Appendix C
AML Re-Evaluation Report

Introduction

The BLM is re-evaluating the Pryor Mountain Wild Horse Range (PMWHR) Appropriate Management Level (AML) to determine the appropriate number of adult horses the PMWHR can support (current year foals are excluded from the calculation). Previous AML re-evaluations established AMLs of:

- 90-120 wild horses in the 2009 HMAP. In the Decision Notice approving the 2009 HMAP, the BLM stated that monitoring data will continue to be collected and the AML will be re-calculated within five years or after the revision to the Billings RMP, whichever comes first.
- 85-105 wild horses in the July 1992 HMAP; and
- 115-127 wild horses in the June 1984 Pryor Mountain Herd Management Plan and the 1984 Billings Resource Area Management Plan.

This re-evaluation report factors in ecological condition of the upland and riparian areas analyzed in the rangeland health assessment. The goal is to ensure a thriving natural ecological balance, protect animal health, and make progress towards Standards for Rangeland Health. The authority of establishing the AML for the horse range is from the Wild and Free Roaming Horses and Burros Act (PL 92-195, 16 U.S.C. Section 1333(a)) which states that the "*Secretary shall manage wild free-roaming horses and burros in a manner designed to achieve and maintain a thriving ecological balance on public lands*." The Act also states that the BLM and Forest Service shall protect the range from deterioration associated with overpopulation. Based on guidance from the Wild Horses and Burros Management Handbook (H-4700-1) this AML re-evaluation report uses multiple sources of data to provide the most informed analysis of the appropriate number of horses including: actual use, utilization, current year's production, annual precipitation, Assessment, Inventory, Monitoring (AIM) data, Ecological Site Descriptions (ESDs), and soil survey data. The handbook also recommends using 3-5 years of data. This AML calculation considers previous AML evaluations and incorporates data from 2007 through 2021.

AML Definition

The AML is expressed as a population range within which WH&B can be managed for the long term, and includes an upper and lower limit. The AML upper limit is the maximum number of WH&B which results in a TNEB and avoids deterioration of the range. AML lower limit is the number that allows the population to grow (at the annual population growth range) to the upper limit over a 4–5-year period, without any interim gathers to remove excess WH&B (H-4700-1, BLM 2010).

According to the Wild Horse and Burro Handbook, an in-depth AML evaluation should be completed when review of resource monitoring and population inventory data indicates the AML may no longer be appropriate. H-4700-1 identifies three main factors to consider when evaluating AML including 1) changes in environmental conditions, 2) presence of any newly listed threatened, endangered, or sensitive species, and 3) any additional resource monitoring, population inventory, or other relevant data collected since the AML was established. These factors are discussed in greater detail below.

Environmental Conditions

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Refer to the PMWHR Rangeland Health Assessment document for an in-depth analysis on rangeland conditions and trends on the wild horse range (Appendix B). The overall conclusion being that the monitoring data consistently show that plant community composition has shifted dramatically from what is expected in this area. Overuse of the PMWHR has created a change in vegetation community from tall cool season grasses to shorter stature, herbaceous vegetation which is not expected for the Pryor Mountains. The shift from high forage value to low forage value species indicates that the plant community is altered in ways that are not beneficial for grazing or ecological function. The vegetative viability and production have been diminished and can be seen by weakened plants and nutrient reserves, and plants with shallow root systems. The continual over utilization has led to a diminished state at the PMWHR which should continue to worsen without intervention. Over time, the range has become dominated by less desirable vegetation and has seen a dramatic shift in species composition.

The Natural Resource Conservation Service (NRCS) estimates that this area should receive between 10-19 inches of precipitation per year, with lower elevations receiving lower amounts. However, the actual precipitation records are routinely at the low end of the range, indicating that the PMWHR may be subject to drought conditions. Drought conditions along with heavy utilization rates can have an extremely negative impact on forage quality and quantity as well as affecting land health status. The AML Calculation Report section shows the wild horse numbers and forage utilization rates at Key Management Areas (KMAs) across the horse range; annual precipitation data is also included. A KMA is a relatively small portion of a range selected because of its location, use or grazing value as a monitoring point. It is assumed that key areas, if properly selected, will reflect the overall acceptability of current grazing management over the range.

Threatened and Endangered Species (TES) and Sensitive Status

There are five BLM sensitive status plants within the PMWHR.

1) Cary's Beardtongue (*Penstemon caryi*) is regionally endemic of the Bighorn and Pryor mountains of north-central Wyoming and south-central Montana. The species habitat is stony, calcareous soils in Douglas-fir forests, juniper woodlands, sagebrush steppe from the montane to lower subalpine zone. Potential threats to the species is habitat loss due to encroaching anthropogenic activities, such as limestone quarrying and road construction (Appendix B).
2) Shoshonea (*Shoshonea pulvinate*), which is also a USFS Species of Conservation Concerns, is regionally endemic to the Absaroka and Owl Creek Mountains of northwest Wyoming and adjacent Montana. The species habitat is open, exposed limestone outcrops, ridgetops, and canyon rims, in thin, rocky soils. A trend report completed in 2016 for the species on the PMWHR noted that the species was not negatively impacted by wild horses or native ungulates over a span of 25 years (Appendix B).
3) Pryor Mountain Bladderpod (Lesica's Bladderpod)(*Physaria lesicii*) is endemic to the Pryor Mountains, Carbon County, Montana. This species occurs in two distinct vegetation types. The first is woodlands with a sparce overstory of Rocky Mountain juniper and/or mountain mahogany, and widely scattered Douglas-fir. These woodlands are typically found on moderate to steep, usually warm slopes at the lower elevation limits of Douglas fir (5300-6300 feet). The second habitat is in bluebunch wheatgrass-cushion plant fellfields, with the dominant graminoids being bluebunch wheatgrass, Sandberg bluegrass, and junegrass. Low forbs usually dominate these habitats, which are usually on open, south-facing, gentle slopes of exposed ridge crests

surrounded by forests of Douglas-fir and limber pine. A report completed in 2019 concluded that horse trampling resulted in an 18 percent loss of this species for the Sykes Ridge population. Population declines for the Big Coulee population were not attributed to horse trampling (reason for decline is unknown). There was no apparent threat for the Mystery Cave population (Appendix B).

4) Thick-leaf Bladderpod (*Physaria pachyphylla*) is regionally endemic occurring only in the Pryor Mountain Desert of south-central Montana and in the Big Horn Basin of north-central Wyoming. The species habitat in Montana is dry, barren, and stony, yet edaphically diverse soils in the Pryor Mountain Desert which occur on exposed slopes, ridges, and valleys. This species is limited to pinkish or reddish soils derived from limestone or a combination of limestone and diatomaceous earth at elevations ranging from 1,300 to 1,600 meters above sea level. Current and potential long-term threats to thick leaf bladderpod are gypsum mining, invasive species, and recreation (Appendix B).
5) Big Horn Fleabane (*Erigeron allocotus*) is regionally endemic of the Bighorn and Pryor ranges and adjacent foothills in north-central Wyoming and south-central Montana. The species habitat is stony, sparsely vegetated, limestone or calcareous sandstone-derived soil of exposed ridges and cliffs in the valleys and montane zone. There has been no documentation and/or observation of a decline in trend data of this species and its habitat. Potential threats have not been identified (Appendix B).

Resource Monitoring

The BLM should consider any additional resource monitoring population inventory or other relevant data collected since the AML was established. The monitoring data that has been collected and used in this evaluation report include: Actual horse numbers,[1] forage utilization, 17 indicators of rangeland health, proper functioning condition assessments, forage production, long-term trend data, vegetation cover transects, soil and site stability monitoring, and Assessment, Inventory, and Monitoring (AIM) protocols.

AML Calculation Report

The following two sections showcase two different methods for calculating the AML for the horse range. BLM is presenting Method 1 for comparison purposes only as it was originally utilized in the AML re-calculation report and Land Health Assessment that was signed in November of 2016. While BLM is not relying on the results of this report for its current AML re-calculation, it does provide historical context for the AML calculation under a different method. Method 2, as described in more detail below, is the only method that BLM is relying on for the current AML calculation.

Method 1 calculates the maximum AML based on actual horse numbers and utilization (**Table 5**) and corrects this using a yield index to account for precipitation averages (**Table 6**). The appropriate stocking rate compared utilization analysis against the crop yield index outlined by Sneva et.al, 1983 in the AML Recalculation Report (BLM December 2016).

Tier one and two of the Wild Horses and Burros Handbook outlines a suite of considerations when determining AML. Tier 1 considers

[1] Actual horse numbers do not include 2021 foals, and only include horses that are one year or older.

determining whether the four essential habitat components (forage, water, cover and space) are present in sufficient amounts to sustain healthy WH&B populations and healthy rangelands over the long-term; and, tier 2 considers determining the amount of sustainable forage available for WH&B use. Method 2 calculates AML on the prevalent ecological sites used by horses based on current conditions and forage production estimates compared to expected production on those sites under Historic Climax Plant Communities as described in the 2021 PMWHR rangeland health assessment

Method 1: Using Actual Horse Numbers, Utilization Data, and Precipitation Data (for historical purposes only)

Actual Horse Numbers on Range

Actual wild horse numbers for the PMWHR for the years 2007 through 2016 is shown in **Table 1** below:

Table 1: Actual wild horse numbers from 2007 to 2016

Year	Population on Range	Population living off range	Actual Use
2007	154		154
2008	130	40	130
2009	156	39	156
2010	139	11	139
2011	166	0	166
2012	170		170
2013	145		145
2014	159		159
2015	172		172
2016	160		160
Average	155		155

While not included in the "Method 1" AML calculation report of Section 2, the following **Table 2** confirms the increase of horse numbers since 2016. The population growth has occurred even as the Billings Field Office has implemented fertility control measures.

Table 2: Actual horse numbers on the range from 2017 to 2021

Year	Population	Removals	Mares Fertility Control Treated
2017	165	0	61
2018	154	0	51
2019	168	0	47
2020	168	0	44

2021	178	0	69

Forage Utilization

Forage utilization data was collected using the key forage plant species/landscape appearance methods from 2007 through 2016, the results are depicted in **Table 3** below. The table also depicts use patterns of wild horses during that time frame by KMA, According to the monitoring method used light use is defined as 21-40% utilization, moderate use is 41-60% utilization, Heavy is 61-80% utilization, and severe is 81-100% utilization. The 2016 AML re-calculation report and land health assessment noted that reliable water is a limiting factor in the mid elevation ranges, and that water availability may be a reason for low utilization in this area.

Table 3: Forage utilization from 2007 to 2016

Year	Observed Forage Utilization by Percent at KMA and Inventory Units						
	Forest Service (C-17)	Burnt Timber (C-18	Penn's (C-19)	Britton Spring (C-20)	Big Coulee (C-21)	National Park (C-23)	Overall Utilization Rating for Years across Use Areas
2007	10, light	45, (46) Moderate	70%, Heavy	10, 72, 42, Moderate	86, 34 Severe	40, (56)	Heavy
2008		2 Light		62, 48 Mod/Heavy		64, (62) Heavy	Heavy
2009				74, 66, (62) Heavy	22, 25, 50 Light	(38) Light	Moderate
2010	54, 60, 54 Moderate	50, 58, (52) Moderate	64, (50) Heavy	62, 48, 34, (34) Moderate	62, 58, 78 Heavy	58, 54, 40, (24) Moderate	Moderate
2011	66 Heavy	74, (64) Heavy	89, (72) Heavy	58, 83, (68) Heavy	82 Heavy		Heavy
2012	66 Heavy		56, 82, (68) Heavy				Heavy
2013	56 Moderate	(51) Moderate		62, 90, (84) Heavy			Heavy
2014	48, 41 Moderate	28, (10) Light	76, (58) Heavy		10, (42)		Moderate
2015	50, 82, 64, 60 Heavy	(49) Moderate	62, (60) Heavy	68, 52, (84) Heavy	60, (64) Heavy	70, 30, (22) Moderate	Heavy
2016	(53) Moderate	48, (44) Moderate	(82) Heavy	(91) Severe	(75), 59 Heavy	12 Light	Heavy
Overall Rating for use Area	High Mod/Heavy	Moderate	Heavy	Heavy	Heavy	Moderate	

Year	Observed Forage Utilization by Percent at KMA and Inventory Units						
	Forest Service (C-17)	Burnt Timber (C-18	Penn's (C-19)	Britton Spring (C-20)	Big Coulee (C-21)	National Park (C-23)	Overall Utilization Rating for Years across Use Areas
Across Years							

The following map depicts the location of the KMA plots on the horse range corresponding to the forage utilization data:

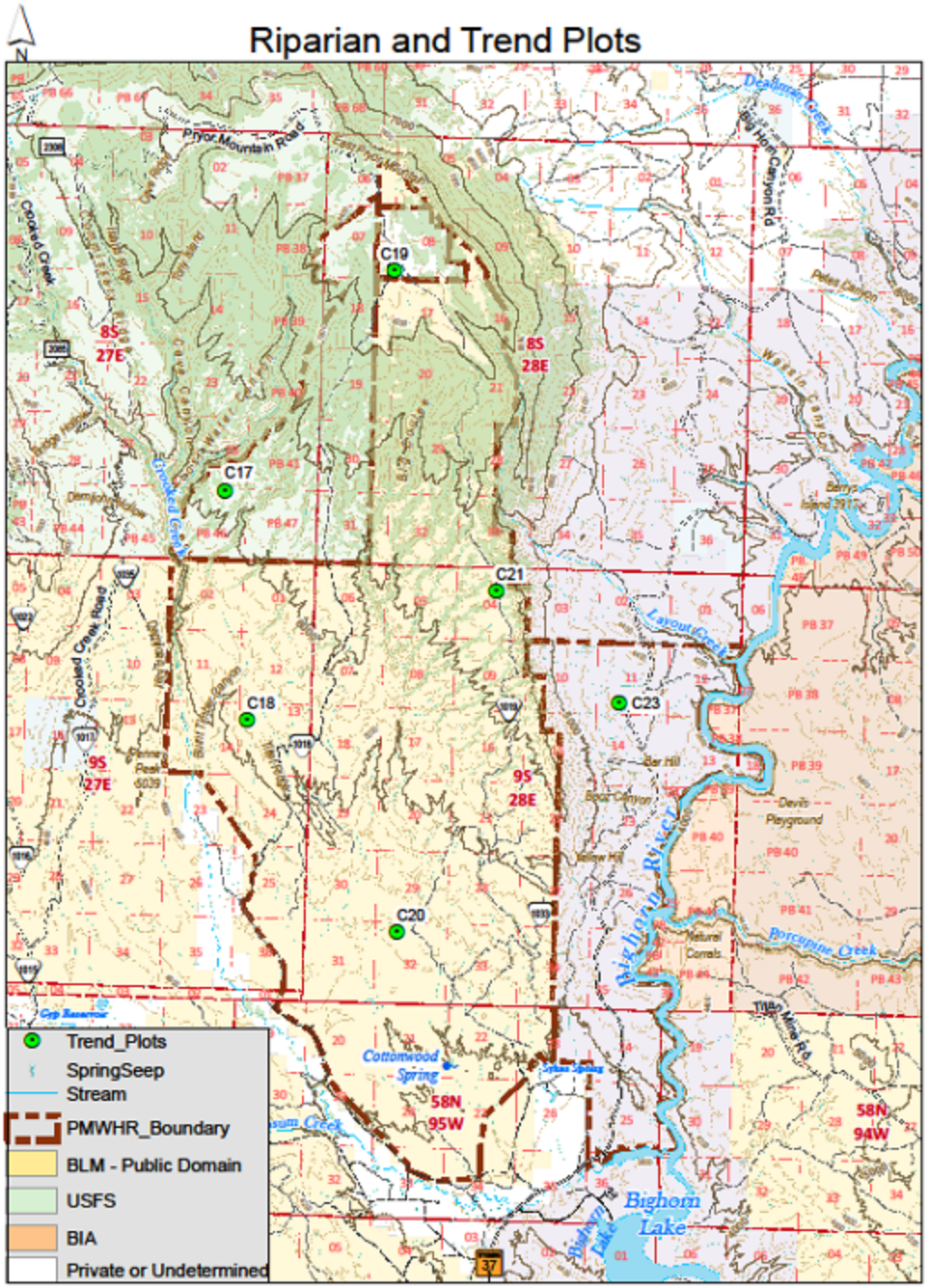

Figure 1: KMA Plot Locations

Precipitation Data and Climate

Data from the National Oceanic and Atmospheric Administration Weather Stations located at Lovell, Wyoming and Bridger, Montana was used to analyze precipitation patterns and climate descriptions for the PMWHR, since this is reflective of precipitation patterns for the south and north ends of the PMWHR.

Precipitation data, which is a function of climate, was used to calculate a yield index for each year (Sneva et al. 1983). The yield index was used to adjust the utilization levels for above or below normal precipitation (compared to long term average). In calculating the yield index, the first step is to calculate the crop yield (effective precipitation). This includes precipitation falling from October through September in the PMWHR. The crop yield is then divided by the normal crop yield (long term average) to determine the precipitation index for each year. The yield index is then calculated using the linear regression equation Y= -23 + 1.23x, where Y is the yield index and x is the precipitation index. **Table 4** shows the yield indices for the analysis years.

Table 4: Forage yield indices from 2007 to 2016

Year	Crop Yield Lovell/Bridger	Precipitation Index Lovell/Bridger	Yield Index Lovell/Bridger
2007	6.60/12.37*	1.05/1.04	106/105%
2008	6.37/11.52*	1.01/0.96	101/96%
2009	4.29/9.57*	0.61/0.80	61/75%
2010	5.45/10.14*	0.84/0.82	84/82%
2011	9.19/11.33*	1.46/0.95	157/94%
2012	3.03/5.13*	0.48/0.43	36/30%
2013	5.76/12.87*	0.92/1.09	90/111%
2014	5.82/12.91*	0.93/1.09	91/111%
2015	4.99/10.10*	0.79/0.85	74/81%
2016	7.76/9.72*	1.24/9.72	129/78%

*30-year crop average for Lovell, Wyoming is 6.28 inches and 11.85 for Bridger Montana

Carrying Capacity Calculation Based on Utilization, Actual Horse Numbers, and Precipitation Data

Carrying capacity was calculated using two formulas as follows:

Actual utilization-based calculation on **Table 5**:
Actual Use/Measured Utilization % = Proper Stocking Level/Desired Utilization (45%)[2]

Corrected utilization-based calculation on **Table 6**:
Actual Use/Corrected Utilization % = Proper Stocking Level/Desired Utilization (45%) [3]

[2] Desired utilization is based off the allowable use level as identified in the PMWHR HMAP from the NRCS recommended objective to maintain the range.
[3] Value from utilization was corrected using the precipitation yield index described in Table 4.

In order to determine the AML of wild horses for properly maintaining the PMWHR the following calculations indicate calculated carrying capacity.

Table 5: Proper carrying capacity using utilization on the PMWHR

Year	Utilization	Wild Horse Actual Use	Proper Carrying Capacity*
2007	70%	154	99
2008	62%	130	94
2009	66%	156	106
2010	62%	139	101
2011	83%	166	90
2012	66%	170	116
2013	84%	145	78
2014	58%	159	123
2015	84%	172	92
2016	91%	160	79

*Calculated using 45% desired utilization

The average number of horses based on actual utilization over the 10-year period is 98. Based on monitoring data using measured utilization the maximum number of wild horses is 98 year-round, which is the maximum number that can be maintained without damage to the range and achieve a thriving natural ecological balance.

Table 6 accounts for reconciling proper use levels using the highly utilized areas in correlation to the high value of the yield index that is indicative of use patterns as identified in Table 5 (Forage Utilization).

Table 6: Carrying capacity using corrected utilization

Year	Utilization	Yield Index	Corrected Utilization	Wild Horse Actual Use	Proper Carrying Capacity*
2007	70%	106%	74%	154	94
2008	62%	101%	63%	130	93
2009	66%	75%	50%	156	140
2010	62%	84%	52%	139	120
2011	83%	157%	100%	166	74
2012	66%	36%	24%	170	318
2013	84%	111%	93%	145	70
2014	58%	111%	64%	159	112
2015	84%	81%	68%	172	114

2016	91%	129%	100%	160	72

*Calculated using 45% desired utilization using measured utilization and adjusted as per yield index from precipitation

The average number of horses under Proper Carrying Capacity using this calculation over the 10-year period is 121. Based upon monitoring data corrected for precipitation by the yield index, an AML of 121 adult wild horses is the maximum number that can be maintained without damage to the range and achieve a thriving natural ecological balance.

These re-calculations of the appropriate management level indicate an AML of 98 or 121 wild horses. Table 5 shows the actual utilization with the number of head grazing during those years. To achieve a 45% utilization rate, the average herd size is 98. Table 6 factors in precipitation yield index (production compared to the long-term precipitation average during the growing season) and calculates a number of 121 horses to achieve 45% utilization if the average precipitation is reached every year. The AML range of 98 to 121 horses represents the number of horses that could graze the PMWHR based on the current utilization calculation (98) and the corrected utilization calculation (121) to stay within the 45% utilization objective.

Method 2: Carrying Capacity Calculation Based on Rangeland Health and Pounds of Production (method actually utilized)

The following AML evaluation is based on monitoring data, ecological site data, and use areas of the PMWHR and is the method being relied upon for calculating the AML. The Billings Field Office completed the PMWHR Rangeland Health Assessment between 2021-2022 and summarized the monitoring data that has been collected on the horse range. The data included 17 indicators of rangeland health, Rangeland Analysis Platform, and Assessment, Inventory, Monitoring (AIM) data, which was collected at forty locations across the horse range from 2017 to 2021. AIM data was located at random locations across the horse range to represent a more robust data set for the ecological indicators. The AIM data was used to characterize conditions on the major Ecological Sites across the PMWHR and compare observed conditions to healthy conditions described by the respective ESDs. Refer to the PMWHR Rangeland Health Assessment for a more detailed assessment of conditions across the horse range (Appendix B).

In order to preserve the free roaming behavior of wild horses on the PMWHR, the BLM manages grazing intensity by adjusting the AML. Managing other aspects of grazing use such as timing or frequency of grazing periods is difficult without interior fences. Interior fences would allow more intensive management of timing, frequency, duration, and intensity of grazing; similar to most livestock grazing systems, however increased fencing does not preserve the free roaming behavior of wild horses.

In the 2009 HMAP, the BLM established a range management objective to limit utilization levels (grazing intensity) on key forage plant species to 45 percent throughout the PMWHR to make significant progress towards meeting standards for rangeland health. BLM carried this objective forward across all alternatives considered in the Pryor Mountain HMAP revision EA.

In order to sustain long-term health and productivity of rangelands, prolonged periods of heavy grazing over extensive areas are not recommended as these conditions will contribute to a decline in rangeland productivity and create conditions that are highly departed from reference conditions (see Appendix B). Holecheck and Galt (2000) categorize heavy grazing as 51 to 60 percent use of forage by weight (anything over 61 percent is categorized as severe).

Attainment of specific use levels is impractical on a year over year basis due to variations in climate, but a 45 percent utilization objective targeted across the 10-year time period for this HMAP revision is

expected to improve trends in rangeland health and productivity on the PMWHR. BLM realizes that utilization may be heavier in drought years when production is low but may be lighter during wet years when production is higher. Holecheck and Galt (2000) further recommend immediate managerial changes (reduction in numbers) any time grazing falls into the severe category on one third or more of a range unit, and that heavy use year after year in the same key areas should be avoided.

A 40% utilization rate was used to calculate allowable forage utilization for wild horses, allowing 5% use by other animals on the range. Extensive modeling is not available to definitely determine the amount of AUMs consumed by horses compared to other herbivore species, but the BLM assumes approximately 5% of the 45% utilization objective accounts for the dietary overlap between mule deer, elk and bighorn sheep with wild horses. The main wildlife species across the horse range are bighorn sheep, deer, elk, upland game birds, black bear, and migratory birds.

A 1.25 Animal Unit Month (AUM) conversion factor was used in the AML calculation for the horse range. An AUM is defined by Holechek et. al (2001) as the amount of feed or forage required by one animal unit for one month; an animal unit is a cow/calf pair that would consume 20 lbs. of feed per day. Approximately 2% body weight consumed per day of a 1000-pound cow would equal approximately 608 lbs. per AUM.

Holechek et.al also provide a conversion factor guideline for various range animals based on their body weight and recommend a 1.80 conversion for horses, which is based on a 1200-pound horse consuming 3% of its body weight per day. Forage intake by horses averages about 50% higher than that of ruminants, like cattle. However, the Pryor wild horses are typically smaller than 1200 pounds and the Wild and Horse and Burros Management Handbook (H-4700-1) defines the forage demand of approximately 26 pounds of forage per day for wild horses; or 1.25 more than that of cattle. The smaller body size of the PMWHR horses doesn't support a conversion factor of 1.8. A conversion factor of 1.25 is a more realistic unit of measure based on PMWHR horses' body weight and forage demand and has been the figure consistently used on the range.

Ecological site development, along with climatic conditions and normal disturbances remaining within normal ranges, produces a plant community in equilibrium with these conditions, and that is called the Historic Climax Plant Community (HCPC) for each Ecological Site Description (ESD). Vegetation dynamics on an ecological site includes succession and retrogression, and these exist as state and transitions with that plant community (NRCS, 2021).

The following is a breakdown of the maximum number of horses able to graze on the range and still meet management objectives outlined in the PMWHR Environmental Assessment. The horse numbers are described in context of the dominant ESDs or ESD combinations where there were mixed ESDs in close proximity.

Silty (Si) RRU 46-S 13-19" p.z.

The silty ecological site is located near the Penn's cabin use area, and approximately 1,161 acres are suitable grazing habitat for wild horses. This ecological site is highly departed from the HCPC described in the Ecological Site Description and is instead close to State and Transition Model 6 and 7 described in the ESD. Higher numbered state and transition models indicate further departure from HCPC and less healthy conditions.

The silty ecological sites are the most highly departed within the horse range as is described in the Rangeland Health Assessment (Appendix B). The silty ecological site descriptions concludes that these sites currently have extremely limited forage production, and usually produce less than 250 lbs/acre, when describing these degraded plant communities. The large decline in production is due to the fact that this community is absent of many of the tall to mid cool season bunchgrasses and is dominated by short grasses such as prairie junegrass and Sandberg bluegrass, and weedy forbs. Mid seral grasses such as

western wheatgrass and needleandthread can still be relatively common in this community, although those species were not recorded in recent monitoring plots. The following **Table 7** describes the calculation for wild horse animal units allocated for this ecological site and associated use area.

Table 7: Current carrying capacity of the silty range site on the PMWHR

Total pounds forage	40% use (available forage)	AUMs available	Horse AUMs (1.25 conversion)	# Horse Animal units (Yearlong)
(250 lbs./a)(1,161 acres) = 290,250	(290,250)(.40) = 116,100	116,100/608 = 191 AUMs	193./1.25 = 153 aums	153/12 (months) = 13 total horses

Limy (Ly) RRU 46-S 13-19" p.z.

The limy ecological sites represent one of the heavier used areas of the horse range and consists of approximately 9,625 acres of suitable grazing habitat for horses. These sites produce approximately 200 lbs. of forage per acre across the horse range and was used to calculate the stocking rate for the usable acres of this ecological site. Forage production data collected in 2004 by the Natural Resource Conservation Service, and again by the Billings Field Office in 2019 were used to formulate the production of this ecological site. Supplemental information through Daubenmire trend plots and Assessment, Inventory, Monitoring (AIM) data were also used to confirm production of this site, by providing percent cover and composition of key forage species. The following **Table 8** describes the calculation for wild horse animal units allocated for this ecological site and associated use area.

Table 8: Carrying capacity of the limy ecological site

Total pounds forage	40% use (available forage)	AUMs available	Horse AUMs (1.25 conversion)	# Horse Animal units (Yearlong)
(200 lbs./a)(9,625 acres) = 1,925,000 lbs.	(1,925,000)(.40) = 770,000 lbs. available	770,000/608 = 1266 AUMs	1266 AUMs./1.25 = 1013 AUMs	1013/12 (months) = 84 total horses

Stony (St) RRU 46-S 13-19" p.z.

The Stony site is intermingled with the silty site in the Penn's Cabin use area and similar in terms of vegetation dynamics and ecological condition and so 250 lbs./acre was also used for this area, same as the silty ecological site, approximately 624 acres of suitable grazing habitat. The following **Table 9** describes the calculation for wild horse animal units allocated for this ecological site and associated use area.

Table 9: Carrying capacity of the stony ecological site

Total pounds forage	40% use (available forage)	AUMs available	Horse AUMs (1.25 conversion)	# Horse Animal units (Yearlong)
(250 lbs./a)(624 acres) = 156,000 lbs. forage	(156,000)(.40) = 62,400 lbs. available	62,400/608 = 103 AUMs	103 AUMs./1.25 = 82 AUMs	82/12 (months) = 7 total horses

Limy (Ly) RRU 46-S 13-19" p.z., Shallow (Sw) RRU 46-S 13-19" p.z.

The Limy and Shallow mix of ecological sites is located between Sykes and Burnt Timber Ridge and the Penn's cabin use area. The site is used as a travel corridor between the higher elevations of Penn's Cabin

and the lower elevation of Sykes Ridge and Burnt Timber. The acreage of slopes greater than 45% were not used in the stocking rate of this ecological site because of the minimal to no-use those areas would receive by wild horses. Grazing animals will use the more convenient flat areas, such as valley bottoms, riparian zones, and ridgetops, when grazing rough, rugged terrain. In 2004 the NRCS collected forage amounts at four different monitoring plots, and three of those were used for an average of 70 lbs/acre across these sites. One of the sites was an outlier to the other three and was not used in the calculation; the outlier location recorded only 21 lbs/acre. In total, 3,631 acres were found to be grazeable within this site when factoring in percent slope. The following **Table 10** describes the calculation for wild horse animal units allocated for this ecological site and associated use area.

Table 10: Carrying capacity of the limy and shallow mix of ecological sites

Total pounds forage	40% use (available forage)	AUMs available	Horse AUMs (1.25 conversion)	# Horse Animal units (Yearlong)
(70 lbs./a)(3,631 acres) = 254,170 lbs. forage	(254,170)(.40) = 101,668 lbs. available	101,668/608 = 167 AUMs	167 AUMs./1.25 = 134 AUMs	134/12 (months) = 11 total horses

Shallow Clay (SwC) RRU 58A-C 11-14" p.z.

The Shallow Clay ecological site is on the Wyoming side of the horse range boundary and contains about 778 acres of suitable habitat for wild horse grazing. This site most closely resembles the Limy ecological site described above but receives less precipitation on average. As such, this site produces less forage which was verified by forage production clipping and monitoring data. The NRCS in 2004 conducted forage utilization studies and found that this area produces around 150 lbs. per acre which is still accurate and verified by recent AIM and Rangeland Health Assessment monitoring. The following **Table 11** describes the calculation for wild horse animal units allocated for this ecological site and associated use area.

Table 11: Carrying capacity of the shallow loamy ecological site

Total pounds forage	40% use (available forage)	AUMs available	Horse AUMs (1.25 conversion)	# Horse Animal units (Yearlong)
(150 lbs./a)(778 acres) = 116,700 lbs.	(116,700(.40) = 46,680 lbs. available	46,680/608 = 77 AUMs	77 AUMs./1.25 = 62 AUMs	62/12 (months) = 5 total horses

Total AUM and Number of Head Calculation, Method 2

Table 12 below summarizes the total number of head based on the ecological sites used by horses on the PMWHR, and described individually in the tables above:

Table 12: Total AUM and Number of Head for Method 2

Ecological Site .	**AUMs/Number of horses**
Silty (Si) RRU 46-S 13-19" p.z.	153 AUMs/13 horses
Limy (Ly) RRU 46-S 13-19" p.z.	1013 AUMs/84 horses
Stony (St) RRU 46-S 13-19" p.z.	82 AUMs/7 horses
Limy (Ly) RRU 46-S 13-19" p.z**.**, Shallow (Sw) RRU 46-S 13-19" p.z**.**	134 AUMs/11 horses
Shallow Clay (SwC) RRU 58A-C 11-14" p.z.	62 AUMs/5 horses

Total	**1444 AUMs/120 horses**

Summary

AML calculation methods indicate Under the current calculations of method 2 the results show that a maximum of 120wild horses can graze the PMWHR without further deteriorating the rangeland and achieve Thriving Natural Ecological Balance (TNEB) as described in the Wild Horse and Burro Handbook. The information and rationale were based on long term monitoring data, resource conditions, forage production clipping, climate data in relation to expected conditions, and terrain. The Wild Horse and Burro Handbook states that the lower limit of the AML shall normally be established at a number that allows the population to grow (at the annual population growth rate) to the upper limit over a 4–5-year period, without any interim gathers to remove excess WH&B. Each alternative of the EA includes fertility control measures, and the Billings Field Office has documented that the population of horses has increased by 13 over the past five years, having already administered fertility control annually over that time span. Using the maximum calculated upper limit AML of 120 horses and reducing that by the herd growth of 13 over the past 5 years, the lower limit would be 107 horses, resulting in an AML range of 107 to 120 horses.

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