses in both field offices, was the number of horses a HMA could handle before horses started moving out (EA# WY-036-EA3-010 and EA# WY-037-EA4-122). Table 2 shows 264 horses outside the HMA based on the 2025 census. The majority of these horses can be found in the geographic area between the 5 HMAs in the complex commonly referred to as the "donut hole" (see Map 1). In addition to these horses there are areas of fenced private ground within each of these HMAs that have been repeatedly breeched by wild horses seeking space and new territory. In the past few years horse populations within the complex have climbed beyond the AML. This increasing population has resulted in a corresponding increase in horses seeking new territory as demonstrated by more frequent conflicts with private landowners and permittees in areas where wild horses are not supposed to be. The BLM has removed or attempted to remove horses from these areas with increased frequency and reduced effectiveness as the population has grown. In many cases simply moving wild horses back into the HMA and/or off private property is ineffective if there is an excess of wild horses, because the need for food, water, and space is unchanged. When such an excess exists wild horse gathers and removals are typically the only effective way to correct the problem.

The most recent gathers in this complex include a 2018 gather of the Green Mountain and Stewart Creek HMAs and a 2020 gather of Stewart Creek, Lost Creek, Antelope Hills, Crooks Mountain, and Green Mountain HMAs as well as areas outside the HMAs (see Table 3).

Tables 1 and 2 show the current approximate HMA acreage, AML range, wild horse populations, and wild horse use within the North Red Desert complex.

Table 1: North Red Desert Complex Characteristics

Herd Management Area	Total Acres Private/Public Land	AML Range Low/High	Current Population Estimate (Includes 2026 Foal Crop)	Estimated Wild Horse Use (AUMs)
Antelope Hills	158,567	60/82	508	6096
Crooks Mountain	58,415	65/85	217	2604
Green Mountain	116,712	170/300	860	10320
Outside HMA	NA	0	264	3168
Total	333,694	295/467	1849	22188

Table 2: North Red Desert Complex Population Estimates (2020-2027)

HMA	Antelope Hills	Crooks Mtn	Green Mtn	Outside HMA	Total
	Pop. Est.	Pop. Est.	Pop. Est.	Pop. Est.	
2020*	437	232	337	962	1968
2021	60	65	327	449	901
2022	72	78	392	539	1081
2023	86	94	471	647	1298
2024	103	113	565	776	1557
2025**	353	151	597	183	1284
2026	424	181	716	220	1541
2027	508	217	860	264	1849

* This is the pre-gather population based on August 2020 census flights. All other numbers are as of March 1 and are calculated based on post gather/removal or census numbers.
** 2025 an infrared census was completed Feb./Mar. of this year. This accounts for the change between 2024 and 2025.

Table 3 shows recent gather, removal, and fertility control treatment numbers by HMA.

Table 3: Red Desert Complex 2018 and 2020 gather data

HMA	Total Gather	Released	Fertility Control Treatments
2018			
Green Mountain	1107	25	12
Stewart Creek	340	0	0
Total	**1447**	**25**	**12**
2020			
Antelope Hills	574	35	16
Crooks Mountain	186	40	20
Green Mountain	52	9	5
Stewart Creek	447	90	46
Lost Creek	485	25	13
Outside HMA	224	0	0
Total	**1968**	**199**	**100**

Genetic Diversity

A component of the 2018 and 2020 Red Desert gathers was collection of hair follicle samples for genetic testing. The methodology described in the gather EA (DOI-BLM-WY-030-EA15-63) included testing individuals as well as each HMA collectively. The goal was to identify

individuals with the New World Iberian genotype so that they could be compared to their photos and a phenotype could be identified. In accordance with the EA samples were submitted to Texas A&M university with specific instructions to analyze individual horses as well as individual HMAs within the complex. The analysis the BLM received includes an assessment of each HMA and the complex as a whole but does not look at individual horses as initially requested. Unfortunately, this omission was discovered too late to rectify. At the herd and complex level, the analysis failed to show a strong link to the New World Iberian genotype. Highest mean genetic similarity at the complex level was with the Light Racing and Riding breeds and the North American Gaited Breeds. The complete analysis can be found on BLMs ePlanning page (Red Desert Complex Herd Management Area Plan & Wild Horse Gather)

The author's brief summary and recommendations follow below:

Summary and Recommendations: Current genetic variability levels of this herd complex is good. The variation results suggest that this is a single, interbreeding herd overall, but that there could be some limited population subdivision. This, if true and maintained, could be beneficial to long term maintenance of genetic diversity. The herd appears to be primarily of mixed breed ancestry.

Current variability levels are high enough that no action is needed at this point and the apparent genetic stability suggest that recent management strategies are working well to maintain diversity.

Other Resource Uses

Livestock Grazing

The HMAs in the North Red Desert Complex are located within the boundaries of grazing allotments permitted for cattle and sheep use for portions of the year. Permitted livestock grazing use has been reduced from historical grazing levels over the past decades in each of the allotments. This has been in part due to BLM reductions to grazing authorizations, competition with wild horses for forage, and the needs of livestock operations. The BLM continues to evaluate allotments for achievement of rangeland health standards, and adjustments to livestock grazing are implemented as appropriate, as grazing term permits are renewed or through annual coordination between BLM and grazing permit holders. Livestock grazing is administered through the regulations at 43 C.F.R. Part 4100 and must be consistent with multiple use allocations set forth in RMPs. Changes to livestock grazing cannot be made with a wild horse management decision.

Livestock grazing actual use of permitted use has averaged approximately 66% in the Antelope Hills HMA, 90% in the Crooks Mountain HMA, and 74% in the Green Mountain HMA since 2021[1]. **In Tables 4 through 6** Animal Unit Month (AUM) means the amount of forage necessary for the sustenance of one cow or its equivalent for a period of 1 month. 43 C.F.R. § 4100.0-5.

Table 4: Antelope Hills HMA Grazing Allotments

HMA	Allotment	Season of Use & Kind of Livestock	% of Allotment in HMA	Permitted Use in HMA[1] (AUM)	2021-2025 Average AUM Use in HMA	Percent Actual Use of Permitted Use
Antelope Hills	Antelope Hills	5/20-9/20 Cattle	51%	2,785	2,557	92%
Antelope Hills	Antelope Hills	5/1-10/1 Sheep	51%	1,481	1,078	73%
Antelope Hills	Arapahoe Creek	5/1-10/1 Cattle	< 1%	127	125	98%
Antelope Hills	Arapahoe Creek	11/1-3/31 Sheep	< 1%	23	11	46%
Antelope Hills	Cyclone Rim	Year-round Cattle	18%	2,799	1,507	54%
Antelope Hills	Cyclone Rim	4/15-5/1 Sheep	18%	2,113	878	42%

Table 5: Crooks Mountain HMA Grazing Allotments

HMA	Allotment	Season of Use & Kind of Livestock	% of Allotment in HMA	Permitted Use (AUM)	2021-2025 Average AUM Use	Percent Actual Use of Permitted Use
Crooks Mountain	Arapahoe Creek	5/1-10/1 Cattle	22%	2,804	2,749	98%
Crooks Mountain	Arapahoe Creek	11/1-3/31 Sheep	22%	513	235	46%
Crooks Mountain	Antelope Hills	5/20-9/20 Cattle	< 1%	55	50	92%
Crooks Mountain	Antelope Hills	5/1-10/1 Sheep	< 1%	29	21	73%
Crooks Mountain	Alkali Creek Sheep	4/1-4/30 10/2-10/31 Sheep	2%	21	15	71%

[1] Livestock AUMs in HMA are estimated as a proportion of the total area of each allotment overlapping with the HMA. This is only an estimate since the HMA boundaries are primarily unfenced and animal distribution is not proportional.

Table 6: Green Mountain HMA Grazing Allotments

HMA	Allotment	Season of Use & Kind of Livestock	% of Allotment in HMA	Permitted Use (AUM)	2021-2025 Average AUM Use	Percent Actual Use of Permitted Use
Green Mountain	Whiskey Peak	6/1-12/31 Cattle	100%	5,450	4,230	78%
Green Mountain	Whiskey Peak	6/15-11/30 Sheep	100%	2,294	1,147	50%
Green Mountain	Mountain	5/1-11/16 Cattle	100%	1,976	1,782	90%
Green Mountain	Arapahoe Creek	5/1-10/1 Cattle	2%	255	250	98%
Green Mountain	Arapahoe Creek	11/1-3/31 Sheep	2%	47	21	46%

Range Improvements

There are multiple springs, seeps, creeks, and water developments within the complex. Some provide water year-round and some are seasonal and weather dependent. Water sources used by wild horses are located on BLM, state, and private ground. In general, there is adequate water to supply wild horses year-round, but drought conditions and high horse numbers can cause high numbers of horses to concentrate at a few primary water sources especially late in the summer. High concentrations of wild horses negatively affect these primary water sources and riparian areas.

The BLM has completed fencing projects within the complex to control seasonal livestock grazing and to protect sensitive areas. Gates on most internal or pasture fences are opened after livestock are removed for the season to allow unimpeded migratory movement of wild horses and wildlife. Some riparian exclosures are opened to wild horses after the livestock grazing season, some remain closed year-round.

Mining

No active mining is occurring in these HMAs. Several inactive uranium mines in the Green Mountain HMA are likely to continue inactivity for the foreseeable future (Sheep Mountain Mine, Big Eagle Mine, Jackpot Mine). There are currently several active uranium exploration Notices within these HMAs that consist of drilling activities during the summer and fall months in the Cyclone Rim area (Antelope HMA) and North Hadsell Creek area (Green Mountain HMA). The nearby Lost Creek ISR Mine and Sweetwater Uranium Mill have ongoing operations outside of these HMAs resulting in increased traffic on area roads.

Oil and Gas

The Northern Red Desert complex contains only a small number of operational oil and gas wells, with just a single current Application for Permit to Drill (APD) on file. Active exploration in the region remains limited, and there are no major projects anticipated in the foreseeable future.

Given these modest levels of activity, the impact of oil and gas operations on wild horses in the area is minimal.

Recreation

Recreational uses within the complex include, but are not limited to, the Continental Divide National Scenic Trail, 4 national Historic Trails, off road vehicle use, camping, hunting, and wildlife and wild horse viewing.

Wildlife

The Complex consists of diverse vegetation communities providing habitat for a wide array of wildlife species. There is yearlong habitat for mule deer, pronghorn antelope, and Rocky Mountain elk throughout. A small population of moose lives on Green Mountain and may occasionally be seen in the other HMAs in the complex as well. Additionally, the complex has some component of big game crucial winter and summer seasonal habitats. Other major wildlife species throughout the complex include mountain lions, black bear, bobcats, badgers, coyotes, red fox, jack rabbits, cottontails and a variety of other bird species, small mammals, and reptiles.

The complex also provides habitat for numerous BLM Special Status Species. There is suitable habitat within the complex for a variety of BLM sensitive species, including swift fox, pygmy rabbit, Townsend's big-eared bat, white-tailed prairie dog, sage sparrow, burrowing owl, ferruginous hawk, loggerhead shrike, sage thrasher, and Brewer's sparrow. Greater sage-grouse is a BLM sensitive species with special management considerations. The complex is within greater sage-grouse Core Area and is year-round habitat for this BLM sensitive species.

Wildfire and Fuels

Fire history within the complexes is characterized by low occurrence and low severity. The largest fires within the complex were all within the Green Mountain HMA. The Sheep Park fire in 2012 burned 525 acres, the West Cotton fire in 1995 burned 400 acres, and the Stratton Fire in 1992 burned 1216 acres. There has been little to no fire activity in the Crooks Mountain and Antelope Hills HMAs during this same period; only a few minor ignitions that burned an acre or less. There is no evidence that any of the fires in the complex has substantially or permanently altered the vegetative community.

There have been numerous fuels projects on Green Mountain geared toward wildlife habitat improvement and fuels reduction. Prescribed fire, cutting and piling, and mulching have been used to promote aspen and willow growth, reduce limber pine and juniper encroachment, and reduce fuel load.

RANGE SOIL & VEGETATION CONDITIONS AND FORAGE UTILIZATION

Soils and Vegetation

The North Red Desert vegetation types consist of meadow, grass, sagebrush, mountain shrubs, conifer, and deciduous trees. Wyoming big sagebrush is the dominant shrub; however, understory species composition is varied and can be differentiated by slope, aspect, and soil properties. The major meadow plants consist of various sedges and rushes. Grass plants on the upland range communities consist of western wheatgrass, bluebunch wheatgrass, threadleaf sedge, prairie junegrass, and needle-and-thread grass.

The area contains diverse kinds of soils, from cold, sub-humid mountain soils to warm and cool, semiarid soils on dunes. Precipitation patterns directly impact soil resources. The bulk of annual precipitation occurs in the spring, typically beginning in late March, peaking in May, and finally declining rapidly in June. A minor but important second peak occurs during the fall period, September through November. This fall moisture can initiate a second period of growth for cool-season grasses, but more importantly, it will ensure a good frost seal for the soils. This pre-wetting seal allows for the deep permeation of spring precipitation into the soil profile for use by the more desirable, deeper-rooted native grasses and shrubs. Storing moisture deep in the soil profile will ensure its availability for later use.

Upland Soil & Vegetation Conditions

To evaluate current upland range conditions, we used terrestrial Assessment, Inventory, and Monitoring (AIM) data to understand current[2] plot-level conditions. From terrestrial AIM, the primary data used was from the line point intercept (LPI) protocol, which provides quantifiable information regarding soil cover, which is comprised of vegetation, litter, rocks, and biological crusts (Herrick et al. 2015). Secondary information ascertained from LPI data is plant composition. Ground cover is important to consider when evaluating site conditions as compared to the expected site reference conditions. Herrick et al. (2009) states that total foliar, litter, and other surface cover (rocks and biological crusts) are positively correlated with soil and site stability and hydrologic function. It protects the soil surface from raindrop impact, thereby limiting detachment of soil particles and physical crusting of the soil surface. Additionally, higher cover generally means there are more obstructions to water flow. We used data from 14 AIM plots for the Antelope Hills HMA, 4 from the Crooks Mountain HMA, and 9 from the Green Mountain HMA, which are described in Table 4.

[2] Data used was from 2022-2025

Table 7: North Red Desert Complex monitoring plots

HMA	Plot ID	Date visited	Ecological Site	Ecological Site Name	Latitude	Longitude
Green Mountain	LFO2022-019	2022-08-06	*unmapped*	*unmapped*	42.2616174	-108.2949103
Green Mountain	LFO2022-003	2022-08-06	*unmapped*	*unmapped*	42.2486311	-108.2462805
Green Mountain	LFO2022-051	2023-07-06	R034XY350WY	Sandy High Plains Southeast (Sy)	42.3383848	-108.5180422
Green Mountain	RFO2021-095	2023-06-07	*unmapped*	*unmapped*	42.1549680	-108.3857794
Green Mountain	LFO2022-105	2024-07-18	*unmapped*	*unmapped*	42.2511803	-108.4273854
Green Mountain	20235613101517B1	2023-09-09	R034AY350WY	Sandy High Plains Southeast (Sy)	42.3143035	-108.5110167
Green Mountain	20235613101517B2	2023-09-09	R034AY346WY	Sands High Plains Southeast (Sa)	42.3163205	-108.5162777
Green Mountain	20225637102418B2	2022-07-27	R034AY122WY	Loamy Green River and Great Divide Basins (Ly)	42.2088040	-108.3342262
Green Mountain	20225637102418B1	2022-07-27	R034AY150WY	Sandy Green River and Great Divide Basins (Sy)	42.2064383	-108.3420603
Antelope Hills	LFO2022-T-14	2022-08-05	R043BY308WY[3]	Coarse Upland (CU) 15-19" Foothills and Mountains East Precipitation Zone	42.3390559	-107.7564324
Antelope Hills	LFO2022-018	2022-08-03	R034AY146WY	Sands Green River and Great Divide Basins (Sy)	42.2823285	-107.6594480
Antelope Hills	LFO2022-T-13	2022-08-04	R034AY228WY	Lowland Foothills and Basins West (LL)	42.3268824	-107.7386065
Antelope Hills	LFO2022-T-20	2023-07-18	R034AY322WY	Loamy High Plains Southeast (Ly)	42.2887938	-107.6145920
Antelope Hills	LFO2022-061	2023-07-19	R034AB122WY	Loamy Green River Basin (Ly GRB)	42.3093888	-107.6089480
Antelope Hills	LFO2022-T-23	2023-07-19	R034AY350WY	Sandy High Plains Southeast (Sy)	42.2782841	-107.6463223
Antelope Hills	LFO2022-T-19	2023-07-20	R034AY358WY	Shallow Clayey High Plains Southeast (SwCy)	42.2945014	-107.5291740
Antelope Hills	LFO2022-T-21	2023-06-23	R034AY304WY	Clayey High Plains Southeast (Cy)	42.3881355	-107.5803618
Antelope Hills	LFO2022-089	2024-07-19	R034AY150WY	Sandy Green River and Great Divide Basins (Sy)	42.2687650	-107.6628382
Antelope Hills	LFO2024-T-07	2024-06-21	R034AY128WY	Lowland Green River and Great Divide Basins (LL)	42.4061743	-107.5168001

[3] AIM data identified this site as MLRA 049X, Southern Rocky Mountain Foothills. This MLRA is likely for this analysis area, therefore we compared this site to the more likely MLRA 043B, Central Rocky Mountains Coarse Upland ESD.

Antelope Hills	2023567102716B1	2023-08-31	R034AY150WY	Sandy Green River and Great Divide Basins (Sy)	42.3703587	-107.4666503
Antelope Hills	2023567102716B2	2023-08-31	R034AY150WY	Sandy Green River and Great Divide Basins (Sy)	42.3733992	-107.4682840
Antelope Hills	20225613108818B2	2022-07-30	R034AY112WY	Gravelly Green River and Great Divide Basins (Gr)	42.3308525	-107.5662050
Antelope Hills	20225613108818B1	2022-07-30	R034AY112WY	Gravelly Green River and Great Divide Basins (Gr)	42.3269415	-107.5644525
Crooks Mountain	LFO2022-039	2022-07-25	R034XY350WY	Sandy High Plains Southeast (Sy)	42.4939398	-108.0013228
Crooks Mountain	LFO2022-083	2024-06-22	R043BY308WY	Coarse Upland (CU) 15-19" Foothills and Mountains East Precipitation Zone	42.4155829	-107.9862500
Crooks Mountain	20245613100214B3	2024-09-04	R034AY246WY	Sands Foothills and Basins West (Sa)	42.5147549	-108.0210839
Crooks Mountain	20245613100214B2	2024-08-30	R034AF122WY	Loamy Beaver Rim (Ly BR)	42.5122308	-108.0143756

Tables 5 through 7 depict the relationship between the observed AIM data and reference ecological condition as described in Natural Resource Conservation Service (NRCS) Ecological Site Descriptions. Appendix B includes additional detailed tables which display the community composition and the percentage of bare ground[4], foliar cover[5], and litter cover[6] for each HMA. Of note, sites with invasive annual grasses and forbs will typically have lower bare ground and higher litter cover due to thatch and standing dead litter, and as such, figures at or above reference values may not in and of themselves indicate healthy communities.

[4] Bare ground is reported as the percentage of data points with no canopy layers, litter, or rock fragments located above the soil surface.

[5] Foliar cover is reported as the percentage of data points with live vegetative canopy, this is any time a top or middle canopy layer includes vegetation.

[6] Litter cover is reported as the percentage of data points where herbaceous, woody, or embedded litter is encountered. Total litter does not provide a proportion of a whole, in relation to bare ground and foliar cover, but is an additional data point that is of note.

Table 8: Antelope Hills HMA LPI Site Composition[7]

Plot ID	Grass and Grasslikes %	Perennial Forbs %	Shrubs %	Bare Ground %	Total Litter %	Invasives %[8]	Soil Stability
LFO2022-T-14	<	>	<	=	>	>	<
LFO2022-018	<	<	=	<	>	>	=
LFO2022-T-13	<	=	<	>	>	>	<
LFO2022-T-20	<	=	>	=	>	=	<
LFO2022-061	=	>	>	<	>	>	=
LFO2022-T-23	<	>	>	<	>	=	<
LFO2022-T-19	<	<	>	<	>	=	=
LFO2022-T-21	<	<	>	<	>	>	<
LFO2022-089	<	>	>	<	>	=	=
LFO2024-T-07	<	=	=	=	>	>	=
2023567102716B1	<	=	=	=	<	=	=
2023567102716B2	<	<	>	=	=	=	=
20225613108818B2	<	=	>	<	>	=	=
20225613108818B1	<	=	>	<	>	>	=
Buffalo Gulch	<	=	>	=	>	<	
Circle Bar	<	>	<	<	=	=	
Daley Lake	<	>	=	<	<	=	
Dego Pete	<	=	>	=	<	=	
Horsetrack Well	<	>	>	>	=	=	
OPI Well	<	>	=	<	<	=	

[7]

Key	
=	within reference
<	below reference
>	above reference
	no reference data available

[8] Invasives are not listed in reference condition (above 0 is therefore assumed as above reference condition).

Table 9: Green Mountain HMA LPI Site Composition

Plot ID	Grass and Grasslikes %	Perennial Forbs %	Shrubs %	Bare Ground %	Total Litter %	Invasives % *	Soil Stability
LFO2022-019						=	
LFO2022-003						=	
LFO2022-051	<	>	>	<	>	=	<
RFO2021-095						=	
LFO2022-105						=	
20235613101517B1	<	=	<	>	<	=	<
20235613101517B2	<	<	>	>	<	=	<
20225637102418B2	<	=	=	=	=	=	<
20225637102418B1	<	>	<	=	<	=	=

Table 10: Crooks Mountain HMA LPI Site Composition

Plot ID	Grass and Grasslikes %	Perennial Forbs %	Shrubs %	Bare Ground %	Total Litter %	Invasives % *	Soil Stability
LFO2022-039	<	<	=	>	<	=	<
LFO2022-083	<	=	=	=	=	=	<
20245613100214B3	<	<	>	=	=	=	<
20245613100214B2	=	<	=	=	<	=	=

Riparian and Wetland Conditions

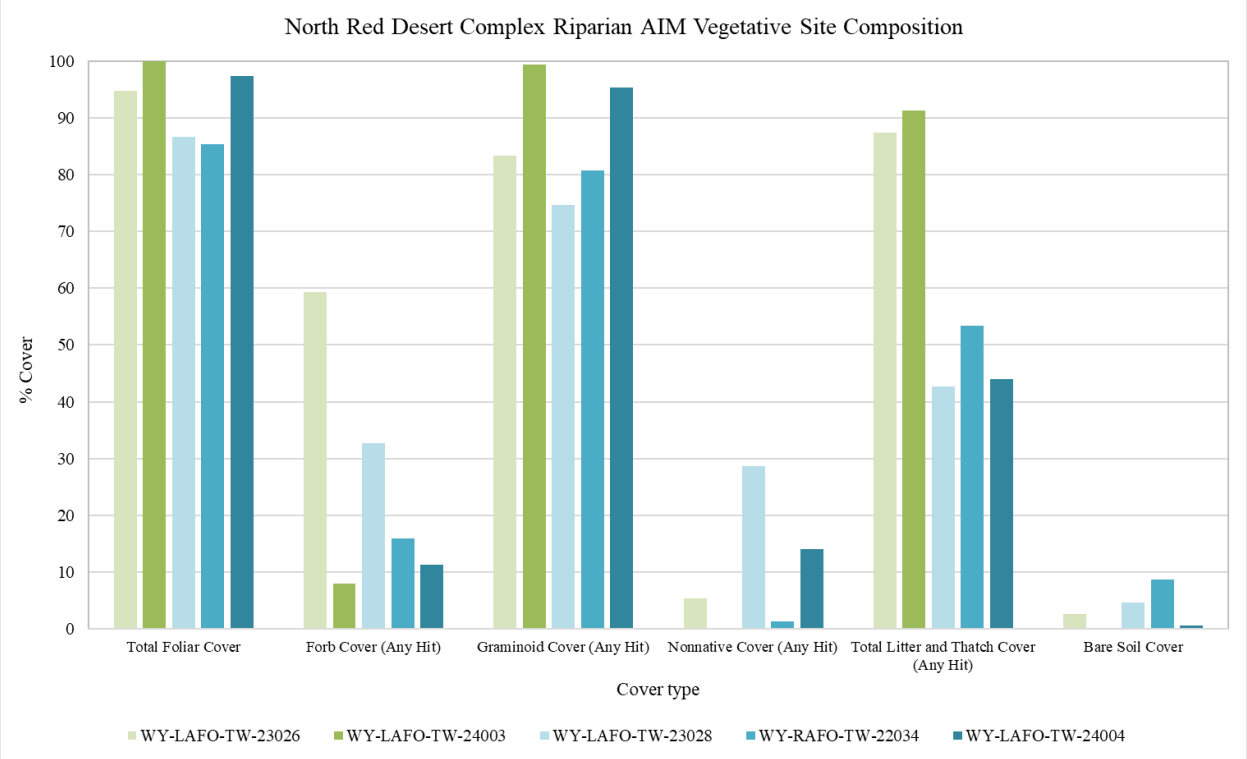
Riparian/wetland AIM is a standardized way the BLM measures the condition of streams, floodplains, and wetlands using consistent, repeatable field methods. It focuses on collecting objective data about vegetation, hydrology, and physical site characteristics so managers can understand how these systems are functioning compared to what's expected for their ecological setting.

This data helps us see whether riparian and wetland areas are stable, resilient, and providing key functions like bank stability, habitat, and water storage. It can show where things are improving, where there are stressors such as erosion or invasive species, and whether management changes are having the intended effect. Ultimately, riparian/wetland AIM gives managers a solid, defensible foundation for decisions related to wild horse and grazing impacts, restoration, and long-term resource planning.

Table 11: North Red Desert Complex Riparian AIM Site Detail

Plot ID	Site Name	Latitude (WGS84)	Longitude (WGS84)	Elevation (m)
WY-LAFO-TW-23026	Chicken Springs Inside	42.38975872	-108.5093549	2252
WY-LAFO-TW-24003	Wager Meadows Paired - Inside	42.36720736	-108.4613448	2238
WY-LAFO-TW-23028	Sand Spring - Crooks Crk rip pasture	42.31004963	-107.7774814	2190
WY-RAFO-TW-22034	Kinch Mckinney 2	42.201525	-108.4835117	2087
WY-LAFO-TW-24004	Wager Meadows Paired - Outside	42.36915463	-108.4325931	2227

Figure 1: North Red Desert Complex Riparian AIM Site Vegetative Composition



*WY-LAFO-TW-23026 and WY-LAFO-TW-24003 (represented in green) are fenced and unavailable to wild horse and livestock use, WY-LAFO-TW-23028, WY-RAFO-TW-22034 and WY-LAFO-TW-24004 (represented in blue) are subject to horse and livestock grazing.

Table 12: North Red Desert Complex Riparian AIM Site Composition

Plot ID	Location	Total Foliar Cover %[9]	Forb Cover (AH)[10] %	Graminoid Cover (AH) %	Nonnative Cover (AH) %	Total Litter and Thatch Cover (AH) %	Bare Soil Cover %[11]
WY-LAFO-TW-23026	Inside Exclosure	94.7	59.3	83.3	5.3	87.3	2.7
WY-LAFO-TW-24003	Inside Exclosure	100.0	8.0	99.3	0.0	91.3	0.0
WY-LAFO-TW-23028	Outside Exclosure	86.7	32.7	74.7	28.7	42.7	4.7
WY-RAFO-TW-22034	Outside Exclosure	85.3	16.0	80.7	1.3	53.3	8.7
WY-LAFO-TW-24004	Outside Exclosure	97.3	11.3	95.3	14.0	44.0	0.7

Stubble height data provides a quick, objective snapshot of how much vegetation remains after wild horse and livestock grazing and how well a riparian area can continue to function. Measuring the height of the leftover plant material helps show the intensity and timing of livestock use, the remaining leaf area available for plant recovery, and the site's ability to support key functions like bank stability, shading, and habitat. Stubble height is a simple

[9] Foliar cover is reported as the percentage of data points with live vegetative canopy, this is any time a top or middle canopy layer includes vegetation.

[10] Any hit ("AH") indicators calculated as the absolute cover (i.e. percent of total LPI pin drops) of a particular species, trait group, or non-plant code as observed at any level in a pin drop. These indicators speak to plant species dominance and cover. AH should not be summed together to aggregate indicators since they are not additive, e.g. two species hit on the same pin drop are overlapping and should count as a single hit when added together. (BLM AIM Riparian and Wetland Database, 2023)

[11] Bare ground is reported as the percentage of data points with no canopy layers, litter, or rock fragments located above the soil surface.

indicator that links wild horse and livestock grazing use to riparian resilience and helps managers evaluate whether vegetation is being left in a condition that supports longterm ecosystem health.

Figure 2: Antelope Hills HMA Riparian Utilization 2022-2025

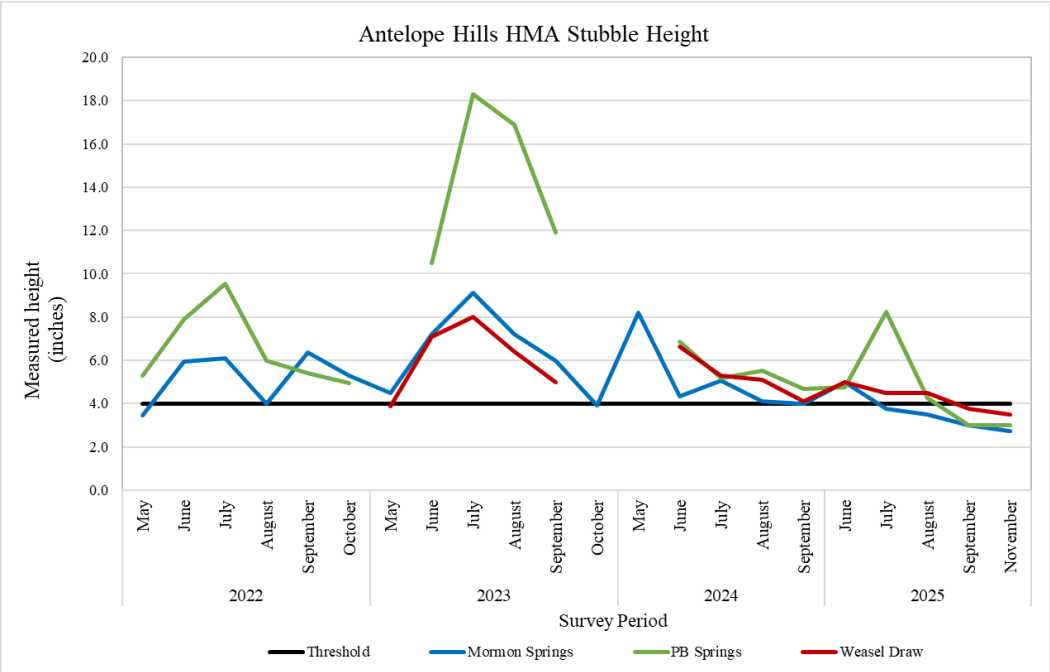


Figure 3: Crooks Mountain HMA Riparian Utilization 2022-2025

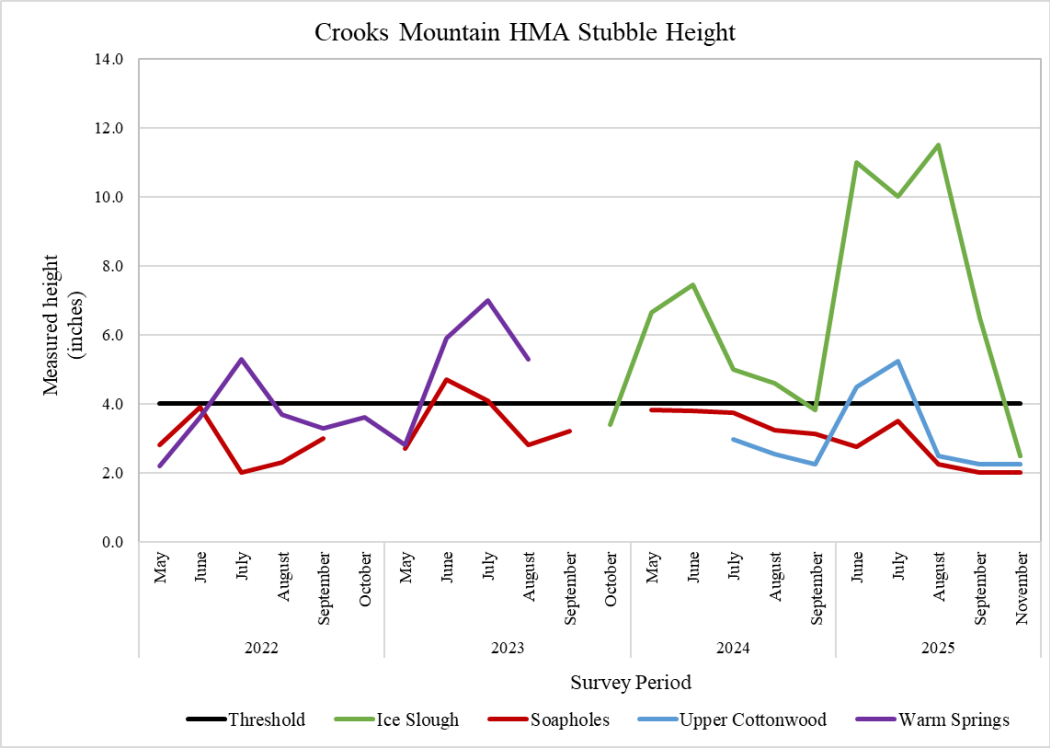

Crooks Mountain HMA Stubble Height
Measured height (inches)
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
May
June
July
August
September
October
May
June
July
August
September
October
May
June
July
August
September
June
July
August
September
November
2022
2023
2024
2025
Survey Period
Threshold
Ice Slough
Soapholes
Upper Cottonwood
Warm Springs

Figure 4 Antelope Hills HMA, Scotty Lake, October 3, 2024

Figure 5: Antelope Hills HMA, Emigrant Springs, November 20, 2025

Figure 6: Crooks Mountain HMA, Ice Slough, October 17, 2022

Figure 7: Crooks Mountain HMA, Soapholes, July 8, 2025

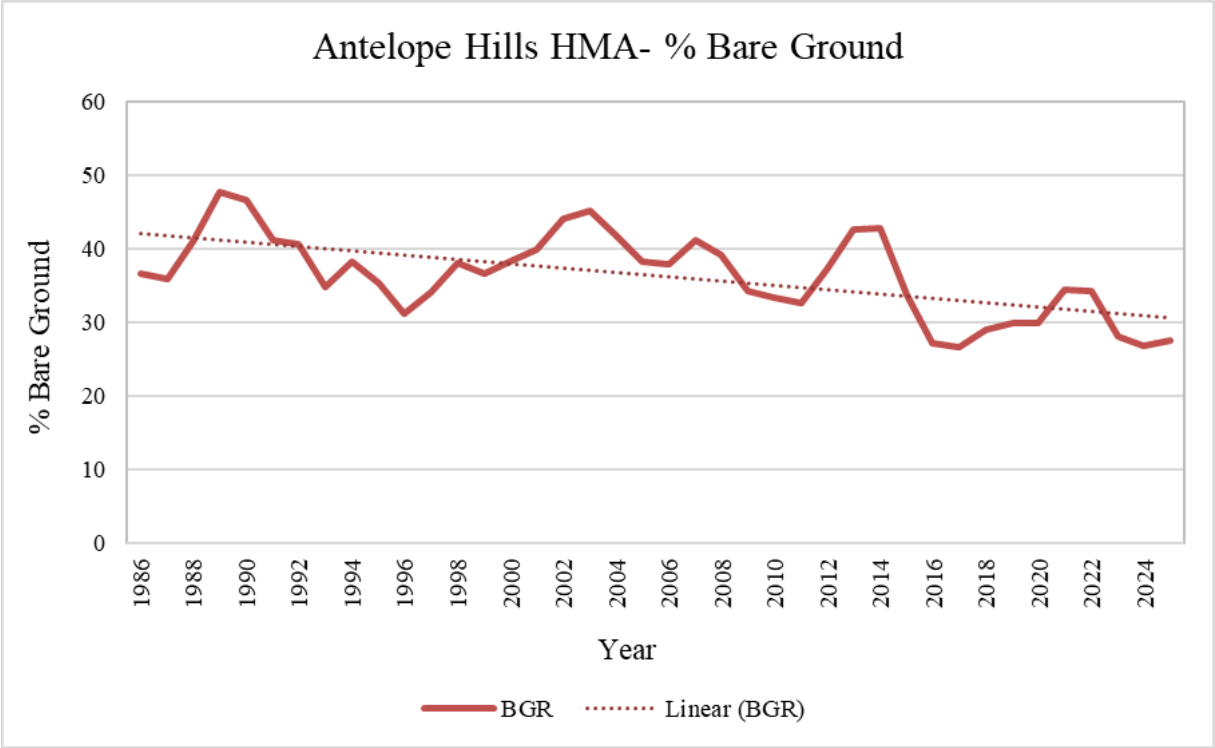
Figure 8: Green Mountain HMA, Cooper Creek, September 14, 2022

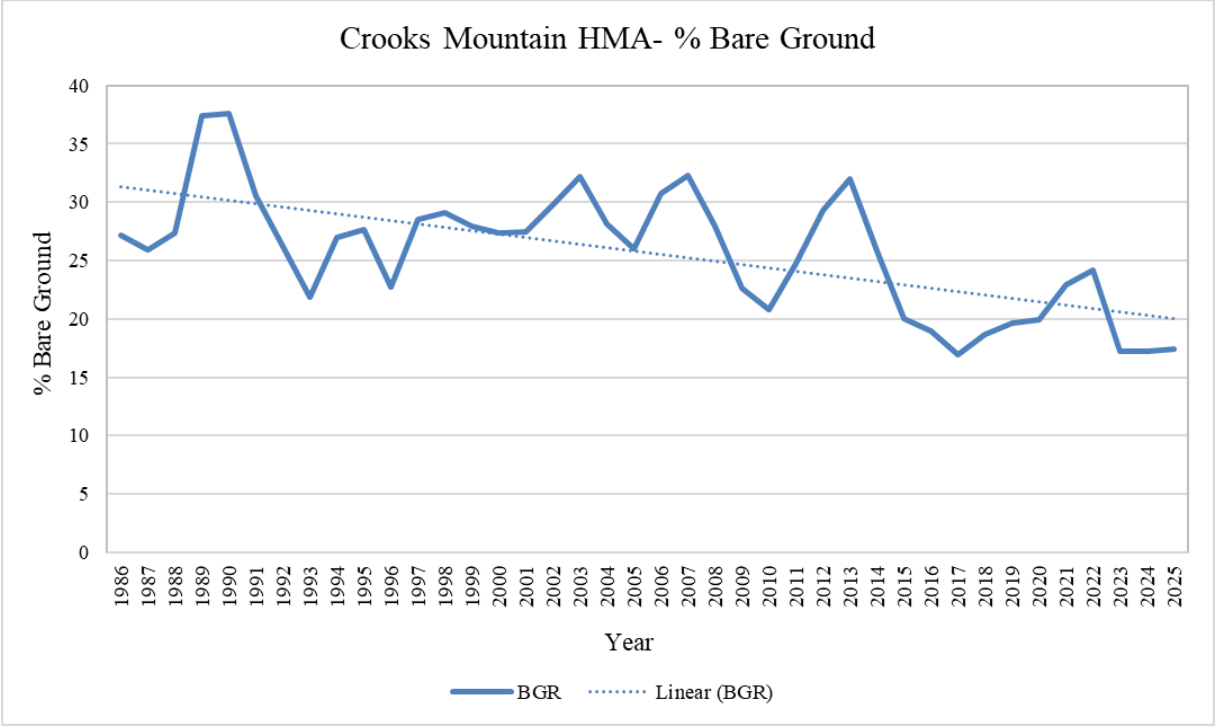
Remote Sensing

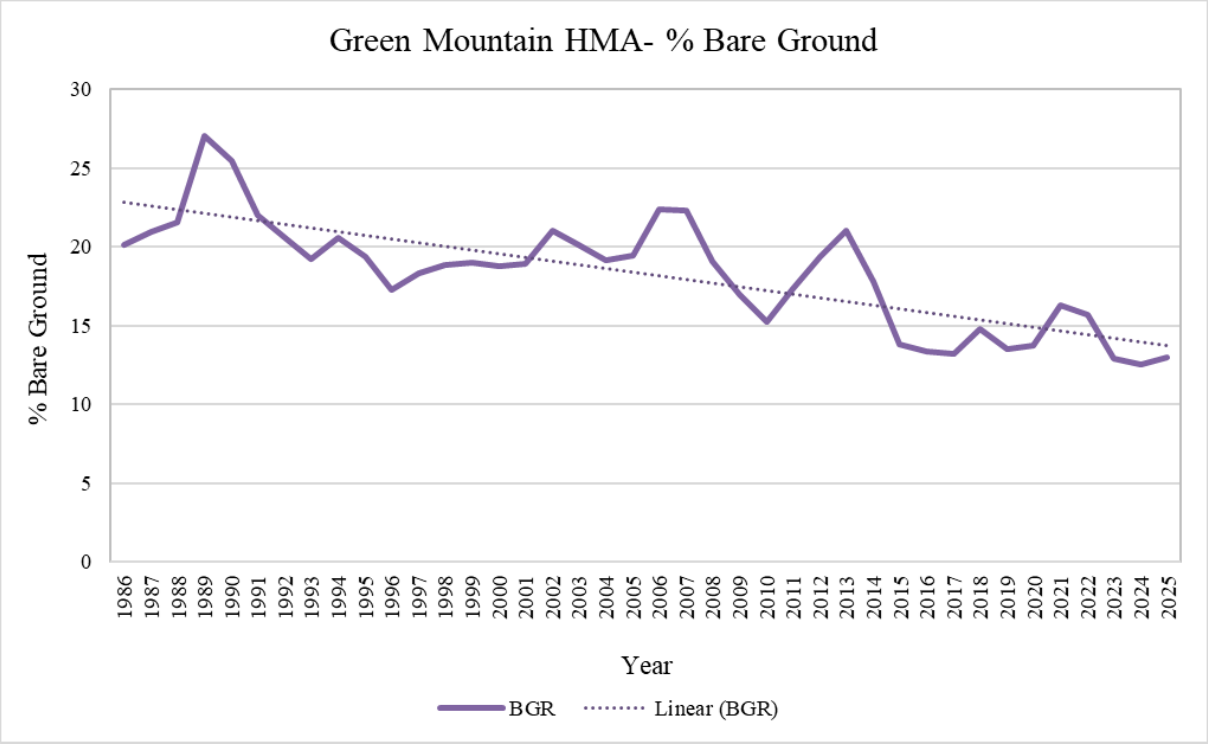
While field-gathered data is invaluable in describing fine scale plots at a point in time, traditional methods are limited in their ability to describe landscapes at broader spatiotemporal scales (Robinson, 2019). Models making use of remote sensing data are a valuable complement to, though they do not replace the need for, field-gathered data. The Rangeland Analysis Platform (RAP) remote sensing product was used to further evaluate the trend in condition of the HMAs.

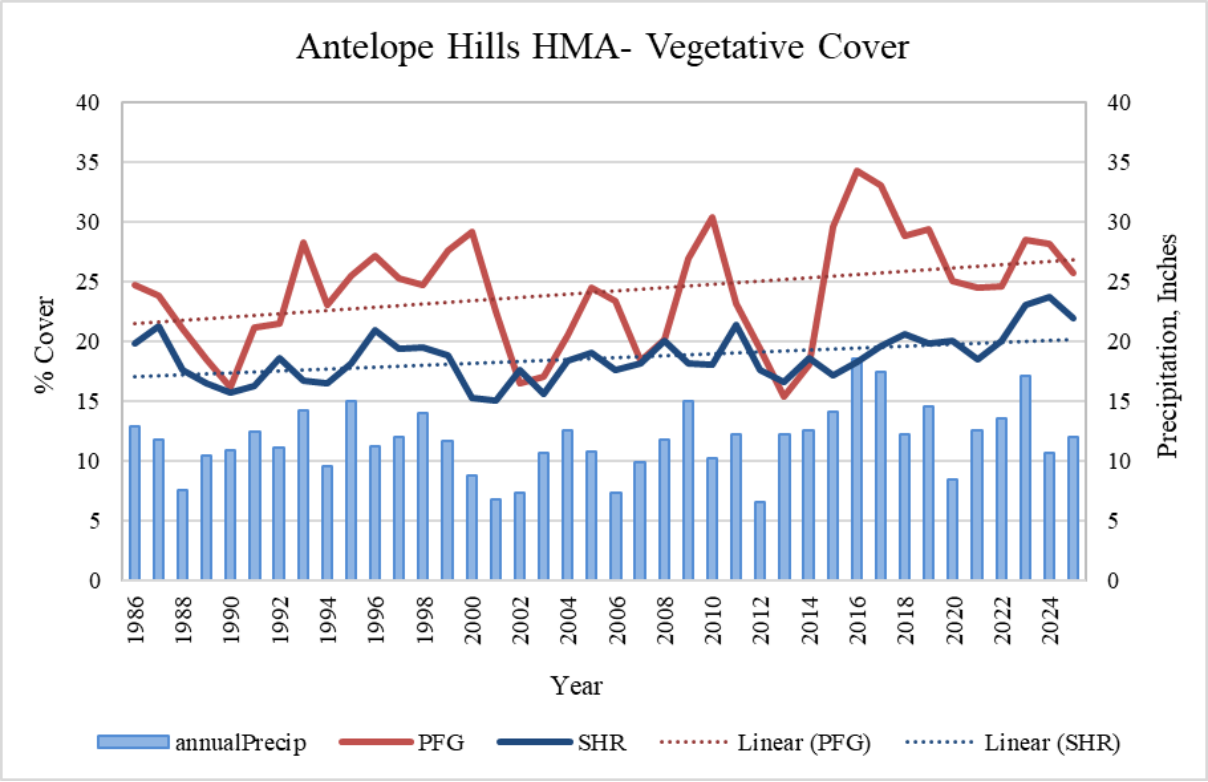
RAP is a free online application developed by the University of Montana in collaboration with the NRCS and BLM which combines field data from the NRCS National Resources Inventory and BLM AIM data with historical Landsat records, gridded meteorology, and abiotic land surface data. The application uses Google Earth Engine to produce charts and maps at 30m x 30m resolution (University of Montana, 2021).

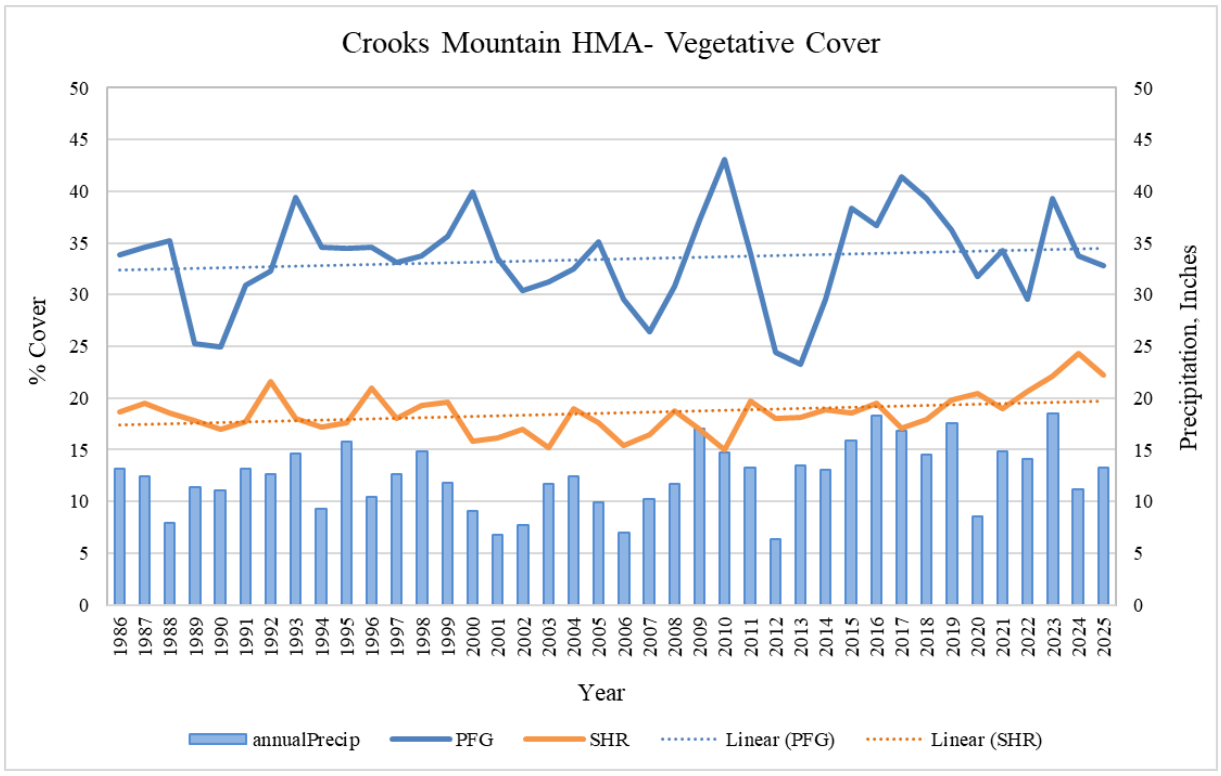
Graphs fitted with a trendline were developed using RAP data for percent bare ground, vegetative cover, and annual biomass from 1986 to 2025. This data shows the changes in each range condition attribute since the last HMAP was completed in 1993.

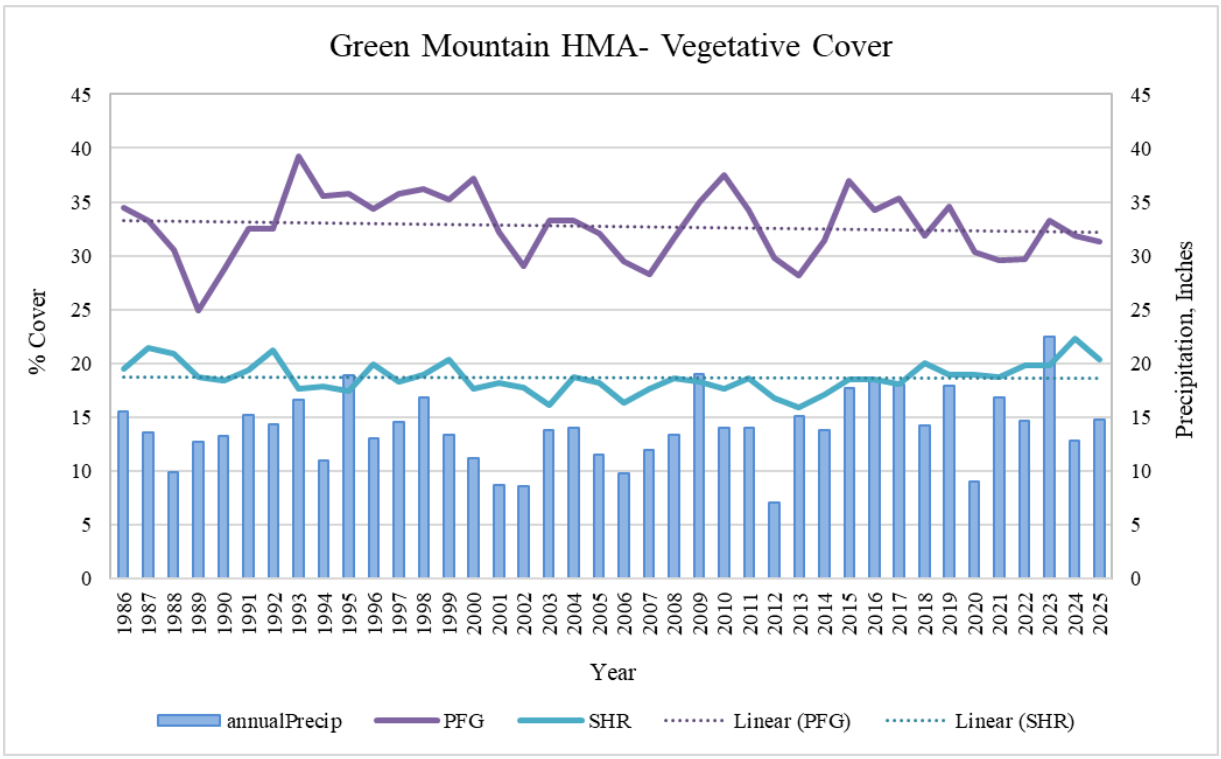

Antelope Hills HMA- % Bare Ground
% Bare Ground
60
50
40
30
20
10
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
Year
BGR
Linear (BGR)

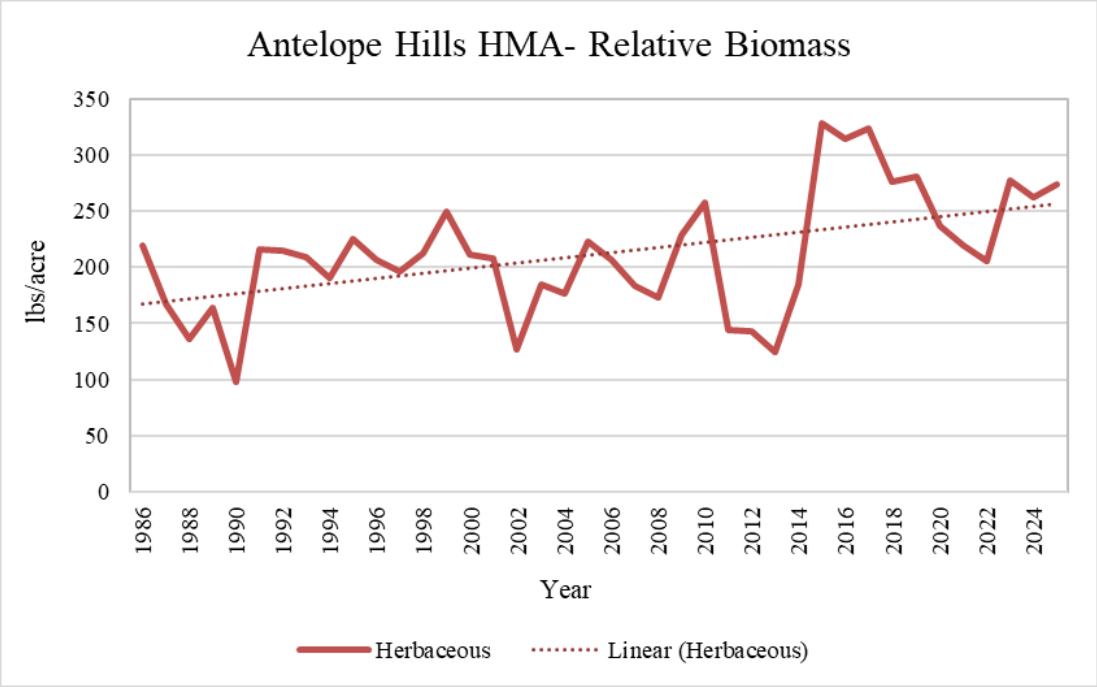

Crooks Mountain HMA- % Bare Ground
% Bare Ground
40
35
30
25
20
15
10
5
0
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Year
BGR
Linear (BGR)

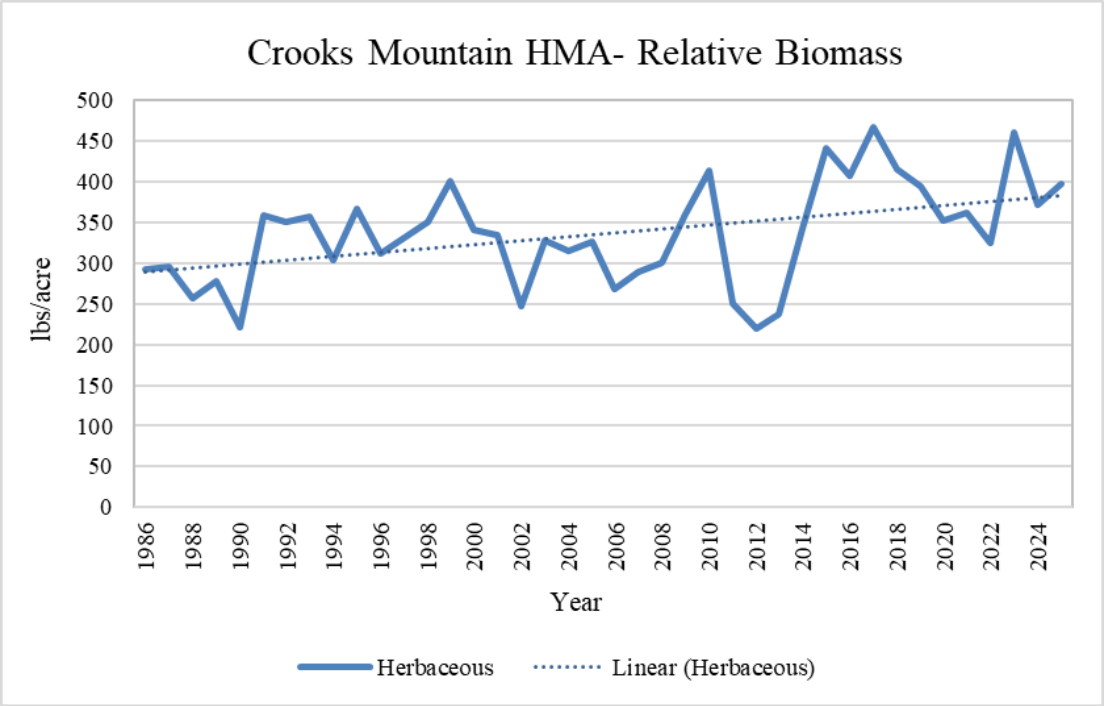

Green Mountain HMA- % Bare Ground
% Bare Ground
Year
BGR
Linear (BGR)

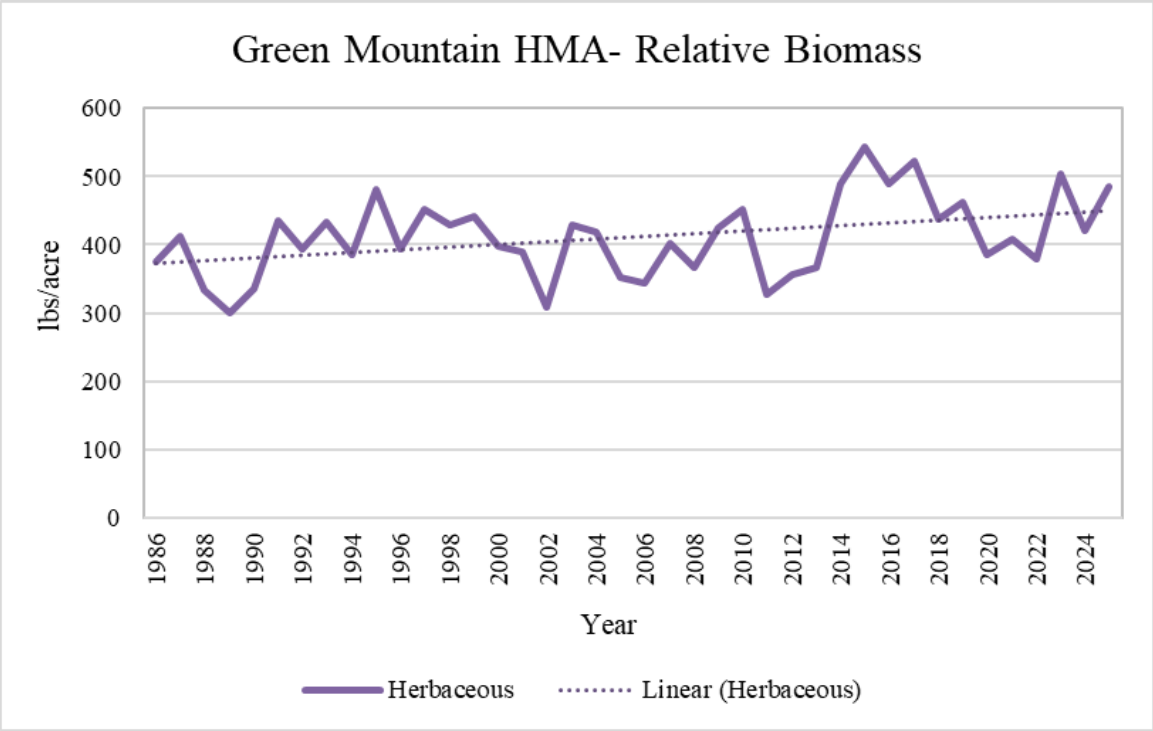

Antelope Hills HMA- Vegetative Cover
% Cover
Precipitation, Inches
Year
annualPrecip
PFG
SHR
Linear (PFG)
Linear (SHR)


Crooks Mountain HMA- Vegetative Cover
% Cover
Precipitation, Inches
Year
annualPrecip
PFG
SHR
Linear (PFG)
Linear (SHR)


Green Mountain HMA- Vegetative Cover
% Cover
Precipitation, Inches
Year
annualPrecip
PFG
SHR
Linear (PFG)
Linear (SHR)


Antelope Hills HMA- Relative Biomass
lbs/acre
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
Year
Herbaceous
Linear (Herbaceous)


Crooks Mountain HMA- Relative Biomass
lbs/acre
500
450
400
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
Year
Herbaceous
Linear (Herbaceous)



Monitoring Summary

Overall, the Terrestrial AIM results show considerable variation across plots and HMAs, with many sites exhibiting lower than expected perennial grass cover and higher invasive species presence, even where litter levels appear adequate. Tables provided for each HMA summarize whether key indicators fall below, meet, or exceed reference values.

Riparian AIM data from five sites across the North Red Desert Complex shows strong contrasts between exclosed areas and those exposed to wild horse and livestock use. The two fenced sites had very high foliar cover, strong graminoid dominance, minimal bare soil, and high litter—characteristics of stable, resilient riparian systems with good hydrologic function. In contrast, the grazed sites exhibited lower litter, more bare soil, and in some cases higher non-native cover, indicating reduced vegetation protection and potentially greater vulnerability to bank erosion and reduced recovery potential. Stubble height data reinforces this picture by highlighting where repeated grazing pressure is removing residual vegetation needed to maintain streambank integrity and plant regrowth.

Remote sensing data from the Rangeland Analysis Platform provides a long term, landscape scale view of vegetation conditions in the North Red Desert HMAs from 1993 to 2025. Trendlines for bare ground, total vegetative cover, and annual biomass show how each HMA has changed since the last HMAP, revealing whether conditions have been generally improving, declining, or remaining stable over multiple decades. Because RAP integrates AIM and NRI field data with satellite imagery and climate information, it helps distinguish real ecological trends from short term variability due to weather.

These RAP trends complement the upland and riparian AIM findings by placing plot level measurements within the broader context of HMA wide change. Where AIM data shows localized reductions in perennial grasses, elevated invasive species presence, or signs of soil exposure, RAP can indicate whether these patterns reflect widespread landscape trends or isolated site conditions. Likewise, long term shifts in vegetative cover or bare ground can help interpret current riparian conditions by showing how upland watershed health has evolved over time. Combined, RAP and AIM provide a more comprehensive and defensible understanding of ecosystem condition and trajectory across the Complex.

FUTURE MANAGEMENT

Since the passage of the WFRHBA, management knowledge regarding wild horse population levels has increased. For example, it has been determined that wild horses are capable of increasing their numbers by 15% to 25% annually, resulting in the doubling of wild horse populations about every 4 years (NRC 2013). This has resulted in the BLM shifting program emphasis beyond just establishing AML and conducting wild horse gathers to include a variety of management actions that further facilitate the achievement and maintenance of viable and stable wild horse populations and a thriving natural ecological balance. Management actions include increasing fertility control, adjusting sex ratio, and collecting genetic baseline data to support genetic health assessments.

PZP and PZP 22 has been used in the complex multiple times in conjunction with gathers. Because PZP is only effective for a short period of time, and because most mares it is administered to are already pregnant, neither of these drugs has made an appreciable difference in population growth rates within the North Red Desert Complex. PZP is most effective when administered annually. This is only feasible in small herds where horses are gentle and easily approached. The horses in the North Red Desert Complex do not fall into this category.

Sex ratio skewing has been used in the complex in the past with minimal success. There is no record of other fertility control treatments being used up to this time.

The AML is defined as the number of wild horses that can be sustained within a designated HMA which achieves and maintains a thriving natural ecological balance in keeping with the multiple-use management concept for the area. The complex has an AML range of 295-467 wild horses which has been established through decisions as outlined in this document. In order to reduce the gather frequency of this complex a more aggressive approach to fertility control will be required.

Population growth suppression measures include the administration of fertility control measures (i.e. PZP vaccines, GonaCon or newly developed vaccine formulations) to released mares and adjustment of sex ratios to achieve a higher male to female sex ratio. In addition, gelding some of the stallions within the complex to create a non-reproducing component of the herd would reduce the population growth rate simply by reducing the percentage of horses within the AML that are reproducing. As noted previously, some of the fertility control measures have been used in the past with limited effectiveness. In order to be effective a combination of fertility treatments may have to be used in conjunction. Full implementation will require multiple gathers and multiple treatments.

Having a suite of fertility control options would allow herd management to be tailored to specific areas. The ultimate goal would be to reduce population growth to a point where gather intervals would be greatly increased, but not so far that the population could dip below the AML. This would likely require a combination of fertility control methods, but it is unlikely that all of them would be used. Lower input and less invasive methods would be given initial preference, but other methods could be added as needed to achieve population growth rates that would be sustainable over longer time frames.

Primary gather methods include helicopter drive and/or bait and water trapping. While it is the BLM's goal to immediately gather excess wild horses and/or gather wild horses for fertility treatment in a single gather, it is expected that not all horses can be captured because gather efficiencies rarely exceed 80-85% especially in larger Complexes. As a result, a proportion of wild horses (15-20%+) in the complex may not be captured or treated over a 10-year gather period.

During a gather, horses are identified for removal or release based on age, gender, and/or other characteristics. Mares identified for release would be aged, microchipped and freeze-marked for identification prior to being released to help identify the animals for future treatments/boosters and assess the efficacy of fertility control treatments. Darting could also be utilized as a tool to treat and booster mares between gather cycles, but it would not be effective in controlling the population as a standalone method.

As noted in the genetic analysis for this complex, the 5 HMAs in the Red Desert complex are essentially one interbreeding population with good genetic variability and diversity. Implementation of more aggressive fertility control may reduce the number of individuals who are contributing to the genetics of their respective populations, but interbreeding between herds is not likely to change as a result of fertility treatments. This interchange could be further encouraged by shuffling a few young females between HMAs in the complex in conjunction with gathers to promote continued genetic diversity.

MANAGEMENT ISSUES

The key components for maintaining a healthy wild horse population are forage, water, cover, and space. Forage and water availability is generally sufficient for the wild horses in this complex, especially when the population is maintained at the AML. Riparian use by wild horses can be excessive and detrimental, especially during extended periods of severe drought coinciding with high wild horse numbers. Cover and space are sufficient only when the HMAs in the complex are at the AML.

It is important to note that these HMAs are not exclusively used by wild horses. In accordance with BLM's multiple use mandate there are many other legal users of the land within these HMA boundaries. This can make attributing impacts to a specific land use or user difficult. When talking about impacts to forage, water, cover, and space blame is often attributed to the "other" users. As this relates to wild horses, it is clear that wild horses are contributing to impacts on the landscape, but they are not the only contributors. By the same token, other users also contribute

to these impacts and cause their own unique impacts which may directly or indirectly affect wild horses. The purpose of this management evaluation is not to parse out impacts by resource uses. The goal of this evaluation is to compare current use with past use, and to identify any future changes relating to wild horses that need to be made.

This evaluation shows that wild horse habitat is similar or possibly slightly improved since the last time an evaluation was performed, but wild horses are still contributing to impacts on certain rangeland resources especially when the population exceeds the AML. In the prior evaluations of the HMAs in this complex space was identified as a major factor in the determination of the AML. This has not changed. With numbers currently well above AML we are seeing horses leave the HMAs for private land and for allotments not designated for their use. Major changes since the last management evaluation include the development of new fertility control treatments, a huge increase in the total national wild horse population, and advances in technology for genetics monitoring. This evaluation identifies management actions that are working and those areas where management could be improved. This evaluation in conjunction with public input will be used to develop a new Herd Management Area Plan to guide future wild horse management within this complex.

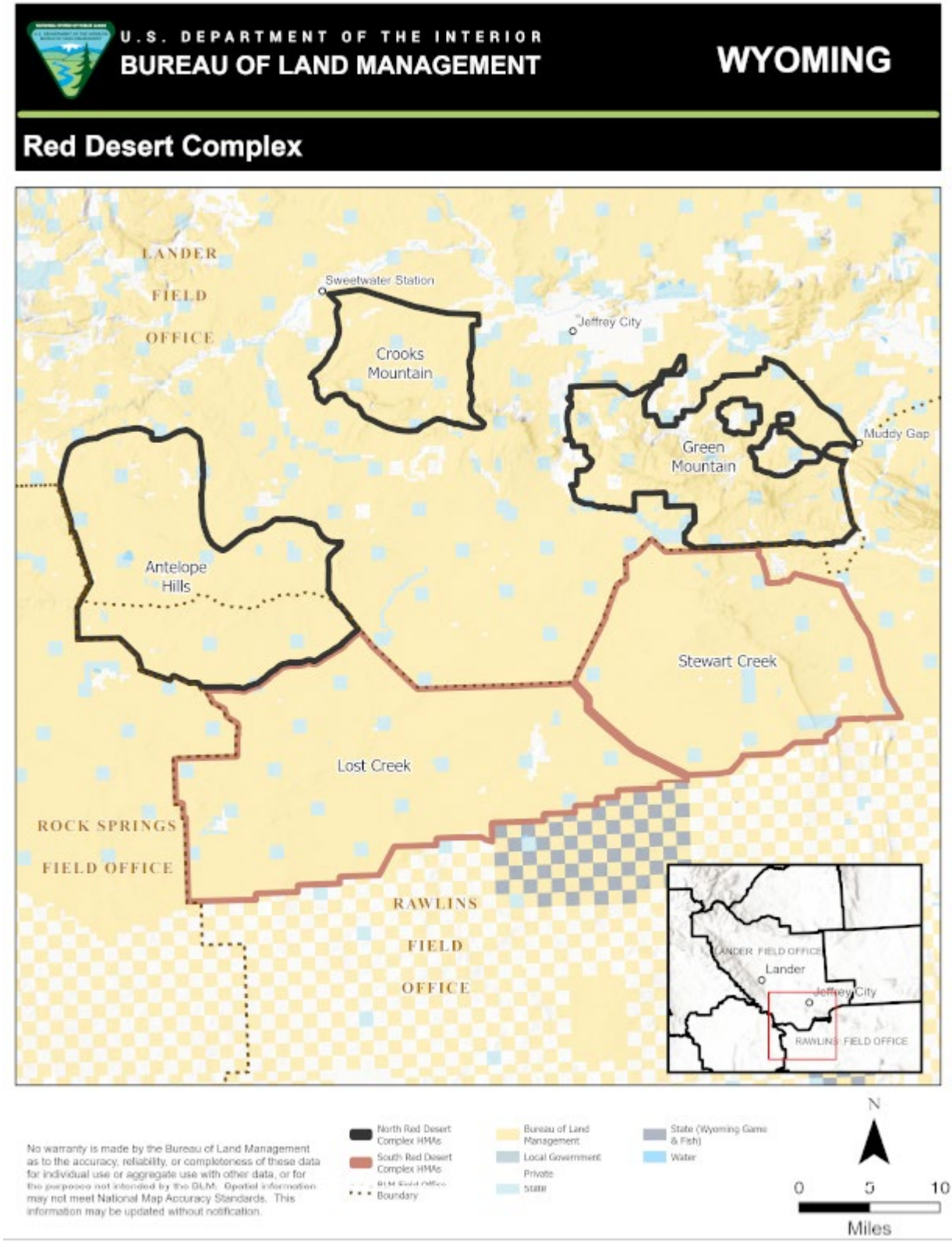
HMAP RECOMMENDATIONS

The BLM intends to prepare a HMAP to guide management of the wild horses and their habitat into the future. The HMAP will address the following management objectives:

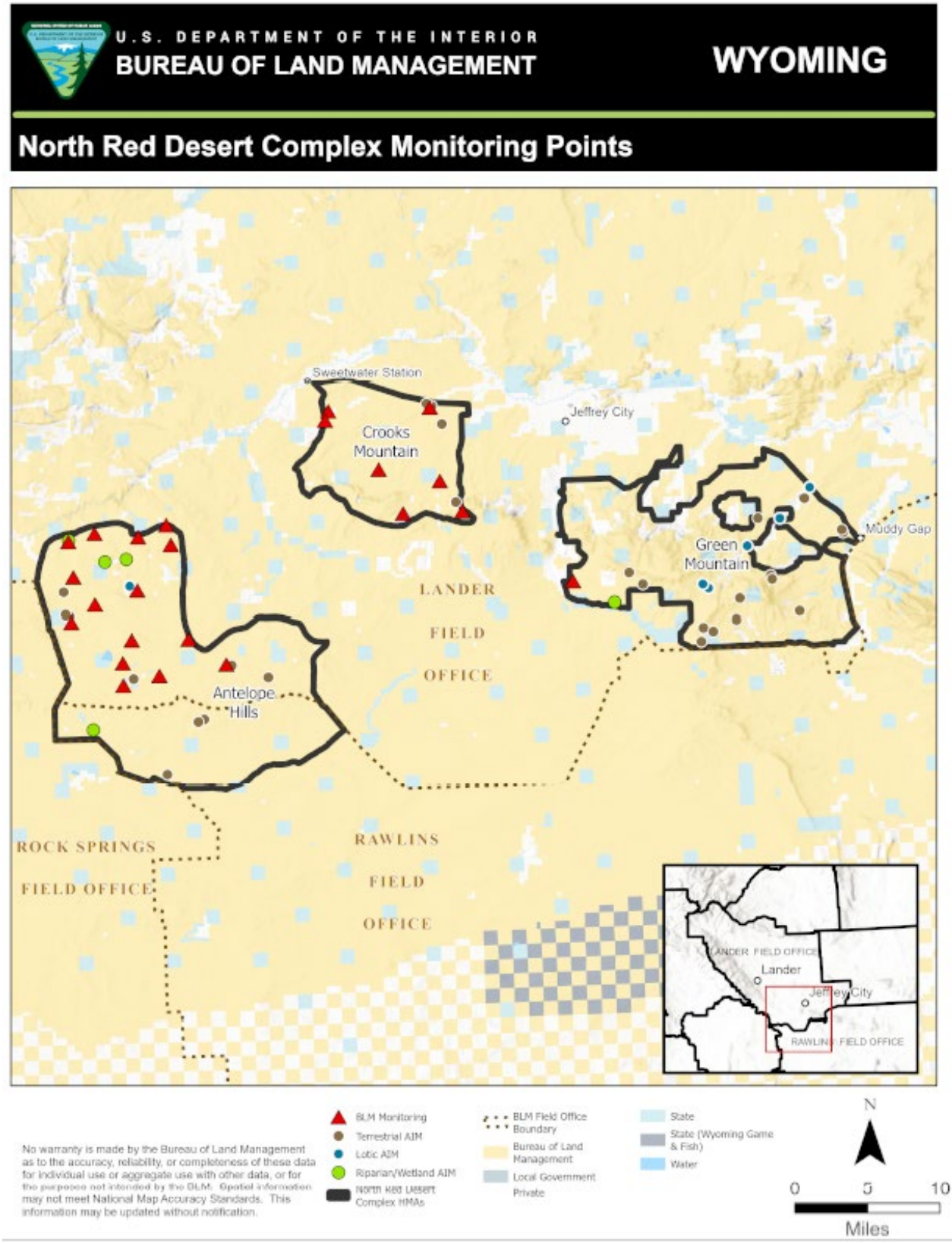
- Manage wild horses within HMAs at AML
- Ensure rangeland and riparian health
- Utilize population growth suppression methods
- Maintain and ensure genetic diversity
- Utilize selective removal and retention criteria to improve overall horse quality
- Maintain Greater Sage-Grouse habitat
- Other issues as identified

APPENDIX A: MAPS

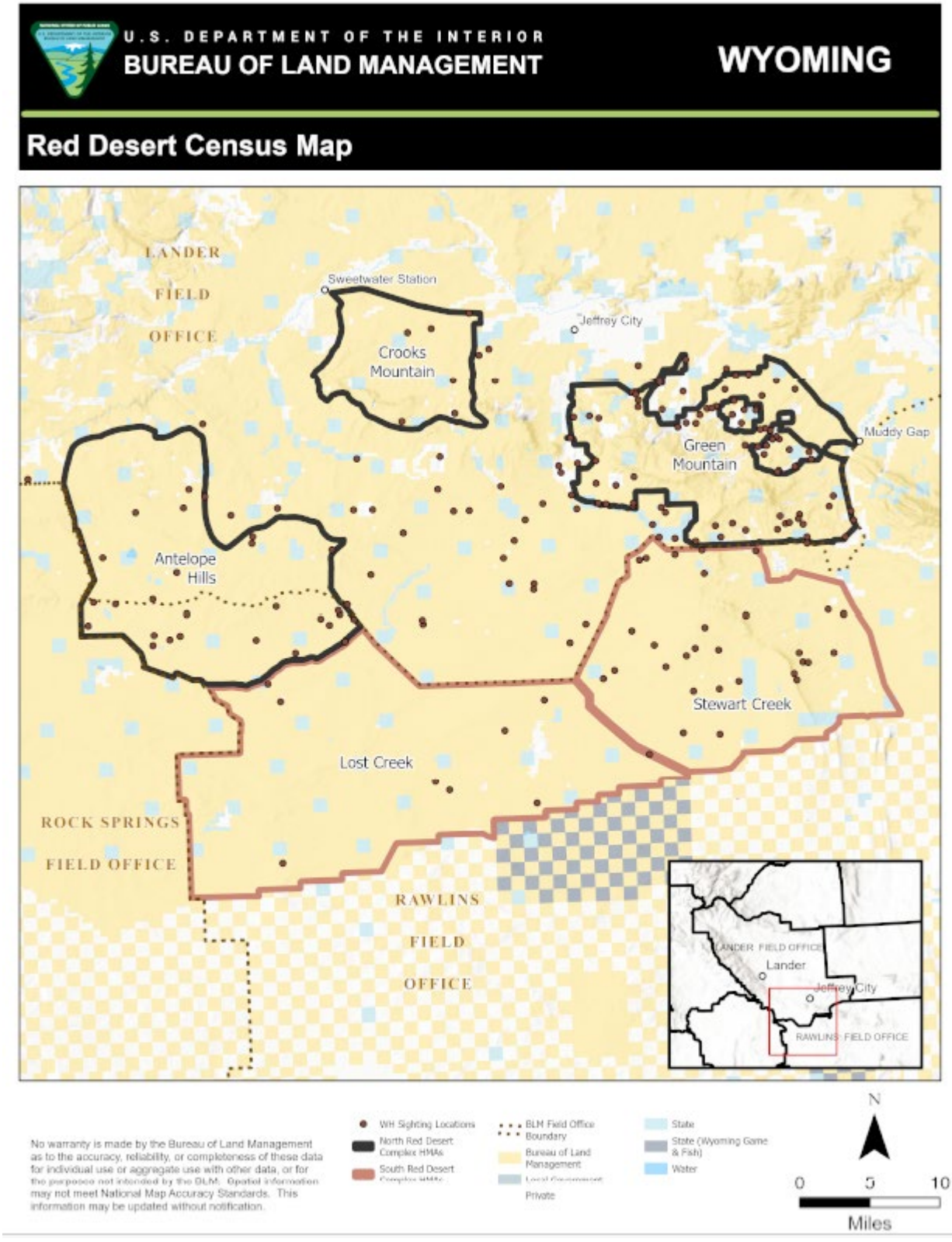
Map 1. Red Desert Complex HMA Boundaries



Map 2. North Red Desert Monitoring Points



Map 3. North Red Desert Wild Horse Census Data



APPENDIX B: DETAILED MONITORING DATA TABLES

Table: HMA utilization site detail

HMA	Site Name	Latitude	Longitude
Antelope Hills	Buffalo Gulch	42.353927	-108.504491
Antelope Hills	Chicken Springs	42.389425	-108.509839
Antelope Hills	Circle Bar	42.309824	-108.508868
Antelope Hills	Daley Lake	42.263767	-108.302252
Antelope Hills	Dego Pete	42.326225	-108.476437
Antelope Hills	Emigrant Springs	42.403173	-108.377315
Antelope Hills	Hidden Pond	42.254718	-108.392559
Antelope Hills	Horsetrack Well	42.290738	-108.428394
Antelope Hills	Mormon Springs	42.396706	-108.474281
Antelope Hills	OPI Well	42.289747	-108.352035
Antelope Hills	PB Springs	42.338810	-108.418860
Antelope Hills	Picket Creek	42.268189	-108.441277
Antelope Hills	Scotty Lake	42.246030	-108.441410
Antelope Hills	Upper Willow Creek	42.391913	-108.415614
Antelope Hills	Warm Springs	42.502191	-108.158663
Antelope Hills	Weasel Draw	42.383309	-108.371899
Crooks Mountain	Fremont Canyon	42.451609	-108.088699
Crooks Mountain	Ice Slough	42.511819	-108.016783
Crooks Mountain	Lower Haypress	42.438178	-108.006776
Crooks Mountain	Oregon Trail	42.511515	-108.153991
Crooks Mountain	Soapholes	42.407100	-108.057770
Crooks Mountain	Upper Cottonwood	42.407023	-107.977951
Green Mountain	Crooks Creek	42.333569	-107.832381

Table: Antelope Hills HMA utilization detail

Year of Survey	Month of Survey	Stubble Height (inches)			
		Threshold	Mormon Springs	PB Springs	Weasel Draw
2022	May	4	3.45	5.3	
	June	4	5.95	7.9	
	July	4	6.1	9.55	
	August	4	4	6	
	September	4	6.35	5.4	
	October	4	5.3	4.95	
2023	May	4	4.5		3.89
	June	4	7.2	10.5	7.1
	July	4	9.1	18.3	8
	August	4	7.2	16.9	6.4
	September	4	6	11.9	5
	October	4	3.92		
2024	May	4	8.2		
	June	4	4.3	6.9	6.6
	July	4	5.1	5.2	5.3
	August	4	4.1	5.5	5.1
	September	4	4.0	4.7	4.1
2025	June	4	5	4.75	5
	July	4	3.75	8.25	4.5
	August	4	3.5	4.25	4.5
	September	4	3	3	3.75
	November	4	2.75	3	3.5

Table: Crooks Mountain HMA utilization detail

Year of Survey	Month of Survey	Stubble Height (inches)				
		Threshold	Ice Slough	Soapholes	Upper Cottonwood	Warm Springs
2022	May	4		2.8		2.2
	June	4		3.9		3.6
	July	4		2		5.3
	August	4		2.3		3.7
	September	4		3		3.3
	October	4				3.6
2023	May	4		2.7		2.8
	June	4		4.7		5.9
	July	4		4.1		7
	August	4		2.8		5.3
	September	4		3.2		
	October	4	3.4			2.2
2024	May	4	6.6	3.8		
	June	4	7.5	3.8		
	July	4	5.0	3.8	3.0	
	August	4	4.6	3.3	2.6	
	September	4	3.8	3.1	2.3	
2025	June	4	11	2.75	4.5	
	July	4	10	3.5	5.25	
	August	4	11.5	2.25	2.5	
	September	4	6.5	2	2.25	
	November	4	2.5	2	2.25	

Table: 2023 LPI Site Descriptions

HMA	Site Name	Latitude	Longitude	Ecosite Name	Ecosite ID	Plant Community Phase[12]
Antelope Hills	Buffalo Gulch	42.353927	-108.504491	Sandy High Plains Southeast	R034AY350WY	2.1[13] Big Sagebrush/Shortgrass Plant Community
Antelope Hills	Chicken Springs	42.389425	-108.509839			
Antelope Hills	Circle Bar	42.309824	-108.508868	Shallow Sandy High Plains Southeast	R034AY366WY	3.1, Short Grass and Grasslike/Forbs Plant Community
Antelope Hills	Daley Lake	42.263767	-108.302252	Sandy High Plains Southeast	R034AY350WY	1.1, Needle and Thread/Rhizomatous Wheatgrass Plant Community (RPC)
Antelope Hills	Dego Pete	42.326225	-108.476437	Sandy High Plains Southeast	R034AY350WY	2.1, Big Sagebrush/Shortgrass Plant Community
Antelope Hills	Horsetrack Well	42.2907376	-108.4283939	Gravelly High Plains Southeast	R034AY312WY	1.1, Bluebunch Wheatgrass Plant Community (RPC)
Antelope Hills	OPI Well	42.289747	-108.352035	Shallow Sandy High Plains Southeast	R034AY366WY	1.1, Mid Bunchgrass Plant Community (RPC)
Crooks Mountain	Fremont Canyon	42.451609	-108.088699			
Crooks Mountain	Oregon Trail	42.5115151	-108.1539908			

[12] Plant Community Phase refers to the state and transition model of plant communities within each ecological site description. Community 1.1 represents the Reference Plant Community (RPC).

[13] Community phase 2.1 is State 2 under the state and transition model. This site has transitioned out of the 1.1 RPC and into Community 2.1, Big Sagebrush/Shortgrass Plant Community.

Table: Antelope Hills HMA species composition

Plot ID	Grass and Grasslikes %		Perennial Forbs %		Shrubs %		Bare Ground %		Total Litter %		Invasives %		Soil Stability	
	Actual	Ref Value	Actual	Ref Value	Actual	Ref Value	Actual	Ref Value	Actual	Ref Value	Actual	Ref Value	Actual	Ref Value
LFO2022-T-14	31.3	50-80%	26.7	15%	0.7	5-35%	16.7	0-20%	42.0	50-90%	22		3.4	4+
LFO2022-018	23.3	50-70%	4.7	5-15%	31.3	15-35%	16.0	30-60%	58.7	10-40%	0.7		3.7	2.5+
LFO2022-T-13	17.3	50-70%	13.3	10-20%	3.3	10-30%	33.3	0-20%	41.3	75-100%	6.7		2.9	4+
LFO2022-T-20	28.0	80%	6.7	5-10%	24.7	10%	19.3	20-30%	44.0	25-35%	0		3.9	5+
LFO2022-061	45.3	45-60%	21.3	5-10%	54.7	5-45%	1.3	20-30%	83.3	30-65%	2.7		3.5	1-6 range
LFO2022-T-23	20.7	75%	18.7	5-10%	41.3	5-10%	7.3	20-30%	64.7	25-35%	0		3.2	4+
LFO2022-T-19	50.7	70%	0.7	5-15%	39.3	20%	4.0	75-85%	76.7	20%	0		4.1	3+
LFO2022-T-21	36.0	80%	4.7	5-10%	22.7	10%	10.0	20-30%	49.3	25-35%	0.7		3.9	5+
LFO2022-089	26.7	70-80%	20.7	5-10%	57.3	10-20%	4.7	20-50%	86.7	10-50%	0		5.1	2.5+
LFO2024-T-07	42.0	45-75%	6.7	5-15%	21.3	10-40%	16.7	0-30%	67.3	70-95%	0.7		5.1	4+
2023567102716B1	34.6	70-80%	9.9	5-10%	19.8	10-20%	33.7	20-50%	6.9	10-50%	0		3.7	2.5+
2023567102716B2	50.5	70-80%	2.0	5-10%	26.7	10-20%	20.8	20-50%	12.9	10-50%	0		3.2	2.5+
20225613108818B2	15.8	60-70%	5.9	5-20%	54.5	10-20%	12.9	25-50%	58.4	5-30%	0		2.7	2+
20225613108818B1	23.8	60-70%	15.8	5-20%	50.5	10-20%	14.8	25-50%	33.7	5-30%	4		3.4	2+
Buffalo Gulch	46.3%	75%	8.0%	5-10%	24.7%	5-10%	23.3	20-30%	38	25-35%	0			
Circle Bar	51.3%	75%	10.3%	5-10%	0.7%	5-15%	29.3	40-60%	24.7	15-25%	0			
Daley Lake	68.6%	75%	30.0%	5-10%	10.0%	5-10%	9.3	20-30%	21.3	25-35%	0			
Dego Pete	43.9%	75%	8.0%	5-10%	29.3%	5-10%	26	20-30%	21.3	25-35%	0			
Horsetrack Well	40.6%	80%	15.3%	5-10%	24.0%	5-10%	28	10-15%	14	10-15%	0			
OPI Well	55.4%	75%	18.0%	5-10%	6.0%	5-15%	28	40-60%	9.3	15-25%	0			

Table: Green Mountain HMA AIM species composition

Plot ID	Grass and Grasslikes %		Perennial Forbs %		Shrubs %		Bare Ground %		Total Litter %		Invasives %		Soil Stability	
	Actual	Ref Value	Actual	Ref Value	Actual	Ref Value	Actual	Ref Value	Actual	Ref Value	Actual	Ref Value	Actual	Ref Value
LFO2022-019	30.0		6.7		19.3		32.7		44.7		0		2.1	
LFO2022-003	38.0		4.7		23.3		19.3		51.3		0		2.4	
LFO2022-051	56.0	75%	14.7	5-10%	46.0	5-10%	6.7	20-30%	74.0	25-35%	0		3.5	4+
RFO2021-095	30.7		3.3		10.7		8.7		41.3		0		4.7	
LFO2022-105	17.3		0.7		19.3		39.3		34.7		0		4.4	
20235613101517B1	13.9	75%	7.9	5-10%	3.0	5-10%	42.6	20-30%	0.0	25-35%	0		2.0	4+
20235613101517B2	15.8	80%	4.0	5-10%	44.5	5-10%	34.6	20-30%	11.9	25-35%	0		2.8	4+
20225637102418B2	21.8	55-70%	5.9	5-15%	24.8	15-30%	43.6	20-50%	10.9	10-60%	0		2.4	3+
20225637102418B1	29.7	70-80%	14.8	5-10%	5.9	10-20%	46.5	20-50%	6.9	10-50%	0		2.7	2.5+

Table: Crooks Mountain HMA AIM species composition

Plot ID	Grass and Grasslikes %		Perennial Forbs %		Shrubs %		Bare Ground %		Total Litter %		Invasives %		Soil Stability	
	Actual	Ref Value	Actual	Ref Value	Actual	Ref Value	Actual	Ref Value	Actual	Ref Value	Actual	Ref Value	Actual	Ref Value
LFO2022-039	12.7	75%	1.3	5-10%	10.0	5-10%	40.7	20-30%	22.7	25-35%	0		2.6	4+
LFO2022-083	31.3	50-80%	8.0	15%	31.3	5-35%	2.7	0-20%	57.3	50-90%	0		3.0	4+
20245613100214B3	3.0	60-75%	0.0	5-15%	52.5	10-25%	30.7	20-50%	46.5	20-50%	0		1.4	2.5+
20245613100214B2	44.5	20-60%	1.0	5-15%	22.8	5-50%	16.8	15-25%	23.8	30-60%	0		1.9	1-6 range