Broadscale Land Health Evaluation and Categorization Cover Sheet

May 2022

IDT Recommendations:

- 1) **Categorization**: Based upon this assessment, it is recommended that the categories (Allotment Management Status) for the allotments listed in Appendix A remain the same.
- 2) Recommendation: Based on the multiple lines of evidence and information analyzed in the formation of this report, the Standards for Rangeland Health were met on all allotments listed in Appendix A. If future evaluations conclude that one or more Standards are not being met, and significant progress is not being made, a Determination of Causal Factors will be completed. Current livestock grazing management and other uses will be evaluated to identify causes of any unsatisfactory conditions. This document does not constitute a decision but provides the basis for the Miles City Field Office Manager to make their determination on whether or not existing grazing management practices or levels of grazing use on public lands are significant factors in failing to achieve the standards and conform to the guidelines for livestock grazing management. The field manager will finalize the determination document just prior to issuing the proposed grazing decision on the associated allotment.

I have considered the Interdisciplinary Teams recommendations and determined:

Land Health Standards are:	Met 🛛	Not Met 🗆	
		Acting Field Manager	5/18/2022
Authorized Officer		Title	Date

Broadscale Land Health Evaluation Report

May 2022



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Table of Contents

Executive Summary	3
Chapter 1: Introduction to the Evaluation Report	5
1.1 Policy Requirements and Process	5
1.1 Background and Related Resources	6
1.1.1 Introduction	6
1.1.2 Soils	9
1.1.3 Ecological Sites and Grouped ESDs	12
1.1.4 Vegetation	17
1.1.5 Historical Influences	
1.1.6 Climate	19
1.1.7 Fire History and Fuels	19
1.1.8 Visual Resources	21
1.2 Special Designations	23
1.3 Authorized Uses	23
1.3.1 Livestock Grazing	23
1.3.2 Recreation and Travel	24
1.3.3 Minerals	24
1.3.4 Oil and Gas	25
1.3.5 Right-of-Ways	25
Chapter 2: Standards	25
2.1 Format for Standards	25
2.2 Uplands	27
2.2.1 Procedures to Determine Conformance with Standards	27
2.2.2 Affected Environment	28
2.2.3 Vegetation	28
2.2.4 Analysis and Findings	
2.2.5 Recommendations for Uplands	54
2.3 Riparian and Wetland Areas	55
2.3.1 Procedures to Determine Conformance with Standard	55
2.3.2 Affected Environment	59
2.3.3 Analysis and Findings	62

2.3.4 Recommendations for Riparian	63
2.4 Water Quality	63
2.4.1 Procedure to Determine Conformance with Standard	63
2.4.2 Affected Environment	64
2.4.3 Analysis and Findings	64
2.4.4 Recommendations for Water Quality	65
2.5 Air Quality	65
2.5.1 Procedure to Determine Conformance with Standard	65
2.5.2 Affected Environment	66
2.5.3 Analysis and Findings	66
2.5.4 Recommendations for Air Quality	66
2.6 Habitat	67
2.6.1 Procedure to Determine Conformance with Standard	67
2.6.4 Recommendations for Habitat	83
2.7 Conclusion and Next Steps	85
Chapter 3: Additional Information	86
Glossary of Terms	87
References and Literature Cited	91
Appendices	
Appendix A: Grazing Allotments	A1
Appendix B: Montana Noxious Weed List	B1
Appendix C: RAWS Precipitation	C1
Appendix D: Indicator Data for all Plots in Zones by Ecological Site	D1
Appendix E: Preferred Forbs	E1
Appendix F: Montana DEQ Water Quality and PFC determination	F1

Executive Summary

The Bureau of Land Management's (BLM) Miles City Field Office (MCFO) assessed and evaluated 1,372 grazing allotments (of 1,822 MCFO total) for conformance with fundamentals of rangeland health (FRH). The allotments comprise 1,483,101 acres of BLM administered lands within the Field Office (Figure 1). This evaluation report documents the status of resource conditions on these lands according to standards for rangeland health (land health standards). Most allotments covered in this assessment were last assessed for land health standards in 1999 or 2000. The MCFO allotments not covered in this report have been assessed individually due to larger proportions of public lands and/or resource needs.

Public lands were assessed for conformance with the 5 Standards applicable to the MCFO: Upland Health, Riparian Health, Water Quality, Air Quality, and Habitat for native plants and animals. These are further described below. The preamble of handbook H-4180-1 - Rangeland Health Standards states: "The purpose of the standards and guidelines at Title 43 Code of Federal Regulations (CFR) §4180 is to provide a measure (standard) to determine land health, and methods (guidelines) to improve the health of the public rangelands. Success will be measured in concrete outcomes on the lands we manage."

BLM grouped the assessed grazing allotments into 30 management zones spread across the MCFO. The management zones were developed to aid assessment of upland and habitat information and aid prioritization for future administration and assessment. These zones were developed based on similar soil types, vegetation characteristics, climate, and scales (see Figures 1 and 3). Using fifth level Hydrologic Unit Code boundaries for assessment scale is unfeasible in the Northern Great Plains and the MCFO since that watershed scale is so large and the land ownership pattern does not lend itself to assessing or administering grazing allotments at that scale. A combination of quantitative and qualitative data sources and modeling were used to assess conformance with the Standards at the allotment, management zone, or assessment area scales. Methods are described further under the respective sections.

The BLM prioritizes the review of lands authorized under grazing permits/leases, in particular to determine if modification of permit/lease terms and conditions is necessary prior to renewal. In setting workload priorities, precedence for review is given to existing permits/leases in these areas not meeting land health standards and those containing riparian areas, including mesic meadows. The BLM may use other criteria for prioritization to respond to urgent natural resource concerns (e.g., fire) and legal obligations.

Recommendations for modifications to existing use authorizations, restoration actions, and monitoring to address resource concerns identified in the assessment document, will be reviewed, and analyzed in accordance with the National Environmental Policy Act of 1969 (NEPA).

Based on the monitoring, modeling, and other information, resource conditions were found to be generally satisfactory across public lands in the 30 management zones in the MCFO. Proper functionality of upland vegetation communities and soils conditions is being maintained or improved with present grazing prescriptions and the riparian areas are in proper functioning condition with present grazing management. Habitat is provided for native plant and animal populations and communities. Currently authorized activities were not contributing to water quality nor air quality degradation. The evaluation found consistent conditions across all 30 management zones; namely that uplands and riparian areas are in proper functioning at risk condition or functioning at risk with an upward trend. Suspected causal factors for localized functioning at risk conditions include non-native vegetation species (crested wheatgrass, Japanese brome, and cheatgrass), vegetation departure from simulated historical reference (vegetation condition class), noxious weeds, natural disturbances of riparian vegetation communities, or historic grazing use.



Figure 1: Map of management areas, also called management zones for the broadscale assessment

Chapter 1: Introduction to the Evaluation Report

1.1 Policy Requirements and Process

This Evaluation Report (ER) describes the health of public lands administered by the Bureau of Land Management (BLM) in the established management zones within the Miles City Field Office. The ER will describe resource conditions for each management zone. Any lands assessed in the future and found to not be meeting land health standards will require an Authorized Officer's Determination of Causal Factor(s) (Determination), and appropriate action (National Environmental Policy Act (NEPA) document(s) and subsequent decision) will follow to adjust management or implement projects/treatments as needed to ensure continued conformance with the Standards.

In 1995, Fundamentals of Rangeland Health (FRH) were incorporated into the grazing regulations under 43 CFR §4180. The FRH directed BLM to develop rangeland health Standards at the state or local level, that, at a minimum, provide for the four fundamentals of rangeland health as defined in the regulations. Applicable Montana/Dakotas Standards for Rangeland Health and Guidelines for Livestock Grazing Management (Standards) were submitted to the Secretary of the Interior and were approved August 12, 1997 (43 CFR §4180 2(b)).

There are five Standards for the MCFO. They outline the BLM's rangeland management goals for the betterment of the environment and sustained productivity of the range. The Standards are described below and are incorporated into the Miles City Field Office Approved Resource Management Plan (ARMP).

Standards are statements of physical and biological condition or degree of function required for healthy sustained lands. Achieving or making significant progress towards achieving these functions and conditions is required of all uses of BLM administered lands as stated in 43 CFR 4180.1. The standards applied depend on the resources on a given piece of land.

Conformance with the five MCFO Standards means:

- 1. <u>Uplands</u> are in proper functioning condition. Soils are stable and provide for physical and biotic environments (water infiltration and runoff, ground cover, and plant associations) as appropriate for the relevant ecological site(s).
- <u>Riparian</u> areas and wetlands are in proper functioning condition. Riparian-wetland areas have adequate vegetation, landform, or large woody debris present to dissipate stream-energy associated with high waterflows, thereby reducing erosion and improving water quality. Hydrologic, erosion deposition, and vegetation characteristics contribute to a system in balance with its setting.
- 3. <u>Water quality</u> meets Montana state water quality standards. Surface and ground water support designated beneficial uses described in the Montana Water Quality Standards.
- 4. <u>Air quality</u> meets Montana state standards. Air quality helps meet the goals set out in the State of Montana Air Quality Control Implementation Plan. BLM management actions or use authorizations do not contribute to air pollution that violates the quantitative or narrative Montana Air Quality Standards or contributes to deterioration of air quality in selected class areas.
- 5. <u>Habitats</u> are provided for healthy, productive, and diverse native plant and animal populations and communities. Habitats are improved or maintained for special status species (federally threatened, endangered, candidate or Montana species of special concern).

In order to assess the Standards, the MCFO conducts Rangeland Health Assessments (Assessment(s)) in conformance with 43 CFR §4180 and the Montana/Dakotas Standards for Rangeland Health and

Guidelines for Livestock Grazing Management. This Evaluation Report serves as the Assessment and is a synthesis of data and information available for the assessment area, and describes the historic and current management, activities, and natural disturbances influencing conditions within the assessment area.

This ER also identifies the areas where each standard applies, describes the current conditions relevant to each applicable standard, and examines changes or trends in rangeland health over time for each applicable Standard.

Upon evaluation of the assessment data, the authorized officer determines if existing grazing management practices or levels of grazing use on BLM administered lands are significant factors in failing to achieve one or more of the five Standards. If a standard or standards are not met, the BLM is required by regulation (43 CFR 4180.1) to make grazing management adjustments.

Alternative management is considered wherever it is determined that:

- specific grazing allotments are not meeting the Standards, or
- allotments are meeting the Standards but have site specific resource concerns

The Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Montana, North Dakota, and South Dakota (May 1997) and the MCFO Approved Resource Management Plan (ARMP) (September 2015), will be used to guide management decisions.

Decisions affecting grazing management will be issued in accordance with the federal grazing regulations (43 CFR §4160). Decisions to authorize other activities will be made through the appropriate process or through a Decision Record after NEPA analysis.

1.1 Background and Related Resources

1.1.1 Introduction

The 30 management zones encompass parts of 17 counties in eastern Montana. Table 1 shows acres and percentages of BLM lands in each Management zone. By working at management zone scale, a broader landscape is considered, and more consistent management can be applied. It is the BLM's intent to implement management actions cooperatively with permittees and public land users. Any changes proposed for livestock management would be implemented through grazing decisions that address allotments or groups of allotments with a common permittee.

The MCFO administers approximately 1,687 permits and leases held by ranchers who graze livestock, mostly cattle and sheep, at least part of the year on 1,822 MCFO grazing allotments. Permits and leases generally cover a 10-year period and are renewable if the BLM determines that the terms and conditions of the expiring permit or lease are being met.

There are 849 allotments, representing 62% of the allotments in the assessment area where less than 50% of the forage in the allotment is produced from public lands. There are 509 allotments representing 38% of the allotments in the assessment area where most of the forage within the allotment is produced from public lands. Within the project area there are approximately 9,436,300 acres. Of these acres, 1,483,101 acres are BLM-administered land (Figure 2). This represents approximately 15.7% of the area. This report addresses only the public lands administered by the BLM. There are also 486,200 acres (5.2% of the area) administered by the Montana Department of Natural Resources and Conservation (DNRC) and 7,468,537 acres (79.1% of the area) of privately owned lands. The last assessments completed on the allotments within the project area were completed in 1999 and 2000.

Management was changed on any allotments found not meeting land health standards in 1999 and 2000, and those allotments have since been re-evaluated and are not covered in this report.

Management Zone	Acres	Percent of Project area
Plains	217,254	15%
Rosebud	122,335	8%
Dry Arm	112,930	8%
Haxby	98,825	7%
Mizpah	86,741	6%
Unglaciated	79,568	5%
Crow Creek	61,541	4%
Cherry Creek	58,314	4%
Glaciated	52,611	4%
Little Powder River	46,371	3%
Cottonwood Creek Rd	44,599	3%
Missouri Breaks	41,506	3%
Glendive	40,822	3%
Wildhorse	39,650	3%
Knowlton	36,455	2%
Plevna	36,450	2%
Cedar Creek	33,946	2%
Ridgeway Ridge Rd	29,786	2%
Ridge	29,441	2%
Cache Creek	27,227	2%
Belle Creek	27,172	2%
Indian Creek Rd	25,592	2%
Brackett Creek	22,185	2%
CB Grazing District	21,949	1%
Powderville Rd	21,574	1%
Mildred	17,297	1%
Bickerdyke Rd	12,584	1%
Decker	9,518	1%
Finger Buttes	9,421	1%
East Musselshell	5,132	<1%
Total	1,468,796	100%

Table 1: BLM lands per Management Zone

Figure 2: Overview map of land ownership in the Miles City Field Office; purple represents BLM land within the assessment areas.



1.1.2 Soils

Soils typically found in the MCFO are Mollisolls and Entisols. These soils in the field office area are derived from soft, sedimentary bedrock (sandstone, siltstone, and shale), local and regional alluvium, and a small amount of glacial till. The complex and diverse soil patters vary in character and productivity. Soil groups have unique capabilities and limitations based upon parent material, climate, topography, and soil properties. Typical land uses across public lands in the assessment area are grazing. Wildlife such as mule deer, sage grouse, pheasants, and antelope are common on uncultivated grasslands.

Soil types in the project area were identified from the NRCS's Soil Survey Geographic (SSURGO) data set and the Web Soil Survey (WSS) website. Soil surveys were performed by the NRCS according to National Cooperative Soil Survey (NCSS) standards and were conducted at the third order of detail. Pertinent information for review and analysis is from the Web Soil Survey (WSS) for the project area. This soil information is used to determine soil suitability and/or limitations for any applied management action.

Major Land Resource Areas

Major Land Resource Areas (MLRA) are a broad-scale unit in the NRCS soils classification system. MLRAs are geographically associated land resource units characterized by a certain pattern that combine soils, water, climate, vegetation, land use, and type of farming. They are characterized by the dominant physical and climate characteristics for the geographical area and include many ecological sites. Approximately, 74% of the surface acres managed by the BLM in the project area are in MLRA 58A (Northern Rolling High Plains, Northern Part) and 16% BLM acres are in MLRA 60B (Pierre Shale Plains, Northern Part). A minimum number of surface acres in the MCFO's extreme eastern area of responsibility occur in MLRA 54 (Soft Shale Plains, East), MLRA 58C (Northern Rolling High Plains, Northeastern Part), 58D (Northern Rolling High Plains, Eastern Part), and MLRA 60A (Pierre Shale Plains). The northern end of the field office boundary some acres fall in MLRA 52 (Brown Glaciated Plains) and MLRA 53A (Northern Dark Brown Glaciated Plains) see Figure 3 and Table 2.



Figure 3: Major Land Resource Areas in the Assessment Area

MLRA Number	MLRA Name	Total MLRA Acres	Percent of BLM administered land within MLRA
58A	Northern Rolling High Plains, Northern Part	1,096,361	73.9%
60B	Pierre Shale Plains, Northern Part	234,328	15.8%
53A	Northern Dark Brown Glaciated Plains	41,640	2.8%
58B	Northern Rolling High Plains, Southern Part	34,660	2.3%
60A	Pierre Shale Plains	22,371	1.5%
58D	Northern Rolling High Plains, Eastern Part	17,143	1.2%
54	Rolling Soft Shale Plain	15,113	1.0%
52	Brown Glaciated Plain	14,667	1.0%
58C	Northern Rolling High Plains, Northeastern Part	6,590	0.4%
	Total:	1,482,873	100%

Table 2: Major Land Resource Areas in the Landscape Assessment Area

¹ BLM acknowledges discrepancy in acreage calculations due to the differences in land classifications between NRCS soils data and surface ownership data.

The Northern Rolling High Plains, Northern Part (58A) area is in the Missouri Plateau, Unglaciated, Section of the Great Plains Province of the Interior Plains. It is an area of old plateaus and terraces that have been eroded. Slopes are generally, gently rolling to steep, and wide belts of steeply sloping badlands border a few of the larger river valleys. Local relief is mainly 10 to 100 feet (3 to 30 meters). In some areas flat-topped, steep-sided buttes rise sharply above the general level of the plains. Elevation generally ranges from 2,950 to 3,280 feet (900 to 1,000 meters), increasing from east to west and from north to south. In a few mountains, it is as high as 6,900 feet (2,105 meters). This area supports grassland vegetation that includes western wheatgrass, bluebunch wheatgrass, green needlegrass, and needleandthread as dominant species. In the eastern part of the area, little bluestem replaces bluebunch wheatgrass as the dominant species (USDA, 2006). The Northern Rolling High Plains, Northern Part (58A) contains the majority of the Silty Loamy and the Shallow ESD Groups described below.

Pierre Shale Plains, Northern Part (60B) area is also in the Missouri Plateau, Unglaciated, Section of the Great Plains Province of the Interior Plains. It is an area of old plateaus and terraces that have been deeply eroded. Elevation ranges from 2,950 to 3,300 feet (900 to 1,005 meters) on uplands. The shale plains have long, smooth, gentle to strong slopes. Slopes along drainageways and streams are moderately steep or steep. This area supports mixed natural prairie vegetation characterized by western wheatgrass, green needlegrass, and blue grama. Little bluestem and sideoats grama grow on shallow soils. Slopes are generally gently rolling to steep with areas of steeply sloping breaks and badlands bordering the larger streams. Marine and continental sediments of the Cretaceous Montana Group underlie this MLRA and include: Bearpaw shale; Judith River sandstone, siltstone, and shale; Claggett shale; Eagle sandstone; and Telegraph Creek sandy shale. Soils are mostly fine textured, and shallow to moderately deep (from 10 to over 40 inches). They are generally well drained with mixed or clay

mineralogy and can be loamy and sandy where high sandstone ridges occur (USDA, 2006). Inclusions of acidic shale are found within this MLRA that, in places, because of acidic conditions, have created sandy-textured soils that support diverse plant populations including lower elevation pine forests (Heinze, 1987). In certain areas, these soils can have severe erosion hazards and have poor restoration or reclamation suitability because of the occurrence of steep and very steep slopes (greater than 20% slope) and extreme physical properties such as high clay content, slow permeability, shallow depth, and sparse vegetative ground cover. Soils are generally low in organic matter and high in sodium and soluble salts. Precipitation ranges from 8 to 22 inches and the climate is dominantly semiarid. Dominant land uses in this MLRA are livestock production and non-irrigated croplands. Mining and oil production occur in relatively small volumes but are important land uses in some areas. The Pierre Shale Plains, Northern Part (60B) contains the majority of the Clay Based ESD Group described below.

1.1.3 Ecological Sites and Grouped ESDs

Ecological sites (ES) are more detailed and site-specific land-type classifications that describe ecological potential and ecosystem dynamics of land areas. All land/land use types are identified within the ecological site system, including rangeland, pasture, and forest land. An ecological site is defined as a distinctive kind of land with specific soil and physical characteristics that differ from other kinds of land in its ability to produce a distinctive kind and amount of vegetation and its ability to respond similarly to management actions and natural disturbances. Lands are classified by considering discrete physical and biotic factors. Physical factors include soils, climate, hydrology, geology, and physiographic features. Biotic factors include plant species occurrence, plant community composition, annual biomass production, wildlife-vegetation interactions, and other factors. Ecological dynamics, primarily disturbance regimes—such as grazing, fire, drought, management actions, and all resulting interactions—are also a primary factor of ecological sites. Fundamental to the ecological site concept is their direct association with soil map unit components of the NRCS National Cooperative Soil Survey. Within the NRCS hierarchical system of classifying landscapes, the ecological site is the most basic unit on which land health is assessed.

Information and data pertaining to an ecological site is organized into a reference document known as an Ecological Site Description (ESD). ESDs function as a primary repository of ecological knowledge regarding an ecological site. ESDs are maintained on the NRCS <u>Ecological Site Information System (ESIS)</u>, which is the repository for information associated with ESDs and the collection of all site data. In general, an Ecological Site Description uses biotic and abiotic factors to describe the range of possible plant communities that could occur on a site and provides a standard reference for land manager decisions.

The number of ESDs and their distribution within MLRAs and across the MCFO is extremely diverse. As a result, the MCFO has grouped ESDs that have similar characteristics to aid in evaluation and management decisions. Below are the group descriptions. Figure 4 shows distribution of the grouped ESDs.

Table 3: Grouped Ecological Site in the Project Area

Grouped Ecological Site	BLM Acres	% of BLM Project Area
Silty/Loamy	515,980	35%
Clay-based	423,852	29%
Shallow	193,419	13%
Badland (landscape type, not ESD)	141,577	10%
Sands/Gravel	114,131	8%
Saline	44,986	3%
Other	47,618	3%
Totals	167,383	100%

¹BLM acknowledges discrepancy in acreage calculations due to the differences in land classifications between NRCS soils data and surface ownership data.



Figure 4: Map of the Grouped Ecological Sites across the Miles City Field Office

Silty/Loamy Grouped

The Silty/Loamy Grouped ESD includes the Silty, Loamy, and Silty-Steep ecological sites. Bare ground within the reference state should be less than 20% for Silty or Loamy sites and less than 25% on Silty-Steep sites. Litter cover ranges from 40-50% on Silty-Steep sites and 40-60% on the other two sites. The reference plant community (by weight) has cool season, bunchgrasses as the dominants on these sites with warm season grasses either a co-dominant on the Silty-Steep sites or subdominant on the other two sites. Cool season rhizomatous grasses are subdominants for all sites. Forbs are subdominants on all sites while shrubs are a sub-dominant on the Silty-Steep and a minor component of the other sites. Overall shrub cover ranges from a trace to 1% on Silty and Loamy sites to 5-10% on Silty-steep.

A disturbance-induced community would see an increase in less desirable, short stature grasses (Sandberg bluegrass, prairie junegrass, needleleaf and threadleaf sedge, and blue grama), reduced plant litter, and an increase in invasive plants (plains prickly pear cactus, broom snakeweed, fringed sagewort, and annual bromes). Bare ground amount is usually minimal. Lesser club moss and blue grama can be extensive, at times greater than 50% of the canopy cover.

Clay-Based Grouped

The Clay-based Grouped ESD includes the Clayey, Clayey-Steep, Shallow Clay, Claypan, Dense Clay, Thin Clayey (Provisional), Shale, and Course Clay ecological sites. Bare ground within the reference state should be less than 20% for Clayey, less than 35% for Clayey-Steep, less than 40% for Claypan and Shallow Clay, less than 50% for Coarse Clay, less than 60% for Dense Clay, and less than 75% for Shale. Litter cover expected would range from a low of 5% or greater on the Shale sites to 35-60% on the Clayey sites. The reference plant community (by weight) has native cool-season mid- and taller grasses, followed by shrubs with lesser amounts of forbs. For all these ecological sites, generally, the plant community would be grass dominated with a lesser component of shrubs, most often Wyoming big sagebrush, and even fewer forbs. Overall shrub cover would range between a low of 1-5% on Clayey sites and 2-10% on Claypan sites to a high of 20-25% for Dense clay sites. Other sites are intermediate at 5-10% for Clayey-steep, and Coarse clay and 10-15%.

A disturbance-induced community for these ecological sites would see an increase in less desirable, shorter stature grasses (Sandberg bluegrass and prairie junegrass), an increase in bare ground, reduced plant litter, and an increase in earlier successional plants (plains prickly pear cactus, broom snakeweed, fringed sagewort, and annual bromes).

Shallow Grouped

The Shallow Grouped ESD includes the Shallow, Very Shallow, Shallow Loamy, and Thin Silty (old Range Site name) ESDs. Bare ground within the reference state should be less than 50% on the Very Shallow (VSw) ecological site and less than 30% on the other sites. Litter cover ranges between 15-40% on the VSw sites and 15-40% on the other sites. The reference plant community (by weight) for these sites would expect to be dominated by cool and warm season mid-stature bunchgrasses. The sub-dominant community for the sites except the VSw, is a mid-stature rhizomatous cool and warm season, and shorter stature grass species. The VSw site would have a co-dominant shrub community with the

grasses. On all other sites in the group the shrubs would be expected to be less dominant than the warm season grass species. Overall shrub canopy ranges from 10-15% on Shallow sites to 15-25% on Very Shallow sites.

Badlands

Badlands is a Landscape term within the USDA-NRCS National Cooperative Soil Survey Program's Geomorphic Description System. It is used to describe a landscape which is intricately dissected and characterized by a very fine, high density drainage network with short, steep slopes and narrow interfluves. Badlands have little to no vegetation and developed on unconsolidated or poorly cemented materials (clays, silts, or in some cases sandstones) sometimes with soluble minerals such as gypsum or halite. Within the Miles City Field Office area these landscapes make up 10% of the surface area and are common within the project area.

Sand/Gravel Grouped

The Sand/Gravel Grouped ESDs include the Sands, Sandy, Sandy-Steep, Gravel, and Shallow to Gravel ESDs. Bare ground within the reference state should be less 20% cover for Sandy and Sands, less than 35% for Sandy-steep, less than 10% for Gravel, and less than 50% on Shallow to Gravel site. On the Gravel sites expected bare ground is low due to 50-70% of the soils surface at these sites are covered in rock fragments. Higher litter cover averages can be expected on the Sands and Sandy sites (40-65%), while Sandy-Steep ranges from 15-25%, Gravel is 15-40%, and Shallow to Gravel is 20-55%. The reference plant community for all sites in this group would expect to be dominated by warm season rhizomatous or bunchgrasses grasses, except for the Shallow to Gravel site where cool season mid-stature grasses are dominant. Cool season mid-stature bunch grasses are the sub-dominant component. Forbs range from 5-50% canopy cover for Sands, Sandy, and Sandy-Steep, while Gravel and Shallow to Gravel sites, and minor components on the Sandy and Shallow to Gravel sites. Overall shrub canopy cover ranges from T-5% on Sandy and Sandy-steep sites, 1-3% on Sands sites, 15-25% on Gravel sites, and 5-50% on Shallow to Gravel sites.

Saline Grouped

The Saline Grouped ESDs includes the Saline Lowland and Saline Upland ESDs. Bare ground within the reference state should be less than 5% on Saline Lowland sites and less than 60% on Saline Upland sites. Litter cover ranges between 25-70% on the lowland sites and 10-30% on the upland sites. For the reference plant community (by weight) on these sites, shrubs are more common than on most other ecological site groups. On the lowland sites the taller warm season grasses (bunch and rhizomatous) are the dominants while the sub dominants are shrubs, cool season mid-stature rhizomatous grasses and warm season mid-stature grasses. Forbs are a minor component. Shrubs and half shrubs along with mid-stature warm season bunch grasses are dominant on the upland sites. Cool season grasses (rhizomatous, bunchgrasses) and warm season mid-stature rhizomatous are sub dominants. Overall shrub cover ranges from 25-70% on the lowland sites to 20-25% on upland sites.

Other

The Other category is for the less common surface area groups within the project area such as, less common ecological sites, river wash, water, etc. The most common ESD within this category is the

Overflow site. Bare ground within the reference state should be minimal and litter 50-60% cover. The plant community should be dominated by cool and warm season grasses, with a small component of forbs and shrubs. Shrub canopy cover typically ranges from 5-10%.

1.1.4 Vegetation

Potential plant communities (Historical Climax Plant Community, HCPC) for all ESDs in the Northern Great Plains landscape developed under typical climatic conditions and the influence of large ungulate defoliation and occasional fire. This area has a dominant herbaceous component of grasses/grass-likes with a lesser amount of forbs. Woody species (shrubs and half shrubs) are typically a smaller component of these communities. Annual production for an individual species or species group can vary greatly between years, depending primarily on precipitation (timing and amount) and temperature. Percent species composition by weight (annual production) across these ecological sites usually ranges from 65 to 80% grasses/grass-likes, 1-15% forbs, and 5-15% woody species. Saline influenced sites typically have a greater percentage of their annual production in the woody species. For instance, the Saline Uplands Ecological Site will typically have up to 35-45% of its annual production in woody species and only 40-50% of the production in grass/grass-likes and 1-5% in forbs.

The herbaceous component of these ecological sites is a mix of both mid-stature and short-stature, cool and warm season grasses. Sites with finer textured soils in the Clay-based and Silty/Loamy groups tend to be dominated by a mix of cool season mid-grasses of western wheatgrass (thickspike wheatgrass), green needlegrass, needleandthread, and bluebunch wheatgrass in areas with more favorable moisture. On sites with coarser soils like those in the Sand/Gravel group, the mix of mid-grasses is similar except needleandthread can be more dominant. Sites with shallow soils commonly have little bluestem. The herbaceous understory is typically composed of various forbs and shorter stature grasses including blue grama, prairie junegrass, buffalograss, and the grass-like threadleaf sedge. Other than blue grama which is quite common throughout the MCFO, other shortgrass species tend to increase in occurrence based on predominate soils type in the upper horizons of the soil profile.

Due to the highly variable annual growing conditions in this part of the Plains, the Historical Climax Plant Community average annual production fluctuates greatly. On sites with poorer quality soil conditions coupled with less favorable moisture years, annual production can be a low of 200 lbs. per acre, while in favorable moisture years the same site could have a high of around 500 lbs. per acre. Sites with improved soils conditions and in areas with greater mean annual precipitation, the annual production can range from a low around 1,500 lbs. per acre to over 3,000 lbs. per acre. However, in the MCFO, over 70% of the ecological sites fall in either the Silt/Loamy Grouped or the Clay-based Group, where the average annual production can range from a low of 200 to 300 lbs. per acre to just over 2,000 lbs. per acre for unfavorable and favorable moisture years, respectively. The overall production across these ecological sites in an average moisture year is around 1,000 to 1,100 lbs. per acre.

Invasive Species Treatment

Leafy spurge (*Euphorbia esula*) is the dominant invasive species in the project area. Leafy spurge is a perennial of serious concern, as it spreads rapidly and is extremely difficult to eradicate once established. Other noxious and weedy species infesting the project area are knapweed species--spotted

(*Centaurea stoebe*), diffuse (*Centaurea diffusa*), and Russian (*Rhaponticum repens*); salt cedar (*Tamarix ramosissima*); hoary cress (*Lepidium draba*); field bindweed (*Convolvulus arvensis*); Canada thistle (*Cirsium arvense*); houndstongue (*Cynoglossum officinale*); and cocklebur (*Xanthium strumarium*). Annual bromes, cheatgrass (*Bromus tectorum*) and Japanese brome (*Bromus japonicus*) also occur sporadically throughout the assessment area.

Using Early Detection Rapid Response, treatment areas are prioritized in publicly accessible areas due to higher traffic use that increase the potential spread of invasive species. Riparian areas are also a high priority area due to the constant seed source from the water movement. It is imperative to control invasive species in these areas to eliminate infestations from appearing further down river. Emergency stabilization and rehabilitation areas are important areas to eliminate weed infestations due to the disturbances that are created from wildland fires. These disturbances open a window of opportunity to treat infestations that were previously occurring and are now weakened from the fire activity. Another priority area is special status species habitat areas. These areas are important to maintain in order for wildlife to flourish in their natural habitat.

1.1.5 Historical Influences

Historically, the Northern Cheyenne, Fort Peck, and Crow tribes occupied the region. Large livestock companies grazed herds on the range throughout the years until the early 1900s. Open range grazing was simply based on "first come, first served." Drought, improper management, and feuds caused many of these organizations to fail or they dissolved and were succeeded by local stockmen and smaller herds. During the era of homesteading, western public rangelands were often overgrazed because of policies designed to promote the settlement combined with a lack of understanding of how to care for these lands. In response to requests from western ranchers, Congress passed the Taylor Grazing Act of 1934 (named after Rep. Edward Taylor of Colorado), which led to the creation of grazing districts. In these districts, grazing use was apportioned and regulated.

At first, livestock management improved, which also slowed the degradation of public rangelands and improvement of watersheds. But during the 1960s and 1970s, the appreciation for public lands and expectations for their management changed. This shift in the approach to land management was made clear by such laws as the National Environmental Policy Act of 1969, the Endangered Species Act of 1973, and the Federal Land Policy and Management Act of 1976.

As a result, the BLM also shifted from managing grazing in general. The agency began to improve the management or protection of specific rangeland resources such as riparian areas, threatened and endangered species, sensitive plant species, and cultural or historical objects. Consistent with this enhanced role, the BLM developed or modified the terms and conditions of grazing permits and leases. The agency also implemented new range improvement projects to address specific resource issues.

Eastern Montana ranchers are largely cow-calf producers, who market about 1 million calves each year. The MCFO manages livestock grazing on 2.7 million acres on a scattered land ownership pattern throughout eastern Montana. The terms and conditions for grazing on BLM-managed lands (such as stipulations on forage use and season of use) are set forth in the permits and leases issued by the BLM to public land ranchers.

Several modifications to the landscape have occurred within the project area resulting from past and

current activities. These include development and maintenance of transportation and communication corridors (railroads, highways, power lines, telephone lines, and fiber optic lines), mining, logging, and range improvement construction and maintenance (fences, reservoirs, pits, developed springs, and wells).

More information regarding the history of this area can be found in Class I Overview of the BLM located in the 2015 Miles City Field Office Approved Resource Management Plan.

1.1.6 Climate

Eastern Montana is typically considered semi-arid with temperature extremes occurring between the summer and winter months. Average annual precipitation ranges from 10 to 20 inches, with the greatest amount occurring in the form of rainfall during May through September. Snow generally falls between November and April. Winter temperatures can be as low as minus 30 degrees F. Temperatures in the summer can reach over 100 degrees Fahrenheit. The average date of the first frost in the fall occurs in mid-September. The average date of last frost is in late May. The growing season averages 115 days, and ranges from 100 days on the Canadian border to 130 days on the Wyoming border. Climate is typical of mid-continental regions with long severe winters and hot summers. Most of the precipitation occurs during late spring and early summer months.

Most of the ecological sites in the MCFO are in the 10-14 inch mean annual precipitation zone but increases to 14-17 inches near North and South Dakota. In the southeast portion of the field office in MLRA 60B may have more favorable soil moisture conditions due to more effective precipitation (timing and amount). Most of the precipitation in MLRA 58A, 58B, 58C, 58D, and 53A typically occurs as rain early in the growing season. MLRA 54 also receives early growing season moisture but can also receive about half of its precipitation as winter snow.

1.1.7 Fire History and Fuels

Wildfire history data for the MCFO has been compiled using geospatial analysis. A total of 2,096 fires (33,487,783 acres) occurred within the project area between 1980 and 2019. Historical Fire Data in the past was often separated into two categories, "The fire was started as the result of human activity" and "The fire started as the result of any type of activity not associated to humans." Only in recent years has the data been assigned more specific categories such as Lightning/Natural, Human-caused, and unknown. The MCFO is unique as we have natural burning Coal Seam fires that are part of the Lightning/Natural Cause category. Since 2011, the data has shown that 165 fires have been caused by Coal Seams. In 2020, there was a total 277 fires within the area; of those fires, 150 were Human-caused, 114 Lightning-caused, 50 were Coal Seam-caused, and the rest were unknown. The MCFO is known for having a very active and intense fire season between the months of June through September but is extended in drought years or years following high vegetation production with extreme summer temperatures.

Two notable fires that have impacted the MCFO are the Ash Creek Fire (2012) and the Lodgepole Complex (2017). The Ash Creek Fire occurred in Powder River and Rosebud Counties and burned 900 BLM acres and 249,713 total acres. Of 900 acres that burned on BLM, 6 allotments were affected (Bringoff Creek Unit, Coates Unit, Mission, Samuelson, Terrett, and Wesco). The Lodgepole Complex occurred in Garfield County and burned 101,761 BLM acres and 270,723 total acres. Of 101,761 acres that burned on BLM, 45 allotments were affected (7-W Allotment, Barney Pinnacle, Black Ranch, Brown – WCSGD, Browning, Calf Creek, D.K. North Pasture, Deep Coulee, Dog Creek, Dry Fork Allotment, Dutton Individual, Ely, Fail Place, Gumbo Ridge, Hailey Coulee, Haley Creek, Hamilton, Kampf, Keith Individual, Kimmel Coulee Allotment,

KL & C Bliss, L-O Ranch, Lodgepole AMP, McWilliams Coulee, Meserve Lease, Musselshell River, O'Connor Ranch, Pense AMP, Peterson – WCSGD, Pierson Allotment, Rich Ranch AMP, Rogge Unit, Ronning Unit, Rowton, Ryan, Sage Hen, Sage Hen Creek, Shaw Allotment, Shawver Allotment, Six-X Allotment, Tin Can, Wagner, West Dry Fork, Wilson Coulee, and Winter Pasture.)

Historically, fire return intervals for the forest ecological systems in the field office were 0-35 years. Fire severity ranges from low to replacement, depending on conditions. Fire suppression for the past century has increased forest stand densities and facilitated conifer encroachment into rangelands. Changes in forest structure and stand density levels have made forests less drought tolerant and more susceptible to insect infestations and disease. These forests are less resilient to high intensity and high severity stand replacement wildfires.

Sixteen prescribed fire projects totaling 21,191 acres have been implemented in the MCFO between 1998 and 2020. Thirty-two forest treatments totaling 17,003 acres have been accomplished through mechanical resources such as hand thinning or mastication. All treatments were done with forest health and fuels reeducation objectives.

The following is a list of the prescribed fire projects, including year implemented and acres treated:

- 6X-7W (1998) 478 acres
- South Breaks (2001) 3,412 acres
- Bliss (2001) 2,798 acres
- H-Cross (2003) 2,328 acres
- Rich North (2004) 2,180 acres
- North Pine (2005) 3,260 acres
- Wildhorse (2011)- 646 acres
- Rich West (2014) 1,828 acres
- Bobcat (2015)- 349 acres
- Keystone (2015) 397 acres
- Rich North West (2017) 390 acres
- Pine Ridge (2019) 1,427 acres
- Howrey Island Piles (2020) 54 acres
- Rockwell RX (2020) 603 acres
- Pine Ridge South-wildfire (2020) 409 acres
- Pine Ridge South (2020) 632 acres

For forested areas, Fire Regime Condition Class (FRCC) is used to evaluate the degree of ecological departure from historical, or reference condition, vegetation, fuels, and disturbance regimes. Reference conditions describe historical seral stages, vegetation patterns, and fire regimes. FRCC uses reference conditions to define pre-settlement landscapes. This is the baseline against which current conditions are compared. FRCC assessments determine how similar a landscape's fire regime is to its natural or historical state (USDI, 2011). There are three FRCC categories.

- Condition Class 1:
 - Low Departure (4% and 52,133 acres in project area)
 - Good Ecological integrity
 - Contain vegetation patterns and disturbance regimes characteristic of the natural fire regime

- Condition Class 2:
 - Moderate Departure (94 % and 1,325,724 acres in project area)
 - Declining ecological integrity
 - Landscapes are those that are moderately departed from the natural fire regime
- Condition Class 3:
 - High departure (2% and 26,028 acres in project area)
 - Poor ecological integrity
 - Landscapes reflect vegetation and disturbances that are uncharacteristic of the natural fire regime

Within the project area, 4% totaling 52,133 acres is in Condition Class 1 (Low Departure), 94% totaling 1,325,724 acres is in Condition Class 2 (Moderate Departure), and 2% totaling 26,028 acres in the project area is considered to be in Condition Class 3 (High Departure).

Typically, moderate and high vegetation departures are indicative of a lack of disturbance across the landscape and is a factor the IDT and authorized officer considers whether an area not meeting the Upland health Standard.

Fire has played an important role as a disturbance factor. Disturbance from wildfire and planned prescribed fire can be described using fire regime groups. Fire regime is a description of the patterns of fire occurrences, frequency, size, severity, and sometimes vegetation and fire effects in each area or ecosystem. Fire regime groups help to determine natural disturbance frequency in an ecosystem. These disturbance events help maintain important landscape ecological processes and provide for diversity and distribution in age classes of vegetation. In general, properly functioning ecological systems within the project area have a range of age classes that would increase overall biodiversity while allowing the systems to be more resilient to large-scale disturbance.

Fuels and vegetation management indicators are used to examine the current health of native plant communities for the project area. Due to the modelling resolution of the geospatial data, it is inappropriate to use fire regime group data at the allotment level, but rather to use it as a landscape level indicator of watershed health. General inferences can then be made regarding vegetation condition and management treatments needed across allotment boundaries within the project area. Between all data gathered and analyzed, an overall picture of land health in the project was assessed in the context of the upland standard.

1.1.8 Visual Resources

The objective of Visual Resource Management (VRM) is to manage public lands in a manner which will protect the quality of the scenic (visual) values of those lands. The VRM objectives are established in conformance with land use allocations. The VRM objectives are area specific and provide visual standards for project, designing, and evaluating proposed development projects. Proper implementation of VRM helps prevent environmental degradation and maintain important resource values.

There are three Visual Resource Management classes within the project area. The VRM classes and their corresponding management objectives are as follows:

Class II – The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Class III – The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Class IV – The objective of this class is to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic landscape elements.

1.1.9 Climate Change and Grazing

Livestock grazing can affect rangeland carbon levels through changes in plant community and ecosystem processes, but the effects have been variable and inconsistent among the ecosystems studied (Derner and Schuman, 2007). In particular situations, grazing can increase carbon storage as one study found when comparing to no grazing (Follett et al., 2001); mechanisms behind increased soil carbon was due to increased plant turnover and changes in plant species composition. Stocking rates and grazing systems are also an important factor for soil carbon, while soil carbon can increase under moderate grazing, heavy grazing can decrease soil C (Liebig et al., 2010).

Changes in rangeland carbon from various grazing practices do not ordinarily result in substantial changes in total ecosystem carbon, but rather the distribution of carbon is redistributed, such as from above-ground vegetation carbon to carbon stored in root biomass (Derner and Schuman 2007). Overall, changes in rangeland carbon storage from grazing practice alterations are likely to be small and difficult to predict, especially where a rangeland health assessment has determined that rangeland health standards are being met. Therefore, any changes in grazing analyzed following this assessment would only result in negligible, if any, change in total carbon storage in both the short and long term.

Approximately 161,891 active Animal Unit Months (AUMs) of grazing are currently authorized each year on public lands within the assessment area. Approximately 10% of the livestock forage consumed annually from all lands in the Miles City Field Office comes from public lands. Assuming an average production of 8 kilograms of methane gas per AUM (EPA 2016) and assuming methane has a global warming potential 21 times more than carbon dioxide (EPA 2020), each AUM equals 0.168 metric tons of carbon dioxide (CO₂). This level of grazing would result in 27,198 metric tons of CO₂ equivalent in greenhouse gas (GHG) emitted each year from livestock use within the grazing allotments contained in this assessment. For comparison purposes 25,000 metric tons of CO₂ equivalent a year is approximately 0.0000041 of 1 percent of total annual national emissions of 6 billion metric tons. Total global emissions are approximately 25 billion metric tons each year. Based on the above information, greenhouse gas emissions from the level of grazing on public lands in the allotments contained in this assessment would be negligible or even undetectable. Many ecological implications associated with climate change. Ecological consequences of climate change will vary substantially among biogeographic regions and within those regions (Polley et al., 2013). It was predicted in the Northern Great Plains precipitation will increase and with rising atmospheric CO₂ will potentially increase forage production (McCollum et al., 2017). However, plant species composition may change to favor warmer season species over cool season species. Climate change could modify the composition to favor exotic species (Polley et al., 2013).

In addition to increased annual trends of temperature and precipitation, data from (1970-2015) on the Northern Great Plains indicates seasonal changes to timing of precipitation and temperature (Bromely et. al., 2020). The Bromely et. al. study found the Northern Great Plains largely followed annual average global climate trends with the notable exception of May and June, which trended cooler and wetter.

There are many knowledge gaps when predicting site specific effects of climate change on public lands in the assessment area. Consequently, monitoring and adaptation to maintain healthy rangelands meeting land health standards will be necessary. Regular trend monitoring of resource conditions on allotments including weather and soil moisture by the Montana Mesonet, scheduled long term vegetation community and soils monitoring, and other studies required by the Miles City ARMP will reveal any disturbances to the ecosystem such as drought, insect infestations, or shifts in vegetation composition caused by climate change. This systematic monitoring and assessment of observable conditions will supplement information based on climate projections and more effectively provide critical and specific information needed to adaptively manage rangelands under uncertain climate futures (McCollom et al., 2017). The BLM has the authority under the grazing regulations to adapt authorized grazing rapidly to respond to drought, insects, fire, etc. if conditions warrant action. Also, the BLM can adapt terms and conditions to permitted grazing use to ensure grazing practices do not jeopardize meeting land health standards if climate change causes some unforeseen shifts in environmental conditions.

1.2 Special Designations

Areas of Critical Environmental Concern: There are no Areas of Critical Environmental Concern (ACEC) within the project area, but ACECs within the field office are the Ash Creek Divide, Bug Creek, Hell Creek, Sand Arroyo with designated for paleontological reasons. The Big Sheep Mountain, Jordan Bison Kill, Seline, and the Reynolds Battlefield ACEC are designated for cultural reasons. The Smoky Butte and Finger Buttes are designated for Scenic and Geology reasons, management strategies within this ACEC focus on mitigating impacts to resources from surface-disturbing activities.

1.3 Authorized Uses

1.3.1 Livestock Grazing

The project area includes 1,372 grazing allotments over 1,483,101 acres of BLM administered land. The grazing allotments provide spring, summer, and fall forage for livestock. There are 161,891 Animal Unit Months (AUMs) of allocated livestock forage on the BLM administered lands within the allotments. Cattle—mature individuals or cow/calf pairs—are the primary type of livestock authorized to graze on the allotments. Project allotment information can be found in Appendix A.

Livestock grazing allotments were assigned a management category during the development of resource management plans. All grazing allotments in the Miles City Field Office have been categorized as either Improve (I), Maintain (M), or Custodial (C) based on resource values, opportunities for improvement,

and the BLM's level of management. Allotment categorization is also used to establish priorities for distributing available funds and personnel during plan implementation to achieve cost-effective improvement of rangeland resources. Improve (I) category allotments are managed more intensively and are monitored more frequently. Maintain (M) category allotments are usually at a desired ecological condition and are managed to maintain or improve that condition. Custodial (C) category allotments are generally isolated parcels where BLM administered land is a small part of the grazing unit, there is limited or no public access, the land consists of primarily secondary range and/or it has few resource concerns. These small allotments are managed in conjunction with the permittee/lessee's normal livestock operations and generally monitored less frequently. Sixty-six allotments within the project area are categorized as "I" allotments, 443 allotments are "M" allotments, and 849 are "C" allotments. Appendix A summarizes the grazing allotment information.

The BLM has worked cooperatively with individual livestock permittees/lessees for many years to develop grazing systems that prescribe grazing management to maintain or improve natural resource conditions. Of the 1,372 BLM administered allotments within the project area, 258 allotments are managed with specified grazing schedule. The remaining allotments are category C, custodial use allotments, where management inputs are minimal because of the small proportion of public land or inaccessibility of the area to livestock in the allotments. See Appendix A for the allotments with specified grazing schedules. This report does not recommend any changes to allotment categories.

1.3.2 Recreation and Travel

Very little of the BLM lands within the project area have public access. The BLM lands with public access provide a wide range of recreational opportunities including camping, sightseeing, hiking, wildlife watching, and hunting. Participation in specific recreational activities varies with the season of use.

1.3.3 Minerals

Locatable minerals are those minerals for which a mining claim can be staked. There is very low potential for locatable minerals such as gold, chromium, titanium, zeolite, and associated minerals such as copper, lead, and zinc in the MCFO and high potential for bentonite. The Mining Law of 1872, as Amended (30 U.S.C. 22 et seq.) provides for the exploration, discovery, and mining of metallic and certain non-metallic minerals on federal lands. Exploration and mining activity on most BLM-administered lands are subject to the regulations found in 43 CFR 3809. Mining activities require the submittal of a plan of operations that includes a mining and reclamation plan as well as a description of all essential measures to prevent the unnecessary and undue degradation of the land.

Bentonite clay is the major locatable mineral, occurring in the Cretaceous Belle Fourche and Mowry formations within the Powder River Basin. These deposits, located in southern Carter County near the town of Alzada, have been extensively mined by two companies. Bentonite also occurs in other Cretaceous rocks, such as the Hell Creek formation and Bearpaw shale. Bentonite is exposed along the Missouri River as far downstream as Brockton on the Fort Peck Indian Reservation, and along the axis of the Cedar Creek Anticline from Baker to Glendive.

Federal mineral materials consist of sand and gravel used for road surfacing and construction projects. These mineral materials are dispensed in the best interest of the public while providing for reclamation of mined lands and preventing unnecessary degradation of non-mineral resources. Mineral materials in the MCFO consist primarily of clinker, sand, and gravel (with small amounts of petrified wood, agate, and building stone). Mineral materials occurring on public land are reserved to the government and the land patented under the Stock Raising Homestead Act (30 U.S.C. 54 and 43 U.S.C. 299).

Coal is another notable mineral in the MCFO; there are approximately 10,924,000 BLM-administered coal acres. Currently, five surface mines produce coal; four of the mines are within the Tongue River member of the Fort Union formation which in the Powder River Basin. This area contains large coal deposits, much of which is administered by the federal government. The coal is sub-bituminous in rank.

1.3.4 Oil and Gas

Since the early 20th century, oil and gas development has been occurring in the MCFO, which consists of approximately 5 million acres of BLM-administered oil and gas mineral estate. There are two main production areas, the Williston Basin (which includes the Cedar Creek Anticline, Poplar Dome, Williston Basin northeast, and all remaining areas within the basin) and the Powder River Basin. The northeast Williston Basin and Cedar Creek Anticline areas are two of the most active oil and gas producing regions in Montana and coalbed natural gas development has made the Powder River Basin one of the largest natural gas producing regions in Montana.

Federal oil and gas leasing authority is found in the 1920 Mineral Leasing Act, as amended, for public lands and the 1947 Acquired Lands Leasing Act, as amended (30 United States Code [U.S.C.] 351 et seq.), for acquired lands. Leasing of federal oil and gas is affected by other acts such as the Wilderness Act of 1964, NHPA, National Environmental Policy Act of 1969 (NEPA), ESA, FLPMA, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (30 U.S.C. 226 et seq.) Regulations governing federal oil and gas leasing are contained in 43 CFR 3100 with additional requirements and clarification found in onshore operating orders and Washington Office manuals and instruction memorandums.

BLM Montana/Dakotas conducts quarterly oil and gas lease sales, as required by the Mineral Leasing Act of 1920, as amended, and the Mineral Leasing Act for Acquired Lands of 1947, as amended, when eligible lands are available for leasing. Lease sales are held on a quarterly basis to allow field offices sufficient time to conduct an environmental analysis. Two oil and gas lease sales are held at the Montana State Office each year involving tracts under the jurisdiction of the MCFO.

1.3.5 Right-of-Ways

A right-of-way (ROW) is an authorization to allow for the use, operation, maintenance, and termination of a facility, such as electric power/fiber optic lines, communications site, road, canal, pipeline (water, oil, gas), or irrigation ditch on BLM lands. ROWs across public lands are generally authorized under Title V of FLPMA and Section 28 of the Mineral Leasing Act (43 CFR 2800 and 2880 and 30 U.S.C. 181 et seq.) or pursuant to U.S.C. Title 23, Section 317 for highways under the Federal Aid Highway Act of 1958 (August 27, 1958, as amended). In areas in which ROWs are granted, terms and conditions and stipulations are used to protect resource values.

Chapter 2: Standards

2.1 Format for Standards

Available trend monitoring data, existing inventories, historical photographs, and standardized methodology are used by the Interdisciplinary Team (IDT) to assess condition and function of BLM administered lands. This information, including technical references, BLM policy and procedure

handbooks, and monitoring guidelines and methodologies are available for review at the Miles City Field Office. Technical references and BLM procedural handbooks are also available at the BLM Library website (<u>https://www.blm.gov/learn/blm-library</u>).

Land Health Standards are met when all five standards are met or are making significant improvement towards being met. In order to assess each standard, several indicators are analyzed. Indicators are physical and biological factors and processes that can be measured and/or observed in the field. No single indicator provides sufficient information to determine whether an area is meeting the standard(s), and indicators considered must be appropriate for the standard and location to which they are applied. The indicators listed below each standard are not intended to be all-inclusive, and the issue of scale must be considered when evaluating each indicator. In some cases, individual isolated sites within a landscape may not be meeting the standards, but broader areas must be in proper functioning condition. Furthermore, fragmentation of habitat that reduces the effective size of large areas must also be evaluated for its consequences.

Conclusions reached in this evaluation describe all the factors, indicators, and the scientific basis for each conclusion. The evaluation rationale contains descriptions of each indicator that contributes to allotment(s) meeting or not meeting the standards.

If data sources contributing to evaluating if management zones are meeting Standards indicate any allotment or area within that management zone may not be meeting a Standard, then the individual allotment or area will be assessed separately. If data sources indicate no issues with meeting Standards at smaller scales than the management zone, then all allotments within management zones will be considered meeting the Standards.

The Upland, Riparian, Air Quality, and Water Quality Standards will follow the format:

- Procedures to Determine Conformance with Standards This section describes how the resources are determined to be meeting or making significant progress towards meeting the standards.
- Affected Environment This section briefly describes the area and resources that were assessed.
- Analysis and Findings This section describes and/or evaluates the status of indicators in relation to standards (4181 Manual, Page 4-107). This can include review of assessment data and monitoring data.
- Recommendations This section presents initial recommendations developed by the IDT during the assessment.

Because of the complexities involved with addressing the Habitat Standard, the Affected Environment, and the Analysis and Findings sub-sections are presented for each resource with an allotment conclusion summary and recommendations presented at the end.

The standards are assessed on an allotment scale, with the exceptions of Air Quality, which is made at the watershed level and Habitat, which is made at multiple scales as indicated in that section.

The initial recommendations developed by the IDT during field assessments contained in this report are designed to improve land health, including upland and riparian/wetland health, water quality, forest/woodland health, conserving/restoring high priority species, and/or enhancing habitat within the project area. The recommendations focus primarily on livestock management, forest and woodland

treatments, sagebrush steppe treatments, riparian and stream restoration, and wildlife and fisheries habitat restoration. Other BLM administered public land resources, concerns, uses, and designations addressed in the project area includes, fire and fuels management, noxious weeds, and invasive species.

2.2 Uplands

Miles City Standard #1: "Uplands are in proper functioning condition."

2.2.1 Procedures to Determine Conformance with Standards

Uplands are defined as land at a higher elevation than the alluvial plain or low stream terrace; all lands outside the riparian-wetland and aquatic zones (USDI, 1996). The functioning condition of uplands is influenced by soils, vegetation, hydrologic function, and biotic integrity (USDI 1994). Miles City Field Office Standard #1 Uplands are in proper functioning condition when, "soils are stable and provide for capture, storage, and safe release of water appropriate to soil type, climate, and landform. The amount and distribution of ground cover for identified ecological sites or soil-plant associations are appropriate for soil stability. Ecological processes including hydrologic cycle, nutrient cycle, and energy flow are maintained and support healthy biotic populations. Plants are vigorous, biomass production is near potential, and there is a diversity of species characteristic of and appropriate to the site (USDI, 1997)." Uplands are functioning at risk when a soil, water, or vegetation attribute makes them susceptible to degradation and lessens their ability to sustain natural biotic communities (USDI 2001). Non-functioning uplands are defined as a condition in which vegetation and ground cover are not maintaining soil conditions that can sustain natural biotic communities (USDI 2001).

Two sets of information coupled with professional knowledge were used by the IDT to assess the uplands. The first was the Rangeland Analysis Platform (RAP) model output and the second was field-collected plot level data: Assessment, Inventory, and Monitoring Strategy (AIM) plots from the BLM and the Landscape Management Framework (LMF) plots from NRCS. Due to the number of allotments and vast geographic area covered in this report, the AIM/LMF and RAP data were analyzed at an allotment grouped level rather than the allotment-specific level. These grouped areas were broken into 30 management zones. Zones were identified as areas with discrete geographic boundaries and comprised of multiple watersheds with similar vegetation and hydrologic characteristics. Other variables were also used to develop zones included soil characteristics, habitats, and grazing allotment boundaries. This also allowed the IDT to analyze the data and make comparison statements on similarly characterized environments.

A preliminary investigation was conducted using the Rangeland Analysis Platform online application to detect any medium scale differences in vegetation cover of functional groups or bare ground when evaluated at the management zone scale. The RAP uses LANDSAT imagery, AIM and LMF, and the USDA NRCS's Natural Resource Inventory (NRI) data to derive these estimates (Jones et al., 2018). For the period of 1984 to 2019, the IDT evaluated the vegetation functional group categories of annual forbs plus grasses, perennial forb plus grasses and shrubs. The Team also reviewed biomass production for the same period.

The next step was to review plot level data from AIM and LMF. LMF data are collected by the USDA Natural Resource Conservation Service on BLM administered lands in accordance with the AIM Strategy. AIM and LMF monitoring locations were established and read each year in the project area for 2017-

2020. The IDT evaluated a total of 289 plots and 127 plots fell within allotments analyzed in this assessment, hereby called project allotments.

The AIM Strategy specifies a probabilistic sampling design, standard core indicators and methods, electronic data capture and management, and integration with remote sensing. Attributes include the BLM terrestrial core indicators: bare ground, vegetation composition, plant species of management concern, non-native invasive species, and percent canopy gaps. The objective of the AIM Strategy is to provide a standardized monitoring strategy for assessing natural resource condition and trend on BLM public lands.

Lastly, the IDT included Miles City Field Office long-term trend study data and historic field surveys to further evaluate plot data that indicated an attribute may not be within reference. Data reviewed included photographic records (monitoring, plot, and historical air photos) and monitoring file tabular data for a final decision on conformance with the Upland Standard.

2.2.2 Affected Environment

2.2.3 Vegetation

There are a wide variety of plant communities and ecological systems within the project area that factor into upland health. Plant community composition is influenced by soil type and parent material, effective precipitation, slope, and aspect as well as others such as fire (or lack of fire), historical use, and current management activities. Two different ecological and mapping systems are used to discuss the plant communities in this project, the Montana Ecological Systems and Ecological Site Classification System.

Montana Ecological Systems

First, the Montana Ecological Systems provides a broad scale overview of the plant communities mapped within the Miles City Field Office. As described on the Montana Heritage webpage "Ecological systems are groupings of biological communities occurring in similar physical environments, and influenced by similar ecological processes such as flooding, fire, wind, and snowfall. The ecological system concept was developed to provide a mappable unit that could be classified from aerial or satellite imagery, and that would be easily identifiable in the field by land managers, resource specialists, and planners. Systems typically occur on a landscape at scales of tens to thousands of acres, and generally persist in a recognizable state for 50 or more years."

The Montana Ecological Systems identifies three major ecological systems within the project area: Big Sagebrush Steppe, Great Plains Mixed-grass prairie, and Great Plains Badlands. Additional ecological systems make up minor components of the project area, often intermixed among the major ecological systems. The following information from the Montana Heritage's online Ecological Systems Field Guide for Montana, identifies the number of acres for each System within the project area.

Table 4: Major BLM Ecological Systems within the project Area

Grassland Systems	BLM Acres	Percent Area
Great Plains Mixed-grass Prairie	601,850	45%
Shrubland, Steppe and Savanna Systems	BLM Acres	Percent Area
Big Sagebrush Steppe	587,496	44%
Sparse and Barren Systems	BLM Acres	Percent Area
Great Plains Badlands	68,162	5%
Other	BLM Acres	Percent Area
Other Systems	84,733	8%
Total	BLM Acres	Percent Area
	1,342,241	100%

¹BLM acknowledges a slight discrepancy (<100 acres) in acreage due to the conversion of raster data to vector data.

Big Sagebrush Steppe occurs throughout the project area. Common grass and grass-like species in these communities include western (*Pascopyrum smithii*) and thickspike wheatgrass (*Elymus lanceolatus*), needleandthread (*Hesperostipa comata*), green needlegrass (*Nassella viridula*), prairie reedgrass (*Calamagrostis montanensis*), prairie junegrass (*Koeleria macrantha*), Sandberg bluegrass (*Poa secunda*), blue grama (*Bouteloua gracilis*), needleleaf sedge (*Carex duriuscula*), and threadleaf sedge (*Carex filifolia*). Bluebunch wheatgrass (*Pseudoroegneria spicata*) is also common throughout the project area where there are soils with adequate drainage. Wyoming big sagebrush (*Artemisia tridentata ssp. Wyomingensis*) is typically the dominant shrub, but silver sagebrush (*Artemisia cana*), rubber rabbitbrush (*Ericameria nauseosa*), winterfat (*Krascheninnikovia lanata*), broom snakeweed (*Gutierrezia sarothrae*), and the half-shrub, fringed sagewort (*Artemisia frigida*) are also common. Forbs include a wide variety of native flowering plants such as milkvetches (*Astragalus ssp.*), scarlet globemallow (*Sphaeralcea coccinea*), spiny phlox (*Phlox hoodii*), flax (*Linum ssp.*), and prairie sunflower (*Helianthus pauciflorus*). Forbs vary greatly with aspect, precipitation, and soil texture. This ecological system accounts for most of the forage that wildlife and livestock consume.

The Great Plains Mixed Grasses vegetation is a mixture of mid and short grasses that dominate the canopy cover with a minor forb component. Rhizomatous western wheatgrass is usually dominant, especially on finer-textured soils. Grasses were typically used by large herbivores such as bison, but since European settlement, herbivores such as cattle and sheep have been the primary users of the vegetation. Other plant species found include thickspike wheatgrass, green needlegrass, blue grama and needleandthread. Forb diversity is typically high. In the project area the sagebrush steppe lands border the mixed grass prairie. In these border regions, shrub-loving wildlife such as antelope, mule deer, and sage grouse are common. Common plant associations include Wyoming big sagebrush-western wheatgrass. Fire and grazing are the primary drivers of this system. Drought can also affect the vegetation, generally favoring the shortgrass component at the expense of the mid-height grasses. With intensive grazing, cool season exotics such Japanese brome (*Bromus japonicus*) increases. Sites with a strong component of green needlegrass indicate a more favorable moisture balance, although this is one of the most palatable of the mid-grasses. Needleandthread is also an important component; it increases

with coarser soil textures, or under heavy grazing at the expense of western wheatgrass. Extreme overgrazing can result in the loss of western wheatgrass from the system, followed by drastic reductions in needleandthread and ultimately, the dominance of blue grama, Sandberg bluegrass, and prairie junegrass. Common forbs within this system include yarrow (*Achillea millefolium*), scarlet globemallow, western sagewort (*Artemisia ludoviciana*), including dotted gayfeather (*Liatris punctata*), purple coneflower (*Echinacea angustifolia*), purple and white prairieclover (*Dalea purpurea*), and winterfat. Shrub species may include western snowberry (*Symphoricarpos occidentalis*), common chokecherry (*Prunus virginiana*), silver buffaloberry (*Shepherdia argentea*), creeping juniper (*Juniperus horizontalis*), silver sagebrush, and Wyoming big sagebrush.

Forestlands are dominated by ponderosa pine (*Pinus ponderosa*). Another vegetation type that makes up very small percentage of the project area but are an important ecological component is broadleaf and mesic shrubs, consisting of cottonwoods (*Populus* ssp.), willows (*Salix* ssp.), green ash (*Fraxinus pennsylvanica*), snowberry (*Symphoricarpos* ssp.), chokecherry (*Prunus virginiana*), and buffaloberry (*Shepherdia*). They are extremely diverse and thrive in areas receiving abundant moisture from runoff to subsurface springs or in drainage bottoms. There are also shrubs that occur where salt and alkali accumulate. Greasewood (*Sarcobatus vermiculatus*) and saltbush (*Atriplex* ssp.) are common shrubs in these areas; common grasses include inland saltgrass (*Disticlis spicata*) and alkali sacaton (*Sporobolus airoides*).

Ecological Site Classification System. Secondly, the Ecological Site (ES) Classification System is a finer scale ecological classification system and is used for land health assessment. An ecological site is defined as a distinctive kind of land with specific soil and physical characteristics that differ from other kinds of land in its ability to produce a distinctive kind and amount of vegetation and its ability to respond similarly to management actions and natural disturbances.

To provide further site-specific data based on the larger MLRAs, the NRCS has developed Ecological Site Descriptions (ESDs). The ESDs area based on site specific soil types, precipitation zones, and location. They describe the various characteristics and attributes including what vegetative species, and relative percentage of each, are expected to be present on the site.

The ecological site is the most basic unit on which land health is assessed. The ESD and ESD Reference sheet was used to evaluate the plot data and compare current conditions to the ESD standard. The ES information will be discussed in the Affected Environment section.

2.2.4 Analysis and Findings

This project was an effort to address the rangeland health determinations for groups of 1,372 allotments spread throughout the Miles City Field Office area. To do this, the IDT used a multiple scale approach to assess the attributes of vegetation cover, bare ground, and litter cover for these allotments by integrating the geospatial data of the RAP, the plot level, field data collected using the standardized AIM and LMF protocols, and professional knowledge.

The IDT initiated the evaluation by reviewing the cover estimates generated by the RAP for 2 time periods (1984-2009 and 2010-2019) and between BLM managed land only and all land (BLM, State and Private). Additionally, the IDT compared vegetation cover, litter cover, bare ground, and gap data from 289 AIM and LMF plots to the plot's respective ESD and Rangeland Health Reference Worksheet for each

attribute. Conditions on plots not within reference condition were further explored using plot photos, historical air photos, and professional interpretation to determine the cause of out-of-reference conditions. Most plots in this situation were on the fringe of reference values and influenced by small climactic or marginal soils property differences, indicating they are healthy and within the overall range of variation for these sites.

Rangeland Analysis Platform

The RAP is a tool land managers can use to track vegetation dynamics over time. The RAP combines over 30,000 field plots from the U.S. Department of Agriculture's NRCS National Resources Inventory (NRI) and the Bureau of Land Management's Assessment, Inventory, and Monitoring (AIM) and Landscape Monitoring Framework datasets (LMF) with the historical Landsat satellite record, gridded meteorology, and abiotic land surface data (e.g., elevation, soils). Utilizing the computation power of Google Earth Engine, the RAP produces charts and maps across the western half of the U.S. at 30x30 meter resolution, therefore, each pixel is slightly larger than a baseball diamond.

The RAP provides estimates of annual, historical (1984 to present) vegetation cover data for western U.S. rangelands. Percent cover estimates are generated for annual forbs and grasses, perennial forbs and grasses, shrubs, trees, and bare ground at the 30x30 meter resolution. These datasets allow for examination of vegetation dynamics that are particularly important for the long-term monitoring, conservation, and management of U.S. rangelands.

The RAP shows vegetation response to human – or natural-caused changes through time, such as drought, irrigation, grazing, or wildfire. The data available through RAP are estimates of percent vegetation cover and biomass production from 1984 to present. This information is used to evaluate the vegetation response to livestock grazing management strategies. RAP provides historical records of vegetation cover across large swaths of grazing lands. The indicators are used by the IDT to determine if uplands are meeting standards were annual forb and grass cover, perennial forb and grass cover, bare ground, and biomass production. Averages do not display model errors. The RAP vegetation cover estimates are modeled and have associated error metrics. The modeled vegetation cover, has model error specific to each vegetation cover class, as shown in Table 5.

Appendix C shows total precipitation and average annual temperature alongside each management zone. This information is used to help consider how site-level conditions relate to overall conditions in the surrounding area, assess whether changes in functional groups are within the normal range of variability, or evaluate potential response to management, weather, climate, or other factors. The RAP data coupled with the knowledge of the specific allotment management history, grazing strategies, and climate or weather patterns were used to decide if the management zones meet the upland standard.

Vegetation Cover Class	Annual Forbs and Grasses	Perennial Forbs and Grasses	Shrubs	Bare Ground
Mean Absolute Error (%)	7.8%	11.2%	6.9%	7.3%
Root Mean Square Error (%)	11.8%	14.9%	9.9%	10.6%

Table 5.	Mean Abso	lute Error	and Root N	Aean Souare	Frror per v	vegetation	cover class
Table J.	IVICALL ADSC		απα πουτ π	nean Square	LITUI DEL V	vegetation	

These errors provide an accuracy assessment. In basic terms, the vegetation cover value of a given pixel (e.g., 35% Annual Forb and Grass cover) should be thought of as 35% +/-7.8%. Hence, the confidence that the Annual Forb and Grass cover of that pixel is between 27.2% and 42.8% (if using mean absolute error). RAP provides aerial (top-down) vegetation cover estimates. Conditions are likely modeled responses due to temperature and precipitation fluctuations. The model uses seasonal summaries (e.g., spring maximums, summer means, fall minimums, etc.) of Landsat satellite date in vegetation predictions. In some years, limited satellite date is available over regions due to reduced satellite coverage, clouds, missing data, etc. This is particularly true for years 1984-1998 when only Landsat 5 was in orbit but can occur in other years as well. These limited retrievals result in visual artifacts within the vegetation cover data. In the cases of limited data, summary statistics used in the model are derived from minimal samples and may not be representative of the actual land surface conditions (Jones et al., 2018).

Management zones	Years	Average Annual Forb/Grass Cover (BLM)	Average Annual Forb/Grass Cover (All Lands)	Average Perennial Forb/Grass Cover Percent (BLM)	Average Perennial Forb/Grass Cover Percent (All Lands)	Averag e Shrub Cover Percent (BLM)	Average Shrub Cover Percent (All Lands)	Average Bare Soil Percent (BLM)	Average Bare Soil Percent (All Lands)
Belle Creek	1984- 2009	10.2%	12.2%	53.7%	54.8%	8.0%	7.3%	13.3%	11.8%
	2010- 2019	13.1%	14.6%	56.1%	57.9%	8.6%	7.7%	8.0%	7.1%
Bracket Creek	1984- 2009	6.4%	6.4%	57.5%	54.9%	7.0%	7.1%	15.7%	18.8%
	2010- 2019	6.6%	6.7%	64.4%	62.8%	7.4%	7.3%	9.0%	10.9%
Bickerdyke	1984- 2009	7.8%	9.1%	51.2%	57.2%	6.8%	6.3%	22.0%	16.6%
	2010- 2019	12.6%	12.3%	55.5%	62.0%	6.8%	5.9%	13.6%	10.0%
Cache Creek	1984- 2009	8.5%	11.0%	42.7%	47.7%	9.1%	8.4%	18.6%	14.3%
	2010- 2019	10.1%	11.3%	43.9%	49.9%	9.9%	9.0%	13.1%	9.9%
CB Grazing District	1984- 2009	7.7%	9.8%	47.0%	51.6%	8.1%	7.5%	26.2%	20.9%
	2010- 2019	12.3%	11.8%	52.7%	57.9%	7.5%	6.9%	16.2%	13.0%
Cedar Creek	1984- 2009	7.2%	8.5%	51.4%	55.2%	7.3%	7.1%	23.2%	18.9%
	2010- 2019	12.1%	12.0%	56.4%	60.4%	7.3%	7.0%	14.9%	11.6%
Cherry Creek	1984- 2009	6.7%	6.3%	56.6%	52.0%	7.0%	7.7%	16.2%	21.1%
	2010- 2019	8.7%	8.2%	63.3%	58.2%	7.1%	8.0%	8.5%	12.9%
Cottonwood	108/1-	7 5%	10.2%	17.6%	52.8%	8 1%	7.0%	25 /1%	17.8%

Table 6: RAP summarization by Management Zones

Create Dat	2000								
Сгеек ка	2009								
	2010-	11.1%	13.6%	53.2%	58.6%	8.1%	6.9%	17.0%	11.4%
	2019								
Crow Creek	1984-	10.1%	11.9%	55.6%	56.1%	7.1%	7.0%	13.6%	12.9%
	2009								
	2010-	14 1%	15 7%	58.8%	59.1%	7 9%	7 5%	8.1%	7.8%
	2010	1.1.70	10.770	30.070	55.170	7.370	7.370	0.1/0	7.070
Dealers	2019	11.00/	42.40/	12 70/	46.20/	10.20/	0.49/	42.00/	12.20/
Decker	1984-	11.8%	13.4%	43.7%	46.3%	10.2%	9.4%	13.9%	13.2%
	2009								
	2010-	13.3%	15.4%	42.2%	46.7%	12.6%	11.2%	10.1%	9.5%
	2019								
Dry Arm	1984-	4.2%	5.0%	51.1%	55.6%	8.1%	7.8%	22.5%	18.3%
•	2009								
	2010-	6.4%	7.4%	52.8%	57.2%	9.8%	9.4%	16.8%	12 7%
	2010-	0.470	7.470	52.070	57.270	5.870	5.470	10.870	12.770
	2019	= ===(= ===(17.00/	17.00/	0 70/	0.494		10.000
East	1984-	5.7%	5.7%	47.2%	47.9%	8.7%	9.4%	14.1%	16.8%
Musselshell	2009								
	2010-	8.7%	8.5%	53.8%	51.2%	9.4%	9.8%	8.1%	11.5%
	2019								
Finger Buttes	1984-	8.2%	9.2%	55.4%	56.2%	6.2%	6.2%	17.4%	17.0%
0	2009								
	2005	11 7%	12.0%	60.2%	60.7%	5.0%	5.0%	11 10/	10.7%
	2010-	11.770	13.070	00.576	00.776	3.5%	3.5%	11.170	10.776
	2019	0.00/	5 00(== 404	70.00/	0.00(6.00/	10.00/	0.00/
Glaciated	1984-	3.8%	5.2%	55.1%	70.0%	8.3%	6.0%	19.8%	9.8%
	2009								
	2010-	5.4%	5.4%	58.4%	75.8%	8.7%	6.1%	14.5%	4.8%
	2019								
Glendive	1984-	6.5%	6.6%	50.3%	50.9%	8.2%	8.6%	20.3%	20.8%
	2009								
	2005	8.6%	8.0%	EQ E0/	57.6%	Q 7%	<u> 9 0%</u>	10.5%	12.6%
	2010-	0.070	0.070	50.570	57.0%	0.270	0.970	10.576	12.070
	2019		= + + + +	17.00/	=0.00/	0.00(= 00/	0.4 70/	
Haxby	1984-	4.7%	5.1%	47.6%	50.2%	8.2%	7.9%	24.7%	22.2%
	2009								
	2010-	7.1%	7.8%	50.4%	52.6%	9.6%	9.3%	17.6%	15.4%
	2019								
Indian Creek	1984-	7.8%	9.7%	53.7%	57.7%	5.9%	5.5%	20.5%	16.2%
	2009								
	2010-	10.5%	11.6%	58.3%	62.1%	6.4%	5.8%	14.0%	10.8%
	2010-	10.570	11.070	50.570	02.170	0.470	5.670	14.070	10.870
14 1.	2019	0.50/	10.10/	54.00/	52.40/	7.60/	7.00/	44.20/	45.00/
Knowiton	1984-	9.5%	10.1%	54.8%	53.1%	7.6%	7.9%	14.2%	15.0%
	2009								
	2010-	11.7%	12.5%	59.1%	57.3%	8.1%	8.5%	8.9%	9.5%
	2019								
Little Powder	1984-	10.4%	12.1%	47.1%	49.1%	8.3%	8.0%	13.6%	12.6%
River	2009								
	2010-	10.9%	12.3%	48 5%	51.5%	9.2%	8.9%	9.1%	8.5%
	2010	10.570	12.570	10.570	51.570	5.270	0.570	5.170	0.070
N Atlahua al	1004	7 70/	7.00/		F2 40/	C 00/	7 50/	14.00/	17.00/
willarea	1984-	1.1%	7.9%	55.8%	53.4%	0.8%	7.5%	14.9%	17.8%
	2009								
	2010-	9.3%	9.6%	62.4%	62.1%	7.3%	7.6%	7.5%	8.8%
	2019								
Missouri	1984-	4.1%	5.6%	43.2%	49.8%	9.6%	8.6%	24.5%	18.5%
Breaks	2009								
	2010-	6.5%	8.4%	44 9%	51.4%	10.8%	9.8%	18.2%	13 1%
	2010	0.070	0.470		51.7/0	10.070	2.070	10.270	13.1/0
D4:	1004	0.00/	11 70/	40 40/	40 70/	0.50/	7.00/	10.00/	17.00/
iviizpan	1984-	9.8%	11.7%	46.1%	48.7%	8.5%	7.9%	19.6%	17.0%
	2009								
	2010-	12.3%	14.1%	49.3%	53.0%	9.7%	8.6%	13.1%	10.7%
	2019								
-------------	-------	--------	--------	---------------	--------	-------------	-------	--------	--------
Plains	1984-	6.9%	11.7%	48.0%	47.5%	8.8%	9.1%	18.8%	12.0%
	2009								
	2010-	10.2%	12.8%	48.9%	47.6%	9.7%	10.1%	13.2%	9.2%
	2019								
Plevna	1984-	9.3%	10.0%	59.4%	58.7%	7.0%	6.9%	12.1%	12.5%
	2009					/			
	2010-	10.6%	12.2%	65.6%	63.8%	6.9%	6.9%	6.3%	7.0%
	2019	0.40/	0.001	E4 00/	50.40/	0.00(7.00/	45.20/	42.624
Powderville	1984-	8.4%	9.9%	54.8%	56.1%	8.0%	7.8%	15.2%	13.6%
Ка	2009	10.6%	12.20/	F7.60/	EQ 49/	0.20/	7.00/	10.20/	0.00/
	2010-	10.0%	12.5%	57.0%	59.4%	0.5%	7.070	10.2%	0.070
Ridge	198/-	8.3%	10.4%	17.9%	53.3%	8.5%	7.8%	21 5%	16.0%
Muge	2009	0.570	10.470	47.570	55.570	0.570	7.070	21.370	10.070
	2010-	10.6%	12.6%	52.6%	57.3%	8.5%	7.4%	15.2%	10.9%
	2019								
Ridgeway	1984-	9.8%	11.0%	50.8%	54.3%	7.3%	7.1%	20.9%	16.7%
Ridge Rd	2009								
	2010-	15.5%	15.4%	54.1%	57.7%	6.8%	6.6%	12.7%	9.9%
	2019								
Rosebud	1984-	5.7%	7.6%	37.3%	40.8%	9.5%	9.6%	31.3%	26.8%
	2009								
	2010-	11.5%	14.4%	37.3%	40.9%	11.0%	10.6%	23.4%	18.5%
	2019					/			
Unglaciated	1984-	6.2%	8.8%	57.8%	62.1%	7.7%	6.9%	16.7%	12.0%
	2009	7 70/	0.2%	62.6%	60.00/	7.00/	C C0/	10.4%	6.0%
	2010-	1.1%	9.3%	62.6%	68.0%	7.8%	6.6%	10.4%	6.8%
Wildhorso	1094	0.9%	12.0%	12 1%	16.9%	8 0%	Q E0/	20.1%	15 0%
wiidhorse	2000	9.8%	12.0%	43.1%	40.8%	8.9%	8.5%	20.1%	15.9%
	2005	13.0%	1/1 5%	45.0%	/9.5%	9.8%	9.2%	14.0%	10.7%
	2010-	13.070	14.570	45.070	49.570	5.070	3.270	14.070	10.770
	2013	1		1	1	1	1	1	1

Table 7: RAP Summarization of All Management zones and All Lands (private, state, andBLM lands) within the grazing allotments.

All Management zones	Years	BLM Average	BLM Difference	All Lands Average	All Lands Difference
Annual Forb/Grass cover	1984-2009	7.7%	2.7%	9.1%	2.3%
	2010-2019	10.4%		11.4%	
Perennial Forb/Grass Cover	1984-2009	50.4%	3.8%	53.1%	4.0%
	2010-2019	54.2%		57.0%	
Shrub Cover	1984-2009	8.0%	0.5%	7.7%	0.4%
	2010-2019	8.5%		8.0%	
Bare Soil	1984-2009	19.0%	-6.6%	16.5%	-6.0%

	2010-2019	12.4%		10.5%	
Tree Cover	1984-2009	1.0%	0.7%	1.0%	0.7%
	2010-2019	1.7%		1.7%	
Annual Temp	1984-2009	45.2° F	-0.1 F	45.3° F	-0.1 F
	2010-2019	45.1° F		45.1° F	
Annual Precipitation	1984-2009	13.7"	3.8''	13.8"	3.9''
	2010-2019	17.6"		17.7"	
All Management zones	Vears	BIM Average	BIM %	abac L IIA	All Lands %
An Management 20nes	TCars	DLIVI AVEI age	DEIVI /0		All Lallus 70
An Management Zones	rears	DLINI AVEI age	Change	Average	Change
Annual Forb/Grass Biomass	1984-2009	79.2	Change 35%	Average 96.2	Change 40%
Annual Forb/Grass Biomass	1984-2009 2010-2019	79.2 121.0	Change 35%	Average 96.2 135.0	Change 40%
Annual Forb/Grass Biomass Perennial Forb/Grass Biomass	1984-2009 2010-2019 1984-2009	79.2 121.0 719.4	21%	Average 96.2 135.0 774.1	40%
Annual Forb/Grass Biomass Perennial Forb/Grass Biomass	1984-2009 2010-2019 1984-2009 2010-2019	79.2 121.0 719.4 905.1	Change 35% 21%	Average 96.2 135.0 774.1 975.4	Change 40% 26%
Annual Forb/Grass Biomass Perennial Forb/Grass Biomass Herbaceous Biomass	1984-2009 2010-2019 1984-2009 2010-2019 1984-2009	79.2 121.0 719.4 905.1 796.4	Change 35% 21% 22%	Average 96.2 135.0 774.1 975.4 849.0	Change 40% 26% 28%

The RAP model provides a remotely derived estimate of plant community attributes as a tool for monitoring rangelands. Table 9 summarizes the RAP data by management zone across the project area on BLM administered lands comparing them to all lands (private, state, & other federal lands) within the management zone for the timeframes 1984-2009, and 2010-2019. For the attributes listed, the model was not able to detect any differences between the BLM land and the All Lands for a given management zone. This would suggest the grazing management within a zone results in a similar plant community for BLM only and All lands.

In all management zones, on BLM administered lands in the last 10 years (2010-2019), average bare soil has decreased 6.6%, average annual forb/grass cover has increased by 2.7%, average perennial forb/grass cover has increased by 3.8%, average shrub and tree cover have remained relatively the same, and herbaceous biomass has increased by 22% (see table 7). However, all the change values fall within the calculated error values of; + or - 7.8% for annual forbs and grasses, + or - 11.2% for perennial forbs and grasses, + or - 6.9% for shrubs, and + or - 7.3% for bare ground. This means the data does not support BLM lands being measurably different from All Lands values or BLM values from 1984-2009 being measurably different from 2021-2019.

Table 7, suggests, when considered within the scope of the model error, the RAP was unable to detect any differences for the listed attributes between periods 1 and 2, 1984-2009 and 2010-2019, respectively. The largest mathematical difference between periods is noted for bare ground as the RAP estimate between periods 1 and 2 returns an estimate of 6.6% for BLM lands only and 6% for All Lands. The model error for this is attribute is +/- 7.3%, meaning the stated difference is not actually a detected difference.

Temperature and precipitation estimates are generated within the RAP using gridMET (Abatzoglou 2013). The RAP estimates indicate an increase in precipitation for the past 10 years when compared to output from 1984 to 2009. Local RAWs stations within the MCFO, for the most part, also captured an increase in precipitation for the period with stations showing high variability with increase between periods, one station reporting less than an inch of increase. It is interesting to note in the article

"Historical Character of U.S. Northern Great Plains Droughts" (drought.gov) 2006 – 2015 was the wettest 10-year period since 1916 in the NGP. Abatzoglou (2013) cautions high-resolution datasets are not equated to realism or have direct application to point-scale observation. Additionally, he notes small scale convection type precipitation is not well captured by weather station networks or atmospheric models and may be subject to error.

The RAP output shows grazing management practices are maintaining adequate amounts of ground cover (determined on an ecological site basis) to support infiltration, maintain soil moisture storage, and stabilize soils. The available data demonstrates that the integrity of the soil and ecological processes of rangeland ecosystems are being sustained. The ecological processes are functioning properly to maintain the structure, organization, and activity of the system over time. Also, the production of each assessment area is comparable to the production observed in a representative Historical Climax Plant Community (HCPC).

Foliar cover is present in sufficient amount on all assessment areas to dissipate energy of raindrop impact on the soil. Plant species abundance can be measured in numerous ways, but the standard measure for potential natural vegetation classification purposes is percent cover. Cover is a meaningful attribute for nearly all plant lifeforms, which allows their abundances to be evaluated in comparable terms (Daubenmire 1968, Mueller-Dombois and Ellenberg 1974).

Figure 5: Map of AIM and LMF points analyzed in this project. AIM plots not within project allotments are purple triangles, AIM plots within project allotments are green triangles, LMF plots not within project allotments are purple diamonds, and LMF plots within project allotments are green diamonds. Many plots are close to each other, therefore individual plots are difficult to see on the map at this scale.



Plot Level Data

To further assess key plant community attributes by Management Zone, 289 AIM and LMF plots across MCFO (Figure 5) were evaluated against the ESD conditions and the ESD Reference Sheet for the keyed ecological at the plot location. Plots located within project allotments were specifically focused on, which included 127 plots. Attributes considered were average foliar cover for grass/ sedge, forbs, shrub, and litter (see Table 9). Bare ground was also evaluated against the ESD reference. Reference values used for grass/sedge, forbs, and shrubs were from the ESD Cover and Structure table that describes HCPC conditions, while litter and bare ground were used from the Ecological Site Description–Rangeland Health Reference Worksheet.

HCPC represents optimal conditions prior to the arrival of homesteaders and livestock grazing. Because of this, each ESD has a range of conditions and variability; using data together with professional evaluation were used to determine if a plot was genuinely not within the range of variability. Additional lines of evidence including transect photos (landscape – AIM and LMF, and vertical plot photos – AIM only) and professional judgement were used to interpret the data. Plots that fell significantly outside the range of variability of reference conditions or were not within reference conditions for more than one attribute were scrutinized more closely.

The AIM/LMF data differ from the RAP output in that the RAP is a "bird's eye" and relates to the first hit in the canopy while the AIM/LMF data consider all hits within the canopy.

Silty/Loamy Grouped Ecological Sites

Ecological sites in the Silty/Loamy Grouped are the most common ecological site covering about 35% of the project area and were present in 27 of the 30-management zones. Between 2017 and 2020, 119 Silty/Loamy Grouped plots were evaluated across the project area, with 59 of these plots within project allotments.

The soil surface across all management zones was mostly well protected as the average percent foliar cover for grass/sedge, forbs, shrubs, and litter was within reference conditions for the respective ESD reference attribute (Appendix D). Good ground protection was also reflected in the bare ground attribute, as bare ground was typically less than the ESD references of 20% and 25% for Silty and Silty Steep, respectively. Plots that with attributes that fell marginally outside of reference conditions (<5%) were determined not to be out of reference for the respective ecological site. Within project allotments some Silty/Loamy plots fell outside reference conditions. One Silty Steep plot in the Belle Creek management zone was out of reference conditions for three attributes: grass/sedge, litter, and bare ground. On further inspection of the plot, it was located on a hillslope next to a drop off. The physical location influenced the vegetation at this site and was out of HCPC reference conditions but considered within the range of variability for the ES. Another Silty plot in the Cherry Creek management zone had low grass/sedge cover and high bare ground; on further inspection this plot was located near an eroding draw, and one transect crossed a cattle trail. Considering these factors, the site was still determined to be within the range of variability for a Silty ES. Additional plots that had slightly more bare ground and less litter than reference conditions were located near or on transition areas to badlands, draws, or other landscape features.

Across all Silty/Loamy plots the predominant overstory of native grasses (percent foliar cover) were cool season rhizomatous and bunchgrasses with an understory of upland sedges and warm season short stature grasses. Western wheatgrass/Montana wheatgrass was the most common mid-stature grass with an average foliar cover of 21%, and the short stature grasses were blue grama and buffalograss. Bluebunch wheatgrass and needleandthread followed with cover estimates of 8% each. Little bluestem (10%) was the most common warm season grass. Plots within the project area were somewhat similar in composition, but the dominant grasses were smooth brome (28%), followed by western wheatgrass (17%), and crested wheatgrass (17%).

In addition to shorter stature grasses and sedges, forbs were also a common part of the understory. Across all plots, 194 forb species were identified and among the most common were dense clubmoss (11%), prostrate pigweed (7%), and pale madwort (6%). Prevailing shrubs for the group included Wyoming big sagebrush (10%), snowberry (7%), and creeping juniper (5%). Twenty-three additional woody species were identified. The forb composition was very similar to plots within project allotments.

Non-native species were also present, including the perennial grasses crested wheatgrass (17%), smooth bromegrass (28%), and Kentucky bluegrass (9%). Japanese brome (22%) and cheatgrass (12%) were the most common non-native annual grasses. Crested wheatgrass was second only to western wheatgrass in foliar cover in plots within project allotments. However, cheatgrass and Japanese brome comprise part of the understory and do not appear to be crowding out native plants. Many BLM managed surface acres where the Silty/Loamy ecological sites occur are Land Use (LU) lands. LU lands were formerly homesteads where they were unsuccessful or abandoned, and in poor condition. In 1937, the Bankhead-Jones act was passed, and these lands were acquired by the federal government to rehabilitate. Many of these lands were previously seeded with crested wheatgrass and are still present today. Specifically, in

the Plevna and Ridge management zone, plots within project allotments had large amounts of crested wheatgrass and one plot was dominated (74% foliar cover) by smooth brome (*Bromus inermis*). This plot was near a stream and riparian area, in addition to nearby farm fields. Traces of noxious weeds found on plots within project allotments including leafy spurge, Canada thistle, and field bindweed.

Clay Based Grouped Ecological Sites

Ecological sites in the Clay-based Grouped are the second most common within the project area, covering about 29% of the project area and were evaluated in 26 of the 30 management zones. Between 2017 and 2020, 98 Clay-based Grouped plots were evaluated across project area and 41 plots were within project allotments.

The soil surface across all Management Zones was well protected as most plots the had foliar cover for grass/sedge, forbs, shrubs, and litter within natural variation of the ESD estimates. Bare ground reference conditions range from less than 20% for most of the ecological sites in the group to 60% on Dense clay ES. All plots within project allotments were within in reference for attributes (Table 9), except three. A Dense Clay plot in the Cottonwood Creek management zone had low litter and shrub cover but was still considered within the range of variability for the ES. Photos of the plot show shrubs present in the area but do not occur on the transects. A Clayey plot in the Haxby management zone had low grass/ sedge cover (45%) and high bare ground cover (24%) compared to ESD reference conditions. Upon inspection of photos, a transect on this plot crosses a small stream and another transect portion ends on a badland outcrop. With those two landscape features considered within the range of variability for a Clayey ES. Another Clayey plot in the Plains management zone had marginally lower grass/sedge cover (47%) and low litter (13%) than reference conditions. Photos of this plot show a transect crossing a badland outcrop, which presumably contributed to plot estimates of these two attributes and this plot was considered within reference conditions.

For all plots in the project area 4 of the 5 ecological sites (Clayey, Claypan, Dense clay, Shallow clay) sampled in this Group, mid-stature, cool season rhizomatous wheatgrasses should be the predominant overstory grass species. On plots within project allotments, western wheatgrass (21%) and/or thickspike wheatgrass (16%) were the two codominant species. Blue grama (10%) was the most common understory native grass species and the second most common, the nonnative Kentucky bluegrass (10%). Salt tolerant grass species were common on Claypan sites compared to the other sites, which is typical for a Claypan. Coarse clay ecological sites have a warm season dominated plant community and the only Coarse Clay plot within a project allotment had an altered plant community, due to previous land use. The plot was dominated by an overstory of crested wheatgrass and western wheatgrass also with an understory of blue grama. Upland sedges were common on all sites except Dense Clay. No zones were distinct from one another in terms of plant community. Many plots had some Japanese brome present as an understory. A few plots however, had abundant clubmoss present. One Claypan site within a project allotment zone had 75% cheatgrass cover and another Clayey site in the Ridge management zone had almost 70% sweet clover cover.

Sand/Gravel Grouped Ecological Sites

The Sand/Gravel grouped ecological sites cover 8% of the project area and sites were present in 16 of 30 management zones. Between 2017 and 2020, 41 Sand/Gravel grouped plots were evaluated across all

zones and 16 plots occurred within project allotments that were in 12 management zones.

Across all plots in the Sand/Gravel group, the soil surface was mostly well protected by an adequate amount of grass/sedge, forb, and shrub cover. Litter cover on some plots were lower than expected for their respective ESD but with adequate cover for the other attributes and low bare ground; these plots are still within the reference conditions. One plot was out of reference conditions for all attributes except one. This was a Sands plot in the Cherry Creek management zone and inspection of the plot phots showed it was in the middle of a prairie dog town. Because of the prairie dog town, the plot is considered an altered site, and therefore would not be expected to be within reference conditions of the ESD. This plot was not located within a project allotment. Sand/Gravel plots within project allotments were within reference conditions or within the range of variability for their respective ESDs.

Plant community composition for Gravel, Sandy, and Sands ecological sites are similar and should be composed of a mix of mid-stature cool and warm season bunchgrasses; but Sandy, Sandy-Steep, and Sands ES should have a more dominant grass component of warm season grasses and sedges than the Gravel ES. Across all sites, the most common grasses in the Sand/Gravel grouped ES was crested wheatgrass (18%), Kentucky bluegrass (13%), needleandthread (12%), western wheatgrass (11%), and prairie sandreed (11%). These grasses are also dominant in the Sandy and Sands plots, while crested wheatgrass was not found in the Gravel or Sandy Steep plots. The dominant rhizomatous grasses in Sandy and Sands ES are a minor deviation of what should be expected for the site, where bunchgrasses should be dominant. The prevailing forbs across the group are dense clubmoss, European stickseed, and crocus. A wide variety of native forbs are expected across the Grouped sites. The most common shrubs across the group were creeping juniper (19%), Wyoming big sagebrush (10%) and common snowberry (4%). Common shrubs expected for this group are silver sagebrush, fringed sagebrush, and winterfat. Plots within project allotments reflected the overall species composition across all plots and no plots deviated far from the expected plant community aside from plots with Japanese brome or cheatgrass present as minor components of the understory.

Saline Grouped Ecological Sites

Ecological sites in the Saline Group are not as common, covering 3% of the project area and were present in the 5 of 30 management zones. Between 2017 and 2020, 13 Saline Grouped plots were evaluated across all zones and eight plots were within project allotments in three management zones.

The soil surface across all plots was well protected as the average for foliar cover for grass/sedge, forbs, and litter were within reference conditions for the ESD. Bare ground was also within reference conditions for the ESD, less than 60%. However, five plots within project allotments had low shrub cover reference conditions for a Saline Upland Site. Shrub cover reference conditions for Saline Uplands is 20-25% and the average was 10% across all plots. The Cottonwood Creek management zone had four Saline Upland plots within project allotments, and three had low shrub cover. In two of those plots, photos showed shrubs in the plot area but did not fall on the transects, thus lowering the shrub cover estimate. The third plot showed historical signs of disturbance, likely chiseled or some sort of shrub removal. Because only the Saline Lowland plot within a project allotment was within reference conditions, the following discussion will focus on Saline Uplands.

Plant community composition for Saline Uplands should be primarily composed of salt tolerant species with a dominance of mid-stature warm season bunchgrasses, cool season rhizomatous wheatgrasses,

and some forbs. Shrubs and half shrubs may comprise nearly half of the plant community. Across all plots, dominant grasses were a warm season bunchgrass alkali sacaton (20%), western wheatgrass (18%) a cool season rhizomatous grass, slender wheatgrass (13%) a cool season rhizomatous grass, and prairie junegrass (11%) a warm season bunchgrass. Plots in within project allotments also had similar communities except one plot. A Saline Upland plot in the Rosebud management zone had 48% sweet clover and this plot was sampled in 2019. It appears that conditions in 2019 were prime for sweet clover, as sweet clover cover was the highest 2019 in many plots of various ESs. Overall, the grass/sedge component was largely within reference conditions, with a mixture of warm and cool season grasses.

Common forbs across all Saline Upland plots include rose pussytoes (17%), dense clubmoss (10%), sweet clover (10%), prairie thermopsis (9%), and woolly plantain (5%). According to the ESD, forbs common to Saline Uplands include poverty sumpweed, American vetch, buckwheat spp., bicuitroot spp., and other native forbs. Forb composition is variable across plots within and not within project allotments, and across all management zones. Common shrubs for all Saline Upland plots consist of Wyoming big sagebrush (8%), Gardner's saltbush (3%), and broom snakeweed (3%). Shrub composition and percent cover within project allotments are nearly identical to Saline Upland plots outside of project allotments.

Shallow Grouped

Shallow grouped ESs are more common than Sand/Gravel and Saline groups covering 13% of the project area, but only 11 plots of 289 were in the Shallow group. Of the 11 plots, two were within project allotments, one Shallow and one Very Shallow plot.

Shallow grouped plots had good soil protection as the cover for grass/sedge, forb, shrub, and litter attributes were within reference conditions. Bare ground was also well below the refence conditions.

All Shallow grouped plots were composed of dominant grasses western wheatgrass (15%), buffalograss (8%), and little bluestem (8%). The understory for the plots consisted of prairie junegrass (6%), threadleaf sedge (13%), and blue grama (5%). This grass component reflects what is expected for a Shallow ES, a mixture of dominant cool and warm season bunchgrasses. However, the Shallow plot within a project allotment in Cottonwood Creek management zone had a considerable understory of Japanese brome (55%). The Very Shallow ES has a similar grass component to Shallow but is expected to have less forb cover than a Shallow site. The Very Shallow plot within a project allotment in the Mizpah management zone had a similar plant community to the Shallow plot but had an even greater Japanese brome cover (60%).

Other Grouped

Other grouped ecological sites are primarily Overflow sites. Other grouped sites cover 3% of the project area and seven Overflow plots were assessed in the project area between 2017-2020. Only one Overflow plot was within a project allotment in the Rosebud management zone.

Attributes across all Overflow plots were within reference conditions. Plant species composition across all Overflow plots were a mixture of cool and warm season grasses; western wheatgrass was most common (28%) followed by Sandberg's bluegrass (21%), prairie sandreed (14%), and little bluestem (13%). Short stature grasses in the understory consisted of Kentucky bluegrass (5%), prairie junegrass (4%), blue grama (5%), and sedge (5%). Expected composition is a mixture of cool and warm season

grasses but would expect to have big bluestem and green needlegrass as dominant species followed by needleandthread, western wheatgrass, and switchgrass. Forbs and shrubs are a small component of an Overflow site and the most common shrubs found across all Overflow plots were creeping juniper (21%), Wyoming big sagebrush (14%), and snowberry (11%). The Overflow plot within a project allotment has a similar grass composition but differed on shrub composition with silver sagebrush as the dominant shrub (14%).

Plot level weed data

Non-native, weedy species were identified on 38% of AIM/LMF plots (48 of 127) evaluated in project allotments between 2017 and 2020. Plots with weed species were in 19 of 30 Management Zones where the plots had at least one weedy species present. Montana state noxious weeds found included leafy spurge (Euphorbia esula), Canada thistle (Cirsium arvense), field bindweed (Convolvulus arvensis), dalmation toadflax (Linaria dalmatica), and one non-noxious Montana regulated species, cheatgrass (Bromus tectorum). Cheatgrass was present in 38 plots, 14 of the plots recorded cheatgrass during the species richness survey, thus had no foliar cover estimates. Average foliar cover for cheatgrass was 11% across the 38 plots and the cover values ranged from 1-75% cover. Three plots had greater than 40% cover (54, 55, and 75%). Leafy spurge was found on two plots each with 1% cover and three more plots detected leafy spurge during the species richness inventory. Canada thistle was found during the species richness survey on five plots and none on transects, thus no cover estimates are available. Field bindweed was detected in species richness survey in four plots, and one plot had 1% cover. Dalmation toadflax was also found in one plot during species richness survey. Weedy species occurred mostly on Silty/Loamy sites, followed by Clayey, Sand/Gravel, and Shallow (Table 8). No noxious or regulated plant species were found on Saline or Overflow sites.

Grouped ESD	Cheatgrass	Leafy Spurge	Canada Thistle	Field Bindweed	Dalmation Toadlfax
Silty/Loamy	23	1	3	2	-
Clayey	11	3	2	-	1
Sand/Gravel	2	1	-	1	-
Saline	-	-	-	-	-
Shallow	2	-	-	-	-
Other	-	-	-	-	-
Total	38	5	5	3	1

Table 8: Montana state regulated/noxious weed species found on plots within projectallotments between 2017-2020

Table 9: Indicator values for the plots within project area allotments. Three columns are present for each indicator; the first is value for the plot, the second is the average for the ecological site in that zone (average includes plots not within project area allotments), and the third column is the reference conditions for the ecological site.

Zone ESD (Year)	Grass/Sedge Foliar Cover (%)	Ave Grass/Sedge Foliar Cover for Zone (%)	Grass/Sedge ESD reference (%)	Forb Foliar Cover (%)	Ave Forb Foliar Cover for Zone (%)	Forb Cover ESD reference (%)	Shrub Foliar Cover (%)	Ave. Shrub Foliar Cover for Zone (%)	Shrub Cover ESD reference (%)	Litter Cover (%)	Ave Litter Cover for Zone (%)	Litter Cover ESD reference (%)	Bare Soil (%)	Ave. Bare Soil for Zone (%)	Bare Soil ESD reference (%)
Belle Creek															
Clayey (2019)	69	79	55-85	13	16	5-10	11	15	1-5	33	68	35-60	9	3	< 20
Silty (2019)	62	62	60-85	13	13	1-5	7	7	T-1	58	58	50-60	13	13	< 20
Silty-Steep (2019)	34	56	60-70	9	17	1-5	18	13	5-10	25	53	40-48	35	23	< 25
Bickerdyke															
Clayey (2017)	83	76	55-85	23	25	5-10	12	10	1-5	76	73	35-60	1	5	< 20
Clayey (2018)	85	76	55-85	70	25	5-10	16	10	1-5	69	73	35-60	0	5	< 20
Clayey (2020)	62	76	55-85	40	25	5-10	11	10	1-5	81	73	35-60	6	5	< 20
Claypan (2017)	58	58	30-50	67	67	5-10	12	12	2-10	40	40	5-10	3	3	< 40
Dense Clay (2017)	72	72	20-30	6	6	T-1	5	5	20- 25	59	59	15-20	20	20	< 60
Silty (2018)	86	86	60-85	43	43	1-5	0	0	T-1	76	76	50-60	1	1	< 20
Brackett Creek															
Clayey (2020)	77	77	55-85	9	9	5-10	26	26	1-5	67	67	35-60	12	12	< 20
Cache Creek															
Sands (2020)	84	84	50-60	18	18	5-10	14	14	1-3	93	93	40-49	0	0	< 20
CB Grazing															

Zone ESD (Year)	Grass/Sedge Foliar Cover (%)	Ave Grass/Sedge Foliar Cover for Zone (%)	Grass/Sedge ESD reference (%)	Forb Foliar Cover (%)	Ave Forb Foliar Cover for Zone (%)	Forb Cover ESD reference (%)	Shrub Foliar Cover (%)	Ave. Shrub Foliar Cover for Zone (%)	Shrub Cover ESD reference (%)	Litter Cover (%)	Ave Litter Cover for Zone (%)	Litter Cover ESD reference (%)	Bare Soil (%)	Ave. Bare Soil for Zone (%)	Bare Soil ESD reference (%)
Saline Upland (2017)	69	49	10-25	4	7	1-5	10	10	20- 25	47	35	10-15	19	30	< 60
Claypan (2017)	68	52	30-50	13	21	5-10	17	12	2-10	74	45	5-10	5	18	<40
Cedar Creek															
Clayey (2019)	75	75	55-85	45	45	5-10	9	9	1-5	60	60	35-60	7	7	< 20
Silty (2019)	89	87	60-85	23	34	1-5	9	7	T-1	87	73	50-60	1	1	< 20
Silty (2020)	86	87	60-85	45	34	1-5	5	7	T-1	59	73	50-60	1	1	< 20
Cherry Creek															
Silty (2017)	79	85	60-85	1	14	1-5	0	7	T-1	80	62	50-60	2	4	< 20
Silty (2019)	45	85	60-85	7	14	1-5	4	7	T-1	3	62	50-60	43	4	< 20
Cottonwood Creek															
Clayey (2017)	96	70	55-85	15	12	5-10	9	9	1-5	93	60	35-60	0	13	< 20
Clayey (2017)	57	70	55-85	9	12	5-10	13	9	1-5	30	60	35-60	22	13	< 20
Dense Clay (2019)	30	30	20-30	11	11	T-1	5	5	20- 25	3	3	15-20	50	50	< 60
Shallow Clay (2018)	66	66	20-40	23	23	1-5	17	17	10- 15	66	66	20-30	10	10	< 40
Saline Upland (2017)	33	32	10-20	3	7	1-5	13	13	20- 25	28	21	10-15	23	33	< 60
Saline Upland (2018)	39	32	10-20	12	7	1-5	22	13	20- 25	33	21	10-15	15	33	< 60

Zone ESD (Year)	Grass/Sedge Foliar Cover (%)	Ave Grass/Sedge Foliar Cover for Zone (%)	Grass/Sedge ESD reference (%)	Forb Foliar Cover (%)	Ave Forb Foliar Cover for Zone (%)	Forb Cover ESD reference (%)	Shrub Foliar Cover (%)	Ave. Shrub Foliar Cover for Zone (%)	Shrub Cover ESD reference (%)	Litter Cover (%)	Ave Litter Cover for Zone (%)	Litter Cover ESD reference (%)	Bare Soil (%)	Ave. Bare Soil for Zone (%)	Bare Soil ESD reference (%)
Saline Upland (2018)	22	32	10-20	3	7	1-5	12	13	20- 25	7	21	10-15	53	33	< 60
Saline Upland (2018)	37	32	10-20	11	7	1-5	6	13	20- 25	17	21	10-15	43	33	< 60
Shallow (2017)	73	73	20-30	11	11	1-5	3	3	10- 15	49	49	15-25	7	7	< 30
Crow Creek															
Clayey (2019)	59	75	55-85	11	12	5-10	5	5	1-5	19	53	35-60	27	14	< 20
Clayey (2020)	91	75	55-85	12	12	5-10	5	5	1-5	87	53	35-60	1	14	< 20
Silty (2019)	91	91	60-85	6	6	1-5	14	14	T-1	31	31	50-60	6	6	< 20
Decker															
Clayey (2020)	48	48	55-85	3	3	5-10	11	11	1-5	95	95	35-60	1	1	< 20
Silty (2017)	80	82	60-85	18	17	1-5	26	26	T-1	88	86	50-60	4	4	< 20
Silty (2017)	84	82	60-85	17	17	1-5	27	26	T-1	83	86	50-60	5	4	< 20
Dry Arm															
Silty Steep (2019)	71	71	60-70	4	4	1-5	19	19	5-10	11	11	40-48	11	11	< 25
East Musselshell															
Clayey (2017)	85	55	55-85	15	12	5-10	8	5	1-5	73	46	35-60	4	17	< 20
Finger Buttes															
Clayey (2017)	69	65	55-85	4	9	5-10	8	10	1-5	89	60	35-60	5	9	< 20

Zone ESD (Year)	Grass/Sedge Foliar Cover (%)	Ave Grass/Sedge Foliar Cover for Zone (%)	Grass/Sedge ESD reference (%)	Forb Foliar Cover (%)	Ave Forb Foliar Cover for Zone (%)	Forb Cover ESD reference (%)	Shrub Foliar Cover (%)	Ave. Shrub Foliar Cover for Zone (%)	Shrub Cover ESD reference (%)	Litter Cover (%)	Ave Litter Cover for Zone (%)	Litter Cover ESD reference (%)	Bare Soil (%)	Ave. Bare Soil for Zone (%)	Bare Soil ESD reference (%)
Clayey (2019)	53	65	55-85	19	9	5-10	19	10	1-5	25	60	35-60	11	9	< 20
Coarse Clay (2017)	74	70	30-50	25	18	1-5	7	5	5-10	68	52	15-25	7	9	< 50
Silty (2017)	53	49	60-85	13	15	1-5	12	25	T-1	59	69	50-60	7	4	< 20
Silty (2017)	45	49	60-85	17	15	1-5	37	25	T-1	78	69	50-60	2	4	< 20
Glaciated															
Clayey (2017)	85	85	55-85	10	10	5-10	5	5	1-5	51	51	35-60	3	3	< 20
Sands (2019)	79	79	50-60	13	13	5-10	9	9	1-3	29	29	40-49	5	5	< 20
Silty (2020)	85	85	60-85	13	13	1-5	5	5	T-1	86	86	50-60	2	2	< 20
Glendive															
Clayey (2019)	40	56	55-85	21	17	5-10	0	2	1-5	37	45	35-60	7	7	< 20
Sandy (2019)	52	52	70-85	25	25	5-10	6	6	T-5	14	14	40-50	0	0	< 20
Silty (2017)	94	90	60-85	1	25	1-5	9	11	T-1	55	51	50-60	8	5	< 20
Silty (2017)	67	90	60-85	50	25	1-5	21	11	T-1	76	51	50-60	1	5	< 20
Silty (2020)	123	90	60-85	6	25	1-5	1	11	T-1	55	51	50-60	5	5	< 20
Haxby															
Clayey (2018)	45	64	55-85	16	20	5-10	14	11	1-5	52	63	35-60	24	14	< 20
Clayey (2020)	81	64	55-85	25	20	5-10	8	11	1-5	75	63	35-60	5	14	< 20
Sands (2017)	88	88	50-60	7	7	5-10	2	2	1-3	70	70	40-49	0	0	< 20
Sandy (2017)	70	79	70-85	1	15	5-10	5	9	T-5	51	47	40-50	19	5	< 20
Sandy (2019)	78	79	70-85	5	15	5-10	2	9	T-5	23	47	40-50	17	5	< 20

Zone ESD (Year)	Grass/Sedge Foliar Cover (%)	Ave Grass/Sedge Foliar Cover for Zone (%)	Grass/Sedge ESD reference (%)	Forb Foliar Cover (%)	Ave Forb Foliar Cover for Zone (%)	Forb Cover ESD reference (%)	Shrub Foliar Cover (%)	Ave. Shrub Foliar Cover for Zone (%)	Shrub Cover ESD reference (%)	Litter Cover (%)	Ave Litter Cover for Zone (%)	Litter Cover ESD reference (%)	Bare Soil (%)	Ave. Bare Soil for Zone (%)	Bare Soil ESD reference (%)
Sandy (2019)	80	79	70-85	43	15	5-10	13	9	T-5	33	47	40-50	3	5	< 20
Sandy (2017)	110	79	70-85	25	15	5-10	13	9	T-5	59	47	40-50	1	5	< 20
Silty (2017)	87	78	60-85	0	15	1-5	16	12	T-1	92	69	50-60	1	8	< 20
Silty (2017)	88	78	60-85	4	15	1-5	7	12	T-1	77	69	50-60	1	8	< 20
Silty (2018)	60	78	60-85	37	15	1-5	0	12	T-1	58	69	50-60	6	8	< 20
Silty (2020)	43	78	60-85	13	15	1-5	9	12	T-1	47	69	50-60	33	8	< 20
Silty (2019)	65	78	60-85	7	15	1-5	5	12	T-1	37	69	50-60	23	8	< 20
Silty (2019)	62	78	60-85	36	15	1-5	46	12	T-1	57	69	50-60	2	8	< 20
Silty (2018)	61	78	60-85	11	15	1-5	1	12	T-1	87	69	50-60	1	8	< 20
Silty Steep (2018)	77	77	60-70	10	10	1-5	6	6	5-10	74	74	40-48	6	6	< 25
Knowlton															
Sandy (2019)	86	88	70-85	7	9	5-10	8	6	T-5	53	45	40-50	5	5	< 20
Little Powder River															
Sandy (2017)	87	87	70-85	3	3	5-10	21	21	T-5	95	95	40-50	1	1	< 20
Shallow Clay (2017)	45	45	20-40	3	3	1-5	11	11	10- 15	57	57	20-30	29	29	< 40
Silty (2020)	91	66	60-85	11	15	1-5	1	3	T-1	51	40	50-60	2	16	< 20
Silty (2017)	31	66	60-85	19	15	1-5	7	3	T-1	32	40	50-60	35	16	< 20
Silty (2019)	77	66	60-85	16	15	1-5	1	3	T-1	39	40	50-60	10	16	< 20
Silty Steep (2017)	73	73	60-70	15	15	1-5	16	16	5-10	78	78	40-48	5	5	< 25
Mildred															

Zone ESD (Year)	Grass/Sedge Foliar Cover (%)	Ave Grass/Sedge Foliar Cover for Zone (%)	Grass/Sedge ESD reference (%)	Forb Foliar Cover (%)	Ave Forb Foliar Cover for Zone (%)	Forb Cover ESD reference (%)	Shrub Foliar Cover (%)	Ave. Shrub Foliar Cover for Zone (%)	Shrub Cover ESD reference (%)	Litter Cover (%)	Ave Litter Cover for Zone (%)	Litter Cover ESD reference (%)	Bare Soil (%)	Ave. Bare Soil for Zone (%)	Bare Soil ESD reference (%)
Sandy (2017)	65	85	70-85	2	9	5-10	25	8	T-5	54	74	40-50	10	3	< 20
Missouri Breaks															
Sandy (2020)	81	81	70-85	11	11	5-10	31	8	T-5	80	80	40-50	7	7	< 20
Mizpah															
Claypan (2019)	87	75	30-50	10	17	5-10	8	8	2-10	60	47	5-10	3	7	< 40
Shallow Clay (2020)	47	59	20-40	0	5	1-5	31	23	10- 15	61	51	20-30	27	16	< 40
Silty (2020)	77	69	60-85	8	23	1-5	13	12	T-1	80	62	50-60	7	5	< 20
Silty (2018)	51	69	60-85	19	23	1-5	7	12	T-1	75	62	50-60	3	5	< 20
Silty (2018)	61	69	60-85	28	23	1-5	5	12	T-1	89	62	50-60	0	5	< 20
Silty (2017)	50	69	60-85	14	23	1-5	11	12	T-1	60	62	50-60	13	5	< 20
Silty (2017)	62	69	60-85	33	23	1-5	15	12	T-1	32	62	50-60	6	5	< 20
Silty (2017)	58	69	60-85	39	23	1-5	23	12	T-1	36	62	50-60	4	5	< 20
Very Shallow (2019)	65	65	15-20	8	8	1-5	22	22	15- 25	14	14	10-15	15	15	< 50
Plains															
Clayey (2019)	47	70	55-85	14	12	5-10	15	9	1-5	13	54	35-60	20	10	< 20
Clayey (2018)	56	70	55-85	18	12	5-10	9	9	1-5	55	54	35-60	4	10	< 20
Claypan (2019)	72	72	30-50	9	9	5-10	8	8	2-10	63	63	5-10	9	9	< 20
Shallow Clay (2018)	48	46	20-40	6	18	1-5	3	17	10- 15	24	51	20-30	18	14	< 40
Shallow Clay	47	46	20-40	19	18	1-5	34	17	10-	60	51	20-30	12	14	< 40

Zone ESD (Year)	Grass/Sedge Foliar Cover (%)	Ave Grass/Sedge Foliar Cover for Zone (%)	Grass/Sedge ESD reference (%)	Forb Foliar Cover (%)	Ave Forb Foliar Cover for Zone (%)	Forb Cover ESD reference (%)	Shrub Foliar Cover (%)	Ave. Shrub Foliar Cover for Zone (%)	Shrub Cover ESD reference (%)	Litter Cover (%)	Ave Litter Cover for Zone (%)	Litter Cover ESD reference (%)	Bare Soil (%)	Ave. Bare Soil for Zone (%)	Bare Soil ESD reference (%)
(2017)									15						
Shallow Clay (2017	35	46	20-40	10	18	1-5	22	17	10- 15	61	51	20-30	22	14	< 40
Shallow Clay (2019)	43	46	20-40	36	18	1-5	7	17	10- 15	27	51	20-30	15	14	< 40
Sandy (2019)	85	100	70-85	4	5	5-10	1	28	T-5	79	73	40-50	3	2	< 20
Silty (2020)	77	77	60-85	55	21	1-5	14	17	T-1	92	69	50-60	1	5	< 20
Silty (2018)	63	77	60-85	24	21	1-5	19	17	T-1	85	69	50-60	6	5	< 20
Silty (2020)	57	77	60-85	18	21	1-5	21	17	T-1	64	69	50-60	9	5	< 20
Silty (2020)	80	77	60-85	8	21	1-5	27	17	T-1	72	69	50-60	1	5	< 20
Silty Steep (2018)	47	74	60-70	10	8	1-5	8	6	5-10	60	63	40-48	6	7	< 25
Silty Steep (2017)	60	75	60-71	1	8	1-5	11	6	5-10	77	63	40-48	12	7	< 25
Silty Steep (2019)	86	76	60-72	13	8	1-5	1	6	5-10	71	63	40-48	1	7	< 25
Silty Steep (2019)	63	74	60-70	7	8	1-5	5	6	5-10	46	63	40-48	9	7	< 25
Plevna															
Sandy (2018)	57	57	70-85	29	29	5-10	0	0	T-5	71	71	40-50	5	5	< 20
Silty (2017)	114	88	60-85	17	14	1-5	11	6	T-1	88	71	50-60	0	1	< 20
Silty (2018)	53	88	60-85	37	14	1-5	12	6	T-1	80	71	50-60	0	1	< 20
Silty (2019)	86	88	60-85	17	14	1-5	5	6	T-1	72	71	50-60	1	1	< 20
Silty (2019)	99	88	60-85	1	14	1-5	0	6	T-1	19	71	50-60	1	1	< 20
Silty (2018)	79	88	60-85	11	14	1-5	5	6	T-1	80	71	50-60	1	1	< 20
Silty (2018)	74	88	60-85	7	14	1-5	2	6	T-1	75	71	50-60	2	1	< 20
Silty (2019)	72	88	60-85	26	14	1-5	4	6	T-1	38	71	50-60	3	1	< 20
Silty(2020)	99	88	60-85	14	14	1-5	17	6	T-1	94	71	50-60	1	1	< 20

Zone ESD (Year)	Grass/Sedge Foliar Cover (%)	Ave Grass/Sedge Foliar Cover for Zone (%)	Grass/Sedge ESD reference (%)	Forb Foliar Cover (%)	Ave Forb Foliar Cover for Zone (%)	Forb Cover ESD reference (%)	Shrub Foliar Cover (%)	Ave. Shrub Foliar Cover for Zone (%)	Shrub Cover ESD reference (%)	Litter Cover (%)	Ave Litter Cover for Zone (%)	Litter Cover ESD reference (%)	Bare Soil (%)	Ave. Bare Soil for Zone (%)	Bare Soil ESD reference (%)
Powderville Rd															
Silty (2019)	76	79	60-85	37	25	1-5	10	16	T-1	38	45	50-60	1	5	< 20
Ridge															
Clayey (2019)	77	76	55-85	75	45	5-10	5	16	1-5	41	56	35-60	2	4	< 20
Shallow Clay (2019)	88	88	20-40	26	26	1-5	5	5	10- 15	46	46	20-30	2	2	< 40
Silty (2019)	83	85	60-85	10	40	1-5	0	9	T-1	33	58	50-60	7	3	< 20
Ridgeway Ridge Rd															
Sandy (2019)	54	54	70-85	43	43	5-10	8	8	T-5	39	39	40-50	9	9	< 20
Rosebud															
Saline Upland (2017)	67	67	40-70	9	9	T-5	15	15	5-20	45	45	15-25	17	17	< 5
Saline Lowland (2019)	25	14	10-15	51	34	1-5	4	8	20- 25	27	19	10-15	21	39	< 60
Shallow Clay (2019)	37	37	20-40	5	5	1-5	21	21	10- 15	7	7	20-30	39	39	< 40
Silty (2017)	81	84	60-85	13	23	1-5	15	11	T-1	81	82	50-60	5	6	< 20
Silty (2017)	76	84	60-85	34	23	1-5	31	11	T-1	87	82	50-60	2	6	< 20
Silty (2020)	67	84	60-85	15	23	1-5	13	11	T-1	83	82	50-60	7	6	< 20
Overflow (2019)	77	64	55-70	6	16	1-5	18	9	5-10	39	37	50-60	3	15	< 10

Zone ESD (Year)	Grass/Sedge Foliar Cover (%)	Ave Grass/Sedge Foliar Cover for Zone (%)	Grass/Sedge ESD reference (%)	Forb Foliar Cover (%)	Ave Forb Foliar Cover for Zone (%)	Forb Cover ESD reference (%)	Shrub Foliar Cover (%)	Ave. Shrub Foliar Cover for Zone (%)	Shrub Cover ESD reference (%)	Litter Cover (%)	Ave Litter Cover for Zone (%)	Litter Cover ESD reference (%)	Bare Soil (%)	Ave. Bare Soil for Zone (%)	Bare Soil ESD reference (%)
Unglaciated															
Claypan (2017)	50	50	30-50	13	13	5-10	7	7	2-10	57	57	5-10	13	13	< 40
Clayey (2017)	93	93	55-85	39	39	5-10	7	7	1-5	84	84	35-60	1	1	< 20
Sandy (2019)	63	88	70-85	13	21	5-10	16	13	T-5	33	52	40-50	4	2	< 20
Silty (2019)	57	63	60-85	10	6	1-5	10	13	T-5	21	25	50-60	17	15	< 20
Wildhorse															
Clayey (2017)	60	72	55-85	21	23	5-10	15	13	1-5	39	58	35-60	12	8	< 20
Clayey (2018)	84	72	55-85	24	23	5-10	10	13	1-5	76	58	35-60	4	8	< 20
Silty (2019)	71	80	60-85	9	10	1-5	1	8	T-1	28	71	50-60	20	6	< 20
Silty (2020)	81	80	60-85	8	10	1-5	10	8	T-1	92	71	50-60	0	6	< 20
Silty (2019)	57	63	60-85	10	6	1-5	10	13	T-5	21	25	50-60	17	15	< 20
Wildhorse															
Clayey (2017)	60	72	55-85	21	23	5-10	15	13	1-5	39	58	35-60	12	8	< 20
Clayey (2018)	84	72	55-85	24	23	5-10	10	13	1-5	76	58	35-60	4	8	< 20
Silty (2019)	71	80	60-85	9	10	1-5	1	8	T-1	28	71	50-60	20	6	< 20
Silty (2020)	81	80	60-85	8	10	1-5	10	8	T-1	92	71	50-60	0	6	< 20

Synthesis: RAP and Plot Level

A comparison of grass cover, forb cover, shrub cover, bare soils, and production was made between the existing community using the RAP tool and the community described in the Ecological Site Description. This comparison shows the plant communities on BLM lands are within the reference condition. The RAP was used to identify areas for additional monitoring or treatment as well as showing a numerical trend in percent bare ground and percent cover for vegetation functional groups. This information will direct efforts to more efficiently allocate resources and target practices. Examination of the temporal variability has identified areas undergoing transitions and the degree of that transition, informing the extent of management needed.

Upland health throughout the area is variable and is influenced by a host of factors, including past and present land uses, disturbance (i.e., fire), climatic variables, etc. Within the project area, there are two primary factors for rangelands to be vulnerable to change and/or degradation. The factors are annual precipitation and invasive species.

Climate Change

Although most the project area has had ample precipitation in the past 10-years, it is expected that periodic drought will continue to occur. It is imperative that the BLM continue to both engage with rancher philosophies concerning grazing during and after multi-year droughts and identify mechanisms of rangeland drought resilience. Early planning enables potential alternatives for a plan. Drought increases fire risk (i.e., probability of occurrence)—including an increase in size and possible frequency and/or severity—is expected in the coming years as a result of a) prolonged fire seasons due to extended drought, and b) increased fuel loads from past fire suppression.

According to RAP data after 2009, combined with great plains climate information (Bromely et al., 2020), it appears that early spring moisture has increased annual grass/forb recruitment. This implies that annual plants such as, Japanese brome, cheatgrass, and yellow sweet clover (considered an annual by the RAP) have likely become naturalized components of the environment and will never be eradicated from the mixed grass community.

Invasive Species

Invasive species are defined as a species that are non-native to the ecosystem under consideration and whose introduction causes or is likely to cause environmental harm. Spotted knapweed, leafy spurge, Canada thistle, salt cedar, and ventenata occur in relatively small infestations or as scattered plants through the project area, however cheatgrass and Japanese brome are found in most areas.

Historically, cheatgrass invasion and subsequent effects to wildfire frequency and severity and related sagebrush habitats have not been considered a threat in the MCFO. Resiliency of healthy northern mixed grass prairie plant communities have been illustrated by research at the Agricultural Research Service at Fort Keogh in Miles City. Haferkamp (2001) studying annual bromes including cheatgrass in eastern Montana, anticipated no ecological shift of northern mixed-grass prairies toward annual grass dominance. His research supported the amount and abundance of annual bromes occurring on Northern Great Plains rangeland is cyclic, depending on seedbank, temperature, and amount and distribution of precipitation (Haferkamp, 2001). Furthermore, expansion of annual bromes in mixed–grass prairie communities is buffered by two long-lived perennial grasses (western wheatgrass and blue grama), especially where grazing management maintains healthy native mixed-grass prairie vegetation

(Haferkamp 2001). Vermeire et al. (2011) studied effects of fire on perennial and annual grasses (including cheatgrass) and found increased production of western wheatgrass and decreased annual grass production following summer fire in the northern mixed-grass prairie.

Predicting potential cheatgrass expansion is difficult due to studies implementing different climate models, along with high interannual precipitation of the great plains; although recent models do predict precipitation as the largest influence of cheatgrass expansion (Bradley, 2009; Bradley et al., 2016). Climate change modeling by Bradley (2009) contrasts the maximum potential future cheatgrass expansion scenario with maximum potential future contraction scenario to illustrate and highlight the uncertainty in atmospheric-ocean general circulation models. Bradley's models show, depending primarily on future precipitation conditions, suitable land area for cheatgrass expansion could increase by as much as 45% or decrease by as much as 70% by 2100. The maximum area shown encompasses a large swath of Montana and approximately 50% of the MCFO, however Bradley's median precipitation change scenario (used to identify the most likely future climate change) depicts no increase in cheatgrass climatic habitat within the MCFO.

Another invasive brome, Japanese brome, has poor forage value, is highly competitive, and can displace native species. Favorable weather conditions and the lack of large, perennial bunchgrasses has enabled the persistence and expansion of Japanese brome. Japanese brome is aggressive and competitive with seedlings of perennial plants. Non-native annual grasses can severely decrease the biological diversity of native agronomic habitats by reducing the availability of desirable forage for livestock, degrading wildlife habitats, and hindering recovery from fire.

The uplands in the project area are meeting the described upland standard. This means that at minimum soils are stable and provide for the capture, storage, and safe release of water appropriate to soil type, climate, and landform. The amount and distribution of ground cover for the identified ecological sites are appropriate for soil stability. Ecological processes including hydrological cycle, nutrient cycle, and energy flow are maintained and support healthy biotic populations. Biomass production is near potential and there is a diversity of species characteristic of and appropriate to the sites. The majority of the uplands were rated as being in good to excellent range condition in previous inventories and are considered to be in proper functioning ecological condition. There would be no downward trends in the future by continuing present management. The current grazing management is improving and/or maintaining stable range conditions. The terms and conditions for the grazing permits and leases may be modified if future data collection indicates a revision is warranted to conform with rangeland health standards, or if a change requested by a grazing permittee or lessee is found to be consistent with management objectives.

2.2.5 Recommendations for Uplands

- 1. Identifying mechanisms of rangeland drought resilience management strategies.
- 2. Whenever individual allotments or pastures indicate departure from expected conditions and current grazing management is suspected as a causal factor, continue to implement grazing management changes. This may be done by specifying or changing a season of use, implementing a grazing rotation, and/or changing the management category of the allotment to manage and monitor the allotment more intensively.

- 3. Continue to implement Range Improvement Project Cooperative Agreements with permittees and lessees.
- 4. Continue to implement broadscale noxious weed control on affected allotments.
- 5. Consider constructing, modifying, or removing range improvement projects as needed to improve management and distribute grazing utilization at the site, pasture, and allotment scales. Existing and proposed projects need to incorporate wildlife friendly design to reduce incidental mortality and improve wildlife movements. These projects could include:
 - a. Livestock water (pipelines and tanks, springs, water savers, or reservoirs)
 - b. Fences
 - c. Exclosures
- 6. Consider taking advantage of natural disturbances, such as wildfires, to promote native species establishment and shrub diversity.
- 7. Consider the use of mechanical treatments and/or prescribed fire to:
 - a. Improve range conditions based on historic plant composition and structure.
 - b. Reduce conifer encroachment in sagebrush and grassland habitats.
 - c. Promote understory species diversity and increase deciduous shrubs.
- 8. Consider changes in grazing management to allow for herbaceous regrowth in the same growing season.
- 9. Consider changes in grazing to use areas with extensive annual brome cover.

2.3 Riparian and Wetland Areas

2.3.1 Procedures to Determine Conformance with Standard

Miles City Standard #2: "Riparian and wetland areas are in proper functioning condition."

Riparian-wetland areas are defined as the transition between aquatic areas and adjacent upland areas. These habitats are divided into two general categories: lotic (stream adjacent) and lentic (associated with non-flowing water). Within these two general categories generalize a variety of riparian and wetland types.

BLM policy specifies using several complementary monitoring and evaluation methodologies to evaluate the indicators and determine conformance with the Riparian Health Standard regarding riparian (lotic) and wetland (lentic) areas. The IDT used the Proper Functioning Condition Assessment for Lotic Areas Technical Reference 1737-15 Second Edition (USDI 2015b), also known as Proper Functioning Condition (PFC) Assessment Methodology, to evaluate riparian systems associated with streams. The development and determination of Proper Functioning Condition (PFC) for hydraulic areas on Bureau of Land Management (BLM) areas within the assessment area have been developed by field visits and/or aerial imagery. Figure 5 shows waterbody reaches in the assessment area that have been surveyed for PFC determination. PFC's that were analyzed via aerial imagery were predominately segregated by using the Montana Department of Environmental Quality (MDEQ) 2020 Final Water Quality Integrated Report.

Which was prepared in accordance with the requirements of Section 303(d) and 305 (b) of the federal Clean Water Act. To be included on the 303(d) list, the water quality has been degraded and carries indicators that are the result of natural and/or anthropogenic impact/s.

Proper Functioning Condition assessments were conducted using the above procedure. The streams were divided into lengths on BLM surface with similar physical characteristics that are referred to as "reaches". Approximately 74 reaches, totaling approximately 40 miles of riparian habitat were assessed for PFC. One of five ratings was assigned to each stream reach and wetland area:

- 1) Proper Function Condition (PFC) = Meeting Rangeland Health Standard #2
- 2) Functioning at Risk, Upward Trend = Meeting Rangeland Health Standard #2
- 3) Functioning at Risk, Trend not Apparent = Not Meeting Rangeland Health Standard #2
- 4) Function at Risk, Downward Trend = Not Meeting Rangeland Health Standard #2
- 5) Non-Functioning (NF) = Not Meeting Rangeland Health Standard #2



Figure 5: Waterbody reaches in the assessment area that have been surveyed for PFC determination or assessed by the Montana Department of Environmental Quality.

The majority of the riparian habitats within the project area are intermitted reaches and flow only during certain times of the year when they receive water from springs or from some surface source such as rain or snow melt.

The riparian/wetland areas were assessed for functionality on a stream reach basis. This qualitative process evaluated 17 indicators (e.g., floodplain inundation, stabilizing plant communities, and vertical stability) to assess three interrelated components or attributes of riparian and stream health. These attributes were: hydrology, vegetation, and geomorphology. The indicators are evaluated based on a reference condition which is called the "potential" of a stream reach. It is determined by examining the geology, climate, stream morphology, groundwater elevations, and vegetation conditions. The results of the assessment provide three ratings: 1) Properly Functioning Condition, 2) Functioning at Risk, and 3) Non-functioning.

According to the Proper Functioning Condition Assessment for Lotic Areas Technical Reference 1737-15 (USDI 2015b), a lotic riparian area is in properly functioning condition when adequate vegetation, landform, or woody material is present to:

- Dissipate stream energy associated with high water flow, thereby reducing erosion, and improving water quality
- Capture sediment and aid floodplain development
- Improve flood water retention and groundwater recharge
- Develop root masses that stabilize stream banks against erosion
- Maintain channel characteristics

PFC is a range of conditions (continuum), not a single point.

Functioning at Risk (FAR) in lotic systems means a stream reach is in limited functional condition; however, an existing hydrologic, vegetative, or geomorphic attribute makes it susceptible to impairment. FAR can be further categorized with trend information: upward, downward, static, and not apparent. Trend calls are based on a snapshot in time. The PFC assessment trends can be determined through either "monitoring" such as photos or supplemental detailed inventories or can be based on "apparent" observations and professional judgment at a single point in time. For example, a head cut would cause a downward trend since the system is likely to unravel and incise over time. Non-functioning (NF) means a stream is clearly not providing adequate vegetation, landform, or woody material to dissipate stream energy associated with moderately high flows and thus is not reducing erosion, improving water quality, etc.

The most commonly affected indicators were floodplain inundation; balance of sinuosity, gradient, and width/depth ratios; species indicating maintenance of riparian soil-moisture; adequate amount of stabilizing riparian vegetation; revegetating point bars; lateral and vertical stability; and balance with the water and sediment supply. It should be noted that systems with "low potential" that did not have natural potential to sustain obligate or facultative-wet plant species throughout most of the reach were not surveyed for PFC due to their low sensitivity to management changes.

According to Technical Reference 1737-16 (USDI 2003) "A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas", a lentic riparian area is in properly functioning condition when adequate vegetation, landform, or debris is present to:

• Dissipate energies associated with wind action, wave action, and overland flow

from adjacent sites, thereby reducing erosion and improving water quality

- Filter sediment and aid floodplain development
- Improve flood-water retention and ground-water recharge
- Develop root masses that stabilize islands and shoreline features against cutting action
- Restrict water percolation
- Develop diverse ponding characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, water-bird breeding, and other uses
- Support greater biodiversity

In addition to PFC assessments, several streams that were rated FAR also had Multiple Indicator Monitoring (MIM) completed on key reaches using the protocol outlined in Technical Reference 1737-23 (USDI 2011). Unlike PFC assessments which are used to provide a rating as a snapshot in time, MIM is a quantitative monitoring protocol that addresses multiple short- and long-term indicators to help establish changing trends over time. A variety of indicators are collected including stubble height, woody species use, species composition and cover, streambank alterations (trampling), stability ratings, Ecological Status Ratings, and Site Wetland Ratings.

The Rangeland Health Standards for Riparian areas are met when indicators are at Properly Functioning Condition or Functioning at Risk with an upward trend based on the departure from a reference condition. Riparian areas are not meeting the standard when they are rated as Non-functioning or as Functioning at Risk with a static or downwards trend.

Miles City Grazing Management Guidelines 1, 2, 3, 4, 5, 6, 7, 8, 9, 12 and 14 apply to Standard #2 (USDI 1997).

2.3.2 Affected Environment

The project area contains unique and complex hydrologic systems of stream, prairie wetland, and reservoir features. Healthy riparian-wetland systems reduce flooding, filter, and purify water as it moves through the riparian-wetland zone, reduce sediment loads and enhance soil stability, provide microclimate moderation when contrasted to temperature extremes in adjacent areas, and contribute to groundwater recharge and base flow (USDI, BLM, 1987b).

Within the two general categories of riparian-wetland habitats (lotic and lentic) are a variety of riparian and wetland types. Some are shallow, highly dependent on annual precipitation, and frequently dry out by late summer. Others have sufficient storage capacity to hold water year-round. Based on the Montana Natural Heritage Program Wetland mapping (MNHP 2020), there are over 14,336 acres of mapped riparian-wetland habitat within the project area. The Freshwater Emergent wetlands make up 43 percent of these systems. Freshwater Emergent wetlands are characterized by erect, rooted, herbaceous vegetation present during most of the growing season. In areas with relatively stable climatic conditions, Emergent Wetlands maintain the same appearance year after year. In other areas, strong climatic fluctuations cause them to revert to an open water phase in some years (Stewart and Kantrud 1972). Riparian Forested areas make up approximately 20 percent of the riparian systems. This riparian class has woody vegetation that is greater than 20 feet tall. Forested riparian areas are also associated with floodplains and streams that are important for wildlife habitat. Seventeen percent of the riparian systems are classified as Freshwater Ponds and 15 percent are Riverine Wetlands. Riverine wetlands occur in floodplains and riparian corridors in association with stream channels. Riparian scrubshrub and Floodplains are also present (Figure 6). This type of riparian area is dominated by woody vegetation that is less than 20 feet tall.



Figure 6: Relative distribution of riparian-wetland types located on BLM-administered lands (Montana National Heritage Program, 2020)

The majority of lentic wetlands within the BLM administered portion of the project area are freshwater emergent wetlands and ponds. Most of these acres were mapped in association with man-made reservoirs constructed for watering livestock. There are approximately 2,611 acres directly associated with dammed water from the reservoirs. Additional wetlands have formed below some reservoirs due to seepage. Some naturally occurring wetlands are found within the allotments and typically form from sag ponds or abandon meanders. **Of the few naturally occurring lentic systems, none were classified as non- functioning or functioning at risk.**

Lotic systems are associated with perennial to intermittent or ephemeral streams through the project area. These systems occur along small tributaries of the Yellowstone, Powder, Tongue, and Musselshell Rivers, etc. These systems are found on alluvial soils in highly variable landscape settings, from confined, deep ravines to wide, braided streambeds. The primary inputs of water to these systems include groundwater discharge, overland flow, and subsurface interflow from adjacent upland. Plains cottonwood sometimes become dominant. In wetter systems, the understory is typically willow (*Salix spp.*) with graminoids such as western wheatgrass (*Pascopyrum smithii*) and forbs like American licorice (*Glycyrrhiza lepidota*). In areas where the channel is incised, the understory may be dominated by big sagebrush (*Artemisia tridentatna*) or silver sagebrush (*Artemisia cana*). Riparian systems are often subject to overgrazing and can be heavily degraded, with salt cedar (*Tamarix roamosissima*) and Russian olive (*Eleagnus angustifolia*) replacing native woody vegetation and regrowth. Groundwater depletion and lack of fire have resulted in additional species changes. As with lentic systems within the project area, lotic systems vary in how long they maintain surface water. Streamflow in the area varies seasonally, with the largest flows commonly occurring in the spring or early summer. Geology and soils are a driving factor in determining a stream's potential for vigorous riparian vegetation. The majority of soils within the project area are either fine textured (clayey) developed from Bearpaw or Pierre shale residuum or coarse textured (sandy) weathered from the Judith River Formation or Eagle sandstone. These soils can be highly erosive especially if surface disturbance removes the protective vegetative cover and have limited permanent water near the surface. The Judith River Formation and Eagle sandstone tend to provide more springs/shallow groundwater outcropping.

According to the National Hydrography Dataset (NHD V.210), the BLM portions of the allotments contain approximately 20 miles of perennial streams and 614 miles of ephemeral/intermittent streams. Ephemeral and intermittent stream types can often be found within the same stream depending on geology.

Most of the lotic systems within the project area have been classified as ephemeral systems. Ephemeral drainages flow only in direct response to precipitation events. They receive no water from year-round springs and no long-lasting supply from melting snow or other surface sources. The potential for these streams is limited due to the lack of available water during the growing season. Ephemeral systems do not exhibit characteristics of a riparian-wetland area, do not have visible vegetation or physical characteristics influenced by permanent water, and have been classified as non-riparian.

Streams in the project classified as intermittent are generally due to fluctuations of the water table. The stream channel is below the water table part time and part time is above the water table. However, the water table stays long enough for riparian vegetation to establish. Some intermittent systems do not maintain a water table elevation that is sufficient to sustain obligate plant species and are considered "low potential and non-riparian". Perennial systems flow continuously in all or most years (USDI 2015a) and have the widest diversity of riparian vegetation.

Riparian plant communities in intermittent and perennial streams can be used as indicators for properly functioning condition and vary widely from site to site. A properly functioning riparian plant community is a mosaic of species richness and structure serving to control erosion, shade water, provide thermal protection, filter sediment, aid floodplain development, dissipate energy, delay floodwaters, and increase groundwater recharge where appropriate to landform.

The vegetation potential for most of the intermittent and perennial riparian areas is the shrub and herbaceous riparian complex described by Hansen (1995) for the central and eastern Montana sedimentary and glacial plains. Areas that hold water for an extended time (e.g. pools) would have a common spikerush habitat type in colonizing areas. A three-square bulrush habitat type with small amounts of alkali bulrush habitat type would dominate streambanks. Immediate floodplains would be a western wheatgrass habitat type. Moving upland, this habitat type would transition into a silver sagebrush/western wheatgrass habitat type before becoming upland plant communities. The streamside areas that are saturated for only a short time period would lack the obligate riparian-wetland plant communities on the banks and transition immediately to a western wheatgrass habitat type. The higher terraces adjacent to the floodplains are often dominated by silver sage or greasewood with a grass understory. Some of the larger streams, especially around perennial pools retain enough year-round water to support woody species such as willows, chokecherry, buffaloberry, snowberry, box elder, green ash, and plains cottonwood. The shale-derived soils are considered "fragile" because of extreme physical and chemical properties such as high clay content, low permeability, and very high

surface runoff. Soils tend to be saline and/or sodic within 30 inches of the soil surface. This results in sparse vegetative ground cover even around intermittent streams. Some areas would have a potential more closely described by Hansen (1995) for alkaline communities. These areas would have a cordgrass habitat type with inland salt grass on streambanks before transitioning to western wheatgrass habitat types in higher bank zones.

2.3.3 Analysis and Findings

There are 74 riparian reaches inventoried for a total of about 39.77 miles that were assessed for functional condition. No riparian was rated as non-functioning. The breakdown for stream condition is shown in table Table 10. Of the reaches on the BLM lands that were segregated from the 2020 MDEQ Final Water Quality Integrated Report, 32% of the reaches were determined to be in PFC with an upward trend, 39% were found in PFC with a static trend, and 29% were found to be FAR with an Upward Trend meaning all met or were progressing toward meeting the Riparian Standard. In general, where streams that were Functioning At Risk (FAR) with and upward trend, concerns included: historic alterations of stream morphology, reduced access to floodplains, conifer encroachment, reduced vegetive cover, and limited vegetive species recruitment and regeneration.

PFC Rating	Miles	Percent of Streams Rated
PFC – Upward Trend	12.67	32%
PFC – Static Trend	15.62	39%
FAR – Upward Trend	11.48	29%
Total	39.77	100%

Table 10: PFC ratings for the Miles City Field Office

Due to the vast distances, soil limitations, and the hydrologic regime of the area, the potential of stream systems within the project area widely vary. Not all portions of a stream would be fully functioning even under non-anthropogenic conditions. For example, natural hillside failures supply excess sediment into some stream systems causing the need for the system to rebalance itself over time. Imbalances can be seen in overly shallow and wide channels or head cutting with the development of gravel bars further downstream. Many of the stream systems throughout the project area have developed with these natural disturbances and can "heal themselves" within a relatively short timeframe (< 25 years) or distance downstream if there are no other constant/ongoing disturbances within the drainage. These reaches were still classified as PFC. Approximately 71% of the streams in the BLM administered portions of the allotments were classified as PFC.

Many drainages have impoundments which affects the availability of water, the timing of flows, and the downstream health of riparian vegetation. Some sections of the channel are over-widened and straightened but indicators of recovery, such as lateral migration and a balance of erosion and deposition, were observed. These sections were classified as Functioning at Risk (FAR). Approximately 29% of the streams in the BLM administered portions of the allotments were classified as FAR for a variety of reasons ranging from natural disturbance to historic grazing to current management. Of those stream miles, all have an upward trend. None of the streams on the BLM administered portions of the allotments were classified as NF.

2.3.4 Recommendations for Riparian

- Consider changes in timing, duration, frequency and/or intensity of use as well as number and/or kind of livestock on allotments where there are resource concerns related to current livestock management. Incorporate rest or additional rest into grazing systems to mitigate resource concerns.
- 2. Consider development of off creek stock water systems.
- Continue to implement noxious weed control on affected allotments. Implement riparian specific treatments to control salt cedar and leafy spurge on affected allotments.
- 4. Consider constructing, modifying, or removing range improvements projects as needed to improve management and distribute grazing utilization at the site, pasture, and allotment scales. Existing and proposed projects need to be modified and/or designed to ensure wildlife friendly design to reduce incidental mortality and improve wildlife movements. These projects could include:
 - a. Livestock water (pipelines and tanks, springs, water savers, or reservoirs)
 - b. Fences
 - c. Exclosures
- 5. Improve and/or increase riparian and mesic habitat through a variety of methods including encouraging green ash reestablishment where feasible, stabilize head cuts, hardening streambanks and crossings as appropriate.

2.4 Water Quality

Miles City Standard #3: "Water quality meets Montana State standards."

2.4.1 Procedure to Determine Conformance with Standard

The Federal Water Pollution Control Act, commonly referred to as the Clean Water Act, is the primary federal law governing water quality. Its objective is to restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing or strictly regulating pollution sources. Federal actions must comply with the Clean Water Act of 1972 and Montana State Standards for water quality. The BLM defers to the State of Montana with respect to the rating for this standard. The Montana Department of Environmental Quality (DEQ) prepares a biennial Integrated Report to list the status of water quality for waterbodies under state jurisdiction. This includes the Section 303(d) list of threatened, or "impaired," waterbodies in the state that need Total Maximum Daily Load (TMDL) criteria for pollutants.

In Montana, water quality impairment is more often the result of nonpoint source pollution. Nonpoint source pollution generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage or hydrologic modification. The term "nonpoint source" is defined to mean any source of water pollution that does not meet the legal definition of "point source" in section 502(14) of the Clean Water Act. Montana DEQ has developed a Nonpoint Source Management Plan to provide guidance. One way that the BLM works to implement provisions of the Nonpoint Source Management Plan is through the watershed assessment process and implementation of management and projects. Section 319 of the Clean Water Act addresses nonpoint source pollution through the application of Best Management Practices (BMPs). The BLM uses a variety of BMPs to address nonpoint source pollution resulting from

silviculture, livestock grazing, and road construction and maintenance. Allotment Management Plans (AMPs) are recognized as grazing BMPs to the extent that they address nonpoint source pollution. The BLM uses AMPs developed to improve riparian and upland conditions as an effective BMP to improve water quality. Miles City Guideline #10 states "Livestock management should utilize practices such as those referenced by NRCS published grazing technical guide to maintain, restore, or enhance water quality." Other grazing BMPs used by the BLM include off-stream water, exclosures, and riparian fences.

The BLM's responsibilities under the 1987 amendments of the Clean Water Act include evaluation of the effectiveness of implemented practices. The watershed assessment is an evaluation of BMP effectiveness as well as an evaluation of land health. For this assessment, the IDT used a combination of methodologies to evaluate the watershed characteristics as well as condition and function of streams, floodplains, and riparian areas. In conducting watershed assessments with respect to nonpoint source water pollution, upland, forest, wetland, and riparian assessments are used to determine how BLM management is affecting water quality. The BLM evaluates uplands for land cover condition (ability of plants, rocks, and litter to protect soil from erosion, promote infiltration, and reduce runoff). Wetlands and reservoirs are assessed to determine their extent and condition and their ability to recharge ground water, cycle nutrients, filter sediments, promote infiltration, and mitigate flooding. Streams and their adjacent riparian areas are evaluated to determine channel morphology and stability, access to floodplains, species composition, and condition of riparian vegetation. Wells, pipelines, and spring developments are recognized as BMPs, and are evaluated to determine condition and effectiveness. For the streams within the project area, temperature is not considered an impairment since aquatic life in prairie systems is less sensitive to temperature. However, improvements in channel condition and riparian cover directly correlate to reductions in thermal impacts. The assessment team also looks at timber harvests, abandoned beaver dams, erosion from roads, concentrated livestock waste, and other disturbances that may contribute to nonpoint source pollution. Road maintenance including stream crossings as well as culvert sizes and installations is also evaluated.

Rangeland Health Standard for Water Quality is met when pollutants are below the standards for the Beneficial Use of the designated stream. Miles City Grazing Management Guidelines 1, 6, 7, 8, 10 and 14 (Appendix G) apply to Standard #3 (USDI, 1997).

2.4.2 Affected Environment

Metals are the number one cause of water quality degradation in the region, followed by nutrients, stream alteration, and sediment (Montana 303(d)/305(b) Integrated Report, 2018). The report indicates on 37 of the perennial streams flowing through the BLM administered portions of the allotments, one or more applicable beneficial uses are impaired or threatened. Appendix F details the Montana DEQ determination by stream.

Water quality is often indirectly tied to streamflow as it is largely dependent on the relative contributions of runoff and groundwater. BLM can impact streamflow through development of reservoirs and pits. Likewise, ongoing revegetation of the riparian zone is important for maintaining overall water quality.

2.4.3 Analysis and Findings

Though metals were identified in the Integrated Report as the most common cause of water quality degradation. BLM staff determined that riparian condition was the most impacted indicator of overall

stream health in the BLM administered lands. Most of the reaches within the streams on the 2020 303(d) list were identified as PFC for Standard 3. For many reaches, the risk was due to ongoing impacts from historic grazing and agriculture (crop production).

The reaches within these allotments have relatively little potential contribution to either riparian disturbance or increased sediment levels and therefore met the Water Quality Standard. Montana Department of Environmental Quality (MDEQ) has not made a water quality impairment determination for most of the streams on the BLM administered lands. However, the BLM understands that nonpoint source pollution needs to be addressed for waters of the state regardless of whether they are or are not meeting water quality standards, and non-degradation rules apply to waters that meet state standards. Maintaining riparian health in these reaches will help minimize potential degradation from upstream sources.

2.4.4 Recommendations for Water Quality

- 1. Continue BMP implementation and effectiveness monitoring to address NPS pollution.
- 2. Consider changes in timing, duration, frequency and/or intensity of use, construction of range improvement projects, as well as number and/or kind of livestock on allotments where reaches are impaired for water quality and improvement in riparian vegetation may have a positive impact.
- 3. Improve and/or increase riparian and mesic habitat through a variety of methods including: encouraging riparian vegetation and reestablishment where feasible, stabilizing head cuts, and hardening streambanks and crossings as appropriate.
- 4. Continue implementation of Water Quality MOU (BLM-MOU-MT923-1030) between Montana DEQ and BLM, including submission of biannual reports.
- 5. Continue to implement the Montana Nonpoint Source Management Plan and strategies for Agriculture, Forestry, Mining and Road Maintenance.

2.5 Air Quality

Miles City Standard #4: "Air quality meets Montana State standards."

2.5.1 Procedure to Determine Conformance with Standard

The Clean Air Act (CAA) of 1990, as amended (42 U.S.C. 7401 et seq), and Executive Order 12088 require the BLM to work with appropriate agencies to protect air quality, maintain Federal 42 and State designated air quality standards, and abide by the requirements of State Implementation Plans. The Environmental Protection Agency (EPA) delegated the authority to implement the provisions of the CAA to the State of Montana. Determination of compliance with air quality standards is the responsibility of the State of Montana. To address the issue of wildland fire, the EPA developed the 1998 Interim Air Quality Policy for Wildland and Prescribed Fires which required states to develop smoke management plans.

Montana and Idaho responded by forming the Montana/Idaho Airshed Group and by developing the Montana/Idaho Smoke Management Program. Rangeland Health Standard for Air Quality is met when indicators for smoke contributors from BLM activities are within the EPA's pollutant concentration

established by the National Ambient Air Quality Standards (NAAQS). Air Quality is not meeting the standard when pollutant concentrations from BLM activity exceed the NAAQS.

2.5.2 Affected Environment

The United States EPA has established NAAQS that limit air pollutant concentrations of six principal pollutants (particulate matter, sulfur dioxide, carbon monoxide, nitrogen dioxide, ozone, and lead). The EPA also regulates additional pollutants such as hazardous air pollutants and greenhouse gases (GHGs), although these pollutants have no regulatory thresholds for ambient concentrations.

Under the Clean Air Act Amendments of 1990, the EPA must regularly review and revise the NAAQS, ensure that the standards are attained (in cooperation with states), require control of hazardous air pollutant emissions, and set standards for air quality monitoring. Installation and operation of monitors is primarily carried out by state and local agencies and the monitors are typically located in population centers or near certain industrial sites. Monitors are rare in rural areas, unless air quality agencies have reason to believe that pollutant concentrations may approach or exceed ambient air standards in rural locations.

For most of the year, air quality in eastern Montana is excellent. Air quality issues in the project area develop predominantly during wildfires and are limited to PM2.5 emissions, which can travel hundreds and even thousands of miles. Consequently, air quality in the project area can be affected by fires located far from the Eastern Montana. Because pollutant emissions associated with wildfires are largely beyond human control, exceedances of air quality standards that are associated with large wildfires are considered to be natural events and are typically exempted from consideration when determining NAAQS compliance. Towns larger than a 5,000 people in Eastern Montana are Glendive, Sidney, and Miles City.

2.5.3 Analysis and Findings

Air quality concerns in the project area are primarily related to smoke. Smoke contributors in the project area include wildfire, prescribed fires, private debris burning, agricultural burning, slash burning, and wood burning stoves and fireplaces. Air quality and visibility can deteriorate due to wildfire events, which are most common during the months of July, August, and September. Smoke from wildland and prescribed fires are the primary concerns affecting human health. Prescribed burning is conducted in accordance with the Montana/Dakotas Fire Management Plan and is coordinated with Montana DEQ and the Montana/Idaho Airshed Group. During prescribed fire season, the Smoke Monitoring Unit supports the Montana/Idaho Airshed Group to prevent or reduce the impact of smoke on area communities, especially when that smoke could contribute to a violation of national air quality standards. During the summer wildfire season, the Smoke Monitoring Unit assists state and local governments in monitoring smoke levels and providing information about smoke to the public, firefighters, and land managers. **Authorized activities meet the Air Quality Standard.**

2.5.4 Recommendations for Air Quality

1. Continue to follow burn plans and coordinate with the MT/ID Smoke Monitoring Unit.

2.6 Habitat

Miles City Standard #5: *"Habitats are provided to maintain healthy, productive and diverse populations of native plant and animal species, including special status species (federally threatened, endangered, candidate or Montana species of special concern as defined in BLM Manual 6840, Special Status Species Management)."*

2.6.1 Procedure to Determine Conformance with Standard

This Standard is an overall assessment of diverse native plant and wildlife habitat. The present state of each allotment and habitat type was compared to the natural and historic condition. The indicators described under the definition of Standard #5, as well as condition/function of the other standards, specifically uplands and riparian, were considered to determine whether the Habitat Standard was met. The IDT considered the range of natural variation within these ecosystems landscapes as well as the species composition, condition of available habitat, and forest health to determine the condition/function of biodiversity and wildlife habitat. This included utilizing three sets of information (AIM/LMF and RAP data) and professional judgement to determine standard conformance.

2.6.2 Affected Environment

The assessment area contains a variety of wildlife habitats including mixed grass prairie, sagebrushsteppe, green ash draws, ponderosa pine/breaks, and badland habitats. The area provides seasonal habitats for a wide variety of sagebrush dependent species and other wildlife uses that are enhanced by the interspersion and diversity of sagebrush species, grasslands, riparian habitat, rocky outcrops and small forested areas.

Priority Habitats

Priority habitats include rare vegetation types and those that support threatened or otherwise sensitive or declining wildlife species or a high diversity of native wildlife; these have been addressed in the *Montana Comprehensive Fish and Wildlife Conservation Strategy* (MFWP 2005b). Four priority habitats have been identified in the assessment area: sagebrush, native grasslands, riparian and wetlands, and crucial big game winter range. These habitats are generally distributed across the assessment area (Tables 11 and 12).

Habitat	Key Associated Wildlife			
Sagebrush	Sage-grouse, big game, loggerhead shrike, Brewer's sparrow, sage thrasher, and lark sparrow			
Native grasslands	Black-tailed prairie dog, mountain plover, ferruginous hawk, northern harrier, burrowing owl, Sprague's pipit, Baird's sparrow, and sharp- tailed grouse			
Riparian and wetlands	Bald eagle, piping plover, mountain plover, and amphibians			

Table 11: Priority habitats and associated wildlife in the project area

Habitat	Key Associated Wildlife
Big game crucial winter range (winter range consists of various habitat types, including sagebrush)	Mule deer, white-tailed deer, pronghorn antelope, bighorn sheep, and Rocky Mountain elk

Priority Wildlife Species

Priority wildlife species are game animals and non-game species of special interest (MFWP 2005b). The latter species include species of public interest, species associated with rare habitats, species with the potential to be sensitive to management activities, species with a unique role in the ecosystem, or those species with a low abundance or declining population.

Table 12: Existing conditions and habitat for priority wildlife species in the project area

Species	Occurrence in the	General Habitat	Trends in Area Abundance
	Assessment area	Associations	
Mule deer	Most abundant big game	Use a wide variety of	Exhibit some population fluctuations
	species	habitats, but generally	depending on harshness of winter
		prefer sagebrush, grassland,	and summer drought, but overall
		and conifer areas	population levels are high.
White-tailed deer	Well distributed throughout	Prefer riparian drainage	Same as mule deer above.
	suitable habitat	bottoms and conifer forests	
Pronghorn antelope	Second most-abundant big	Use grasslands, sagebrush	Information is not available.
	game species	and other shrub-grasslands,	
		and agricultural fields	
Rocky Mountain elk	Common in the Missouri Breaks	Use grasslands, shrub-	Statewide, increased from 55,000 in
	areas, less common in southern	grasslands, woodlands, and	1978 to 130,000 to 160,000 in 2004.
	portion of the assessment area	riparian and wetlands	Overall populations are increasing
			throughout the assessment area.
Bighorn sheep	Occur as a single herd (in the	Use cliffs, mountain slopes,	Information is not available.
	Powder River Breaks area)	and rolling foothills with	
		open to semi-open	
		conditions (i.e., rocks,	
		grasses, shrubs) Often use	
		southerly aspects	
Upland game birds: ¹ sharp-	Generally well distributed	Sharp-tailed grouse use	Sharp-tailed grouse populations
tailed grouse, wild turkey, ring-	throughout suitable habitat	grasslands, shrub-	fluctuate yearly in abundance.
necked pheasant, gray		grasslands, woodlands,	Increased grain production since the
partridge		riparian and wetlands, and	1940s has caused an increasing gray
		agricultural areas.	partridge population in the state.
		Wild turkey use forested	
		riparian areas, ponderosa	
		pine hillsides, and	
		agricultural fields.	
		Ring-necked pheasant use	
		riparian bottoms with	
		adjacent agricultural fields.	
		Gray partridges use	
		grasslands with interspersed	
		agricultural fields and brushy	
		or weedy areas.	
Waterfowl	Well distributed throughout	Use reservoirs, wetlands,	Information is not available.
	suitable habitat	and rivers	
Amphibians (tiger salamander,	Not well known	Use riparian and wetland	The northern leopard frog population
Woodhouse's toad, and boreal		areas	west of the Continental Divide has

chorus frog) and painted turtle		been declining; trends east of the
		divide are not known. Information for
		other species is not available.

¹Sage-grouse are addressed in the Special Status Species Section.

Big Game

Big game species in the assessment area include mule deer, white-tailed deer, pronghorn antelope, Rocky Mountain elk, and bighorn sheep.

Mule deer (*Odocoileus hemionus*) are the most abundant big game species in the assessment area and use the greatest variety of habitats. Most of the assessment has areas of year-round mule deer distribution. Approximately 384,697 BLM acres of crucial winter range occur in the assessment area.

In eastern Montana, most mule deer and elk winter range is located on relatively large areas of land with a diversity of slopes, aspects, and topographic features. Winter range is often part of year-round habitat. Winter ranges are typically in areas of rough topography and are often dominated by shrub species that provide crucial browse. Breaks, badlands, and brushy draws are preferred in open prairie country. MacCracken and Uresk (1984) reported that both hardwood and pine forests were important to mule deer in southeastern Montana, with hardwood forests preferred. Escape and thermal cover are also important for maintenance and survival. Doghair stands of ponderosa pine and juniper are examples of important escapes and thermal cover used by mule deer throughout the assessment area. Habitat such as riparian bottoms, agricultural areas, and forests are used as well, either yearlong or seasonally.

Throughout the assessment area, mule deer use all habitat types, but generally prefer sagebrush, grassland, and conifer (BLM 1984). Broken terrain provides important cover in these habitats. Browse is an important component in the mule deer annual diet. Montana Department of Fish, Wildlife and Parks (MFWP) observations (Youmans and Swenson 1982) indicate that 73 percent of the mule deer seen in winter concentration areas in southeastern Montana were in rough topography, particularly in pine-dominated habitats. Along the Powder and Little Missouri rivers, however, riparian habitat accounted for 94 percent of the wintering mule deer concentrations, probably due to the lack of rough breaks. These habitats are crucial to herd survival in the Powder River area, and there appears to be little or no seasonal migration of mule deer in southeastern Montana (BLM 1984).

Mule deer populations have declined and rebounded at least twice since the late 1970s. The population peaked in the early 1980s and then declined for approximately 5 years because of drought, poor winter survival, and liberal harvests (BLM 1995). Recent MFWP survey data for mule deer in the assessment area indicated a 16 percent decrease from the long-term average in 2010 (H. Burt, personal communication, February 4, 2011). The fawn to adult ratio also showed decreases: the 10-year average (2000 to 2009) for fawn to adult ratio was 58.5 fawns per 100 adults and the 2010 survey showed 40 fawns per 100 adults (H. Burt, personal communication, February 4, 2011).

Although less abundant than mule deer, white-tailed deer (*Odocoileus virginianus*) are common in the assessment area. White-tailed deer prefer riparian drainage bottoms and conifer areas, but they will also use a variety of other habitats. Areas of highest white-tailed deer concentration (more than 30 deer per square mile) total close to half a million acres, including approximately 4 percent of BLM-administered lands (MFWP 2005b). BLM-administered lands provide less than 1 percent of the more
than 2.64 million acres of white-tailed deer winter range in the assessment area.

During the winter, white-tailed deer using forested areas prefer dense canopy classes, moist habitat types, uncut areas, and low snow depths. Suitable winter range is a key habitat factor for white-tailed deer, and winter concentration areas occur almost exclusively in riparian and wetland habitats and dense pine (Youmans and Swenson 1982). Although white-tailed deer move on and off winter range, as dictated by seasonal habitat requirements, the animals do not migrate for long distances. The white-tailed deer population remains relatively consistent, despite periodic outbreaks of epizootic hemorrhagic disease, a non-contagious viral disease characterized by extensive hemorrhaging.

Pronghorn antelope (*Antilocapra americana*) are the second most-abundant big game species in the assessment area. Although these animals are generally associated with grasslands and shrublands, they will also use agricultural fields.

Approximately 11 percent of pronghorn antelope habitat in the assessment area occurs on BLMadministered lands. BLM-administered lands also provide winter range for the species in the assessment area.

Rocky Mountain elk (*Cervus canadensis*) are associated with grasslands, shrublands, woodlands, and riparian and wetlands. The species is also common in the Missouri Breaks and scattered throughout the Custer National Forest including surrounding BLM-administered lands south of Miles City to the Wyoming and South Dakota borders. Summer habitat is located primarily in the southern portion of the assessment area while winter habitat is concentrated on the western border along the Musselshell River. Elk are expanding throughout the assessment area, especially in portions of Big Horn and Powder River counties (and small portions of Custer County). Overall numbers are also increasing throughout the assessment area.

Bighorn sheep (*Ovis canadensis*) in the assessment area occur as a single herd and occupy a portion of 388,388 acres of habitat, located primarily in the Powder River Breaks area in Custer County. Occasionally, they are also observed in the Pine Hills area. Approximately 18 percent of the occupied area occurs on BLM-administered lands. Bighorn sheep habitat includes cliffs, mountain slopes, and rolling foothills with open to semi-open conditions (i.e., rocks, grasses, shrubs).

Game Birds

Upland game birds in the assessment area include sharp-tailed grouse (*Tympanuchus phasianellus*), greater sage-grouse, wild turkeys (*Meleagris gallopavo*), ring-necked pheasants (*Phasianus colchicus*), and gray partridges (*Perdix perdix*). The greater sage-grouse is considered a special status species and addressed further in Special Status Species, Fish and Wildlife. As with big game, upland game birds are considered priority species because the public expresses interest in hunting these species. BLM-administered lands provide approximately 11 to 13 percent of the habitat or distribution of upland game birds in the assessment area. However, BLM-administered lands contain only 2 percent of the ring-necked pheasant habitat in the assessment area.

The primary threats to upland game bird populations in the assessment area include habitat loss and adverse weather. Hunting can also affect upland game bird populations. However, as with big game, MFWP, regulates the amount of upland game bird hunting allowed and prevents hunting from exerting an undesirable effect on these populations. Approximately 1,483 sharp-tailed grouse lek sites have been

located and mapped in the assessment area, with 14 percent occurring on BLM-administered lands and 74 percent on private land.

Non-game Wildlife

Various non-game priority species occur in the assessment area. Those that are federally listed or considered sensitive species by the BLM are discussed in the Special Status Species, Fish and Wildlife section. Because they are sensitive to environmental conditions and associated with rare habitat (wetlands and riparian areas), amphibians and turtles are also priority species groups; however, global population declines of some species and limited knowledge regarding occurrence and distribution of these species in the assessment area also contribute to this classification. Amphibians and turtles (other than those addressed in the Special Status Species section) known or expected to occur in the area are discussed above in the Fish and Wildlife, Aquatics section.

Key threats to amphibians and turtles in the project area include loss of riparian and wetland habitats, alteration of these habitats (through fragmentation, changes in hydrology, erosion, and changes in riparian and aquatic vegetation), and effects from environmental contaminants.

Special Status Species, Terrestrial

Special status species include species:

- proposed for listing, listed as threatened or endangered, or considered candidates for listing as threatened or endangered under the provisions of the ESA;
- listed by a state in a category such as threatened or endangered, implying potential endangerment or extinction; and
- those designated sensitive species by a BLM state director.

Conservation of special status species means the use of all methods and procedures necessary to improve the condition of special status species and their habitats to a point where special status recognition is no longer warranted.

Special status species are plants and animals that require particular management attention due to population or habitat concerns. These species are either:

- federally listed threatened and endangered species (or these species' designated critical habitats);
- federally proposed species and proposed critical habitats;
- federal candidate species;
- species designated as threatened or endangered species by the state; or
- Montana BLM Sensitive Species.

The BLM coordinates its threatened and endangered species management with the USFWS and MFWP. The BLM initiates Section 7 consultation with the USFWS before approving or implementing any action that may affect listed species or designated critical habitat. Streamlined consultation procedures detailed in the July 27, 1999 memorandum of agreement and subsequent implementation guidance for Section 7 consultations are

utilized to provide collaborative opportunities in the consultation process. The BLM has entered into a MOU with the USFWS to improve the efficiency and effectiveness of RMPlevel Section 7 consultation processes under the ESA. The BLM agrees to promote the conservation of candidate, proposed, and listed species and to consult informally and formally on listed and proposed species (and designated and proposed critical habitat) during planning to protect and improve the condition of species and their habitats to a point where their special status is no longer necessary.

Federally listed species may have critical habitat considered crucial to species viability. For those listed species without critical habitat designation, the BLM cooperates with the USFWS to determine and manage important habitats. Protective measures for migratory birds are provided in accordance with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. 668–668d). Other fish and wildlife resources are considered under the Fish and Wildlife Coordination Act of 1934 (16 U.S.C. 661 et seq.).

Special status species indicators reflect population levels, distribution, and quantity and quality of preferred and suitable habitat and the prey needed to support them. This includes a healthy genetic pool needed for adaptability to future circumstances and conditions, as well as, critical breeding habitat, wintering grounds, and corridors needed to support migrations. Indicators are detected through allotment evaluations, stream and vegetation monitoring, population surveys, the MNHP database, field observations, and USFWS data.

This section addresses the existing conditions of special status species habitat in the assessment area by those special status wildlife species known to occur or considered likely to occur in the assessment area (Table 13). Although present historically, the ESA-listed grizzly bear (*Ursus arctos*) no longer occurs in the assessment area. Numerous migratory bird species are considered BLM Sensitive Species and are a special status group. Included in the bird species are USFWS Birds of Conservation Concern, which have been identified as species that, without additional conservation actions, are likely to become candidates for listing under the ESA and are in greatest need of conservation action. (This list has been updated from the 2002 Birds of Conservation Concern List.)

Species	USFWS Status	BLM Sensitive
Mammals		
Northern Long-eared Bat	Threatened	Yes
Black-tailed prairie dog	None	Yes
Swift fox	None	Yes
BLM-listed sensitive bats ²	None	Yes
Birds		
Long-billed curlew	BCC	Yes
Willet	None	Yes

Table 13: Special status wildlife species known or likely to occur in the project area

Species	USFWS Status	BLM Sensitive
Wilson's phalarope	None	Yes
Greater sage-grouse	BCC	Yes
Burrowing owl	BCC	Yes
Bald eagle	BCC	Yes
Golden eagle	None	Yes
Ferruginous hawk	None	Yes
Peregrine falcon	None	Yes
Northern goshawk	None	Yes
Sage thrasher	BCC	Yes
Sprague's pipit	BCC	Yes
Loggerhead shrike	BCC	Yes
Chestnut-collared longspur	BCC	Yes
McCown's longspur	BCC	Yes
Baird's sparrow	BCC	Yes
Brewer's sparrow	BCC	Yes
Horned grebe (Podiceps auritus)	BCC	No
American bittern (Botaurus	BCC	Yes
lentiginosus)		
Prairie falcon (Falco mexicanus)	BCC	No
Upland sandpiper (Bartramia	BCC	No
longicauda)		
Black-billed Cuckoo (Coccyzus	BCC	No
erythropthalmus)		
Short-eared owl (Asio flammeus)	BCC	No
Lewis's woodpecker (Melanerpes	BCC	Yes
lewis)		
Red-headed woodpecker (Melanerpes	BCC	No
erythrocephalus)		
Pinyon jay (<i>Gymnorhinus</i>	BCC	Yes
cyanocephalus)		
Sage sparrow (Amphispiza belli)	BCC	No
Grasshopper sparrow (Ammodramus	BCC	No
savannarum)		
Dickcissel (Spiza americana)	BCC	No
Amphibians		
Great Plains toad	None	Yes
Northern leopard frog	None	Yes
Plains spadefoot toad	None	Yes
Reptiles		
Snapping turtle	None	Yes
Spiny softshell turtle	None	Yes
Greater short-horned lizard	None	Yes
Milksnake	None	Yes
Western hog-nosed snake	None	Yes
Fish		

Species	USFWS Status	BLM Sensitive
Blue sucker	None	Yes
Northern red-belly x finescale dace	None	Yes
hybrid		
Paddlefish	None	Yes
Pallid sturgeon	Endangered	Yes
Pearl dace	None	Yes
Sauger	None	Yes
Sturgeon chub	None	Yes

The table includes USFWS BCC (Bird Conservation Regions 11 and 17) and BLM Sensitive Species ¹Delisted taxon, recovered, being monitored first five years

²Townsend's big-eared bat, spotted bat, Hoary, fringed myotis, eastern red bat ³Birds of conservation concern

Sources of information for this section include GIS data from BLM, MFWP, the Miles City Field Office RMPs, communications with regional biologists (BLM, USFWS, and MFWP), and a literature review.

Mammals

The black-footed ferret (*Mustela frenata*) was listed as an endangered species in 1967 under a precursor to the ESA. The main causes of the species' decline included habitat conversion for farming, intentional efforts to eliminate prairie dogs (black-footed ferrets depend almost exclusively on prairie dogs for food and shelter), and disease (USFWS 2000). A captive breeding and reintroduction program was established for the animals, and the current USFWS goal is the establishment of 10 free-ranging populations of ferrets spread over the widest possible area within their former range.

Historic records documented black-footed ferret occupation of habitat within the assessment area but black-footed ferrets are not known to occupy habitat on BLM-administered lands at this time. There is a low probability that a relict population may occur, although this has not been detected in area surveys to date. Black-footed ferret reintroductions occurred on the Northern Cheyenne Reservation in 2009; however, based on geographical constraints and limited connective habitat, the probability that black-footed ferrets from this reintroduction site will migrate to BLM-administered lands within the assessment area is low.

Birds

Numerous migratory bird species exist in the assessment area including Special Status Species (Table 16). On June 28, 2007, the bald eagle *(Haliaeetus leucocephalus)* was removed from the federal list of threatened and endangered species but bald eagles are still protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. In the western United States, bald eagle abundance has been increasing in recent years (USFWS 1999b). Bald eagles generally occur along rivers and lakes with abundant fish and waterfowl prey and adjacent large trees for nesting and roosting. In the assessment area, bald eagles commonly nest along the Yellowstone River in Rosebud, Prairie, Custer, and Treasure counties. One active bald eagle nest site, on Howrey Island in Treasure County, is present on BLM-administered lands near the assessment area. During spring and fall migration and winter, bald eagles use the Yellowstone, Missouri, Tongue, Musselshell, and Powder rivers; wintering bald eagle use is particularly high at Fort Peck Reservoir along the Missouri River (MFWP and MNHP 2006).

Some of the more common songbird species in the assessment area include brewers, grasshopper sparrow, and Sprague's pipit. The Sprague's pipit (Anthus spragueii) selects prairies with grasses of intermediate height and may require relatively large areas (approximately 170 acres in a study in Saskatchewan) of appropriate habitat (MFWP and MNHP 2006). Main threats to the species include habitat loss and alteration caused by agriculture and overgrazing (MNHP et al., 2006). Sprague's pipits were found warranted but precluded by higher priority actions for listing as a threatened or endangered species (USFWS 2010b). Although Sprague's pipits are rarely found in cropland or CRP land, they have been found to use nonnative planted grassland (USFWS 2010b). The USFWS (2010b) reports that pipit occurrence may be better predicted using vegetation structure rather than composition. The Montana Bird Distribution database has documented observations of Sprague's pipits in Daniels, Sheridan, Roosevelt, McCone, Richland, Dawson, Prairie, Custer, and Fallon counties within the assessment area (MNHP et al. 2006). BLM biologists have observed Sprague's pipits in Carter County and Prairie County. Historical observations have also been documented for Wibaux and Big Horn counties (Lenard, Carlson, Ellis, Jones, and Tilly 2003).

Other BLM Sensitive Species

In the assessment area, black-tailed prairie dogs (*Cynomys ludovicianus*) occur in grassland and shrub grassland habitat. A model based on vegetation biomass, slope, and soils resulted in four vegetation types identified as preferred by prairie dogs: very low cover grasslands, salt-desert shrub, dry salt-flats, and mixed barren sites. Prairie dogs were found to be associated with slopes of 0 to 4 percent (Proctor, Beltz, and Haskins 1998).

Black-tailed prairie dogs provide unique habitat for a variety of prairie wildlife species and are considered a "keystone species" (a species and habitat depended on by numerous other wildlife species for forage and reproduction). Their potential decline from control, fragmentation, and plague may cause secondary declines to other species including special status species such as burrowing owls, mountain plovers, and ferruginous hawks. The existence of the secondary species hinges on maintaining viable populations of prairie dogs throughout its range. Black-tailed prairie dogs were once listed as a candidate species for listing under the ESA but were found not warranted for listing by the USFWS.

Black-tailed prairie dogs declined in abundance during the 1900s and the current estimated acreages of occupied habitat is considered much less than historic. Declines are attributed to intensive eradication programs, conversion of native rangelands, and sylvatic plague. In the assessment area, black-tailed prairie dog colonies occupy approximately 76,900 acres, which includes Northern Cheyenne Tribal lands. Black-tailed prairie dog colony occupation on BLM-administered lands is estimated at approximately 5,618 acres. These estimates are

based on a combination of the most recent surveys available from 2003 to 2004.

Thought to be common on Montana's eastern plains throughout the early 1900s, swift fox (*Vulpes velox*) were believed to be extinct by 1969, which was largely attributed to poisoning (MFWP and MNHP 2006). In recent years, the swift fox population has appeared to be expanding into Montana from Canada. Occurring in shortgrass and midgrass prairies, surveys and trapping/collaring projects conducted in Montana indicate swift foxes occur primarily in the north-central and northeastern portion of the state (Grenier 2003). Collaring and tracking adult and juvenile swift foxes to determine habitat use, dispersal and general movement behavior is on-going with trapping locations in Carter, Garfield, Fallon and Bighorn Counties. The primary ongoing threat to swift foxes in Montana is competition with coyotes and red foxes (MFWP and MNHP 2006).

The BLM considers five bat species occurring in the assessment area to be sensitive species: Townsend's big-eared bats (*Corynorhinus townsendii*), spotted bats (*Euderma maculatum*), fringed myotis (*Myotis thysanodes*), and northern myotis (*Myotis septentrionalis*). Bats are sensitive to disturbance at their roosting sites; the availability of suitable roosting sites (e.g., tree cavities, tree bark, caves, rock crevices, mines, and buildings), are key habitat components for these bats (Nagorsen and Brigham 1993).

The greater sage-grouse occurs across 11 Western states, including portions of the assessment area (Figure 7). Based on available genetic and ecological data, the USFWS determined that the western subspecies was not a valid subspecies; subsequently, it is considered a single species across its range (2005d). In cooperation with MFWP, the University of Montana, and the Adopt-A-Lek Program, the BLM is working towards gaining a better understanding of the genetic connectivity of groups of sage-grouse across their Montana range. Genetic testing from feather samples can be used to determine consanguinity of birds within and between lek complexes or designated core habitats. Similar testing is underway in North Dakota, South Dakota, and Wyoming.

Sage-grouse are native to the sagebrush steppe of western North America, and their distribution closely follows that of sagebrush, primarily big sagebrush (Montana Sage Grouse Work Group 2005). The importance of mature sagebrush with a good understory of grasses and forbs is well documented. In eastern Montana and throughout the assessment area where close interspersion of wintering, nesting, breeding, and brood-rearing habitat rarely require large seasonal movements, sage-grouse are essentially non-migratory.

Primary ongoing threats to sage-grouse include habitat loss, fragmentation, and deterioration as a result of factors including the spread of invasive species, infrastructure development, rapidly expanding energy development, wildfire, and conifer invasion (USFWS 2005d). There are approximately 1.23 million acres of sage-grouse habitat in the assessment area (BLM acres).

Specific objectives for sage-grouse that include maintaining and increasing, where possible, present distribution and abundance of sage-grouse are addressed in the Greater Sage-grouse Comprehensive Strategy Memorandum of Understanding to which BLM was a signatory (Stiver et al. 2006). The BLM's *National Sage-grouse Conservation Strategy* (BLM 2004h) and the statewide *Management Plan and Conservation Strategies for Sage Grouse in*

Montana (Montana Sage Grouse Work Group 2005) are the primary guides for current management of sage-grouse habitat on BLM-administered lands. Both plans provide broad goals for sage-grouse conservation, management, and specific actions to accomplish these goals. The BLM is an active participant in the Montana Sage Grouse Work Group, a cooperative membership of state, federal, tribal, private entities, and several individuals from the general public that developed the statewide plan.

The habitat objectives in Table 14 summarize the characteristics that research has found represent the seasonal habitat needs for GRSG (Table 2-6, MCFO ARMP, September 2015). The specific seasonal components identified in the Table were adjusted based on local science and monitoring data to define the range of characteristics used in this subregion. Thus, the habitat objectives provide the broad vegetative conditions we strive to obtain across the landscape that indicate the seasonal habitats used by sage-grouse. These habitat indicators are consistent with the rangeland health indicators used by the BLM.

The habitat objectives will be part of the sage-grouse habitat assessment to be used during land health evaluations (see Monitoring Framework Appendix in MCFO ARMP, September 2015) which includes this assessment. These habitat objectives are not obtainable on every acre within the designated management zones. Therefore, the determination on whether the objectives have been met will be based on the specific site's ecological ability to meet the desired condition identified in the table.

All BLM use authorizations will contain terms and conditions regarding the actions needed to meet or progress toward meeting the habitat objectives. If monitoring data show the habitat objectives have not been met nor progress being made towards meeting them, there will be an evaluation and a determination made as to the cause. If it is determined that the authorized use is a cause, the use will be adjusted by the response specified in the instrument that authorized the use.

ATTRIBUTE	INDICATOR	DESIRED CONDITION
BREEDING, NESTIN	IG AND EARLY BROOD-REARING (Sease	onal Use Period March 1-June 15)
	Proximity of trees ¹	.65– Km2 (.388 miles) avoidance of coniferous habitats
Lek Security	Drovinity of cogobrush to loks ²	Adjacent protective sagebrush cover within 328 ft. (100
	Proximity of sagebrush to leks	m) of an occupied lek
		80% of the nesting habitat within 3.1 miles of GRSG leks
	% of seasonal habitat meeting	meets the recommended vegetation characteristics,
	desired conditions ^{2, 3}	where appropriate (relative to ecological site potential,
		etc.)
	Sagebrush canopy cover ^{4, 5, 6, 7, 8, 9, 10,}	5-25%
	Sagebrush height ^{5, 8, 9, 12, 13}	6-31 inches (15-50cm)
Cover	Predominant sagebrush shape ²	Predominately spreading shape
	Perennial grass cover (such as western wheatgrass) ^{6, 7, 8, 9, 13}	≥10%
	Perennial grass and forb height	Adequate nest cover based on ecological site potential
	(includes residual grasses) ¹⁴	and seasonal precipitation; 4.4-11.3 inches (11.4-29 cm)
	Perennial forb canopy cover ^{6, 7, 8, 9, 13}	≥3%

Table 14: Miles City Field Office RMP GRSG habitat objectives

ATTRIBUTE	INDICATOR	DESIRED CONDITION
BREEDING, NESTIN	IG AND EARLY BROOD-REARING (Seas	onal Use Period March 1-June 15)
BROOD-REARING/	SUMMER ¹ (Seasonal Use Period June	16-October 31)
	% of Seasonal habitat meeting desired condition ²	>40% of the brood-rearing/summer habitat meets recommended brood habitat characteristics where appropriate, relative to site potential and seasonal precipitation.
Cover	Sagebrush canopy cover ^{4, 5, 6, 7, 8, 9, 10}	5-25%
Cover	Sagebrush height ^{8, 9, 12, 13}	6-31 inches (15-50cm)
	Perennial grass canopy cover and forbs ^{6, 7, 8, 9, 13}	≥10%
	Riparian areas/mesic meadows ^{15, 16, 17}	Proper Functioning Condition
	Upland and riparian perennial forb availability ^{2, 8, 9}	Preferred forbs are common with several preferred species present.
WINTER ¹ (Seasona	I Use Period November 1-February 28	
Cover and Food	% of seasonal habitat meeting desired conditions ²	>80% of wintering habitat meets winter habitat characteristics where appropriate (relative to ecological site, etc.)
Cover and Food	Sagebrush canopy cover above snow ^{5,10,12}	>10%
	Sagebrush height above snow ^{8, 9, 12}	6-31 inches (15-50cm)

¹Doherty, K.E. 2008. Sage-grouse and Energy Development: Integrating Science with Conservation Planning to Reduce Impacts. Doctoral dissertation, the University of Montana (Missoula). Available at: http://etd.lib.umt.edu/theses/available/etd-03262009-132629 /unrestricted /doherty.pdf.

²Stiver, S. J., E. T. Rinkes, D. E. Naugle, 2010. *Sage-Grouse Habitat Assessment Framework*. U.S. Bureau of Land Management, Idaho State Office, Boise, Idaho.

³Knick, S.T. and J.W. Connelly, 2011. Greater Sage-grouse, Ecology and Conservation of a Landscape Species and its Habitats. Studies in Avian Biology No. 38. A Publication of the Cooper Ornithological Society, University of California Press. Berkeley. pp. 1–9.

⁴Herman – Brunson, K.M. 2007. Nesting and Brood-rearing success and habitat selection of Greater Sage-Grouse and associated survival of hens and broods at the edge of their historic distribution. M.S. thesis, South Dakota State University, Brookings, SD.

⁵Swanson, C.C. 2009. *Ecology of Greater Sage-grouse in the Dakotas*. Doctor of Philosophy, South Dakota State University, Brookings, SD.

⁶Doherty, K.E., Naugle, D.E., Walker, B.L. 2010. Greater Sage-Grouse Nesting Habitat: The Importance of Managing at Multiple Scales. The Journal of Wildlife Management 74 (7):1544-1553. 2010

⁷Hagen, C.A., Connelly, J.W., Schroedeer, M.A. A Meta-analysis of Greater Sage-grouse Centrocercus urophasianus Nesting and Brood-rearing Habitats. Wildlife Biology, 13 (sp1):42-50. 2007

⁸Doherty, K.E., Beck, J.L., Naugle, D.E. 2011. Comparing Ecological Site Descriptions to Habitat Characteristics Influencing Greater Sage-Grouse Nest Site Occurrence and Success. Rangeland Ecol Management 64:344-341 1 July 2011 1 DOI:10.2111?REM-D-10-00120.1

⁹USDA, NRCS, Montana, *Ecological Site Descriptions*. Accessed January 28, 2014. Available at: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/mt/technical/landuse/pasture/?cid=nrcs144p2 057024

¹⁰Foster, M.A, Ensign, J.T., Davis, W.N., Tribby, D.C. 2014. *Greater Sage-Grouse in the Southeast Montana Sage-Grouse Core Area.* Montana Fish, Wildlife and Parks (FWP) in Partnership with USDI Bureau of Land Management. Miles City, MT.

¹¹Wright, P. and Wegner, D. 2008. Mapping Land Cover to Estimate Sage Grouse Habitat Within the Cedar Creek Anticline and Surrounding Study Area. Contract with Bureau of Reclamation. Technical Memorandum No. 86-68211-09-02. Remote Sensing and GIS Team, Technical Service Center, Bureau of Reclamation. Denver, CO.

¹²Schroeder et al. 1999. Greater Sage-Grouse (Centrocercus urophasianus) [Website], The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Accessed February 22, 2011. Available at: Birds of North America Online: http://bna.birds.cornell.edu/bna /species/425/articles/introduction

¹³Holloran, M.J., Heath, B.J., Lyon, A.G. 2005. Greater Sage-Grouse Nesting Habitat Selection and Success in Wyoming. Journal of Wildlife Management 69 (2):638-649. 2005

¹⁴K.E. Doherty, K.E. Naugle, J.D. Tack, B.L.Walker, J.M.Graham and J.L. Beck. *Linking conservation actions to demography: grass height explains variation in greater sage-grouse nest survival.* Wildlife Biology 20 (6):320-326. 2014

¹⁵BLM, 1997c. Record of Decision for Standards for Rangeland Health and Guidelines for Livestock Grazing Management Final Environmental Impact Statement for Montana and North and South Dakota. August 7, 1997. BLM, Montana State Office. Billings.

¹⁶Prichard, D., F. Berg, S. Leonard, M. Manning, W. Hagenbuck, R. Krapf, C. Noble, J. Staats, and R. Leinard. 1999. *Riparian Area Management A*

User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas (TR 1737-16). Prepared for the United States Department of Agriculture. BLM, National Applied Resource Sciences Center. Denver, CO.

¹⁷Prichard, D., 1998. Riparian Area Management, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas (TR 1737-15). Prepared for the United States Department of the Interior and the United States Department of Agriculture. BLM, National Applied Resource Sciences Center. Denver, CO.



Figure 7: Map of Greater sage grouse habitat management areas in the Miles City Field Office

BLM Sensitive Plant Species

BLM Sensitive Species are defined by the BLM 6840 Manual as native species found on BLMadministered lands for which the BLM has the capability to significantly affect the conservation status of the species through management, and either: (1) there is information that a species has recently undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range, or; (2) the species depends on ecological refugia or specialized or unique habitats on BLMadministered lands, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk. Sensitive denotes species listed as Sensitive on BLM lands.

There are two sensitive status plant species within the MCFO boundary, Nuttall's Desertparsley (*Lomatium nuttallii*) and Visher's buckwheat (*Eriogonum visheri*) (MCFO ARMP, September 2015). Visher's buckwheat is a regional endemic species known in Montana since 1997 from only one area in Carter County. This population grows on sparsely vegetated alluvial outwash in badlands topography and as such does not appear to be threatened by weeds, livestock, or other activities at this time. The few populations of Nuttall's desert-parsley in the upper Tongue River drainage of Montana are disjunct from the main range of the species in southeastern Wyoming and adjacent Nebraska and Colorado. Its position on mid and lower slopes along drainages in conjunction with its occurrence on private land may make it susceptible to negative impacts from development activities. (MCFO ARMP, September 2015). None of the 289 AIM or LMF plots analyzed between 2017 – 2020 had either species present.

Limiting Factors for Wildlife

Although there are some limiting factors (factors that limit species distribution and abundance) specific to individual wildlife species, there are a variety of shared factors among most species. The principal factors that limit or affect wildlife in the assessment area include weather (severe winter or summer drought); disturbance from human activities; and habitat fragmentation, degradation, and loss.

2.6.3 Analysis and Findings

As indicated in the Upland Standard addressed above, a variety of data was utilized to determine habitat condition throughout the analysis area. Vegetative cover, bare ground, species diversity, and litter cover for the subject allotments were attributes considered in the analysis of habitat condition and availability. Invasive species which can have detrimental impacts on wildlife habitats, are defined as a species that are non-native to the ecosystem under consideration and whose introduction causes or is likely to cause environmental harm. Spotted knapweed, Canada thistle, Salt Cedar, and ventenata occur in relatively small infestations or as scattered plants through the project area.

A wide variety of native grass and forb species are needed to provide forage and cover for

numerous wildlife species and annual grass and forb recruitment is a concern. The data reflects early spring moisture has increased annual grass/forb recruitment. This exemplifies that annual plants such as Japanese brome and yellow sweet clover (determined an annual by the RAP) became a naturalized component of the environment and will never be eradicated from the mixed grass community. Japanese brome has poor forage value, is highly competitive, and can displace native species. The right weather conditions and the lack of large, perennial bunchgrasses has promoted the presence of Japanese brome. Japanese brome is aggressive and competitive, with seedlings of perennial plants. Nonnative annual grasses can severely decrease the biological diversity of native agronomic habitats by reducing the availability of desirable forage for livestock, degrading wildlife habitats, and hindering recovery from fire.

The sage-grouse habitat objectives in Table 14 summarize the characteristics that research has found represent the seasonal habitat needs for GRSG (Table 2-6, MCFO ARMP, September 2015). The desired conditions of the GRSG Habitat Objectives in the MCFO Approved RMP are tied to the potential of the ecological sites that exist in a project area. The MCFO Land Use Plan effectiveness monitoring plan groups similar ecological sites (Grouped ESDs), that have the potential to produce similar plant comunities. As identified in the Plan the MCFO Grouped ESDs are: Clay-based, Sand/Gravel, Saline, Shallow and Silty/Loamy. The Silty/Loamy group is the most common in the project area and covers about 35% of BLM surface acres of the area. The next most common Grouped ESDs are Clay-based (29%), Sand/Gravel (8%), Shallow (13%) and Saline (3%).

Between 2017 and 2020, 289 guantitative AIM/LMF plots were analyzed across the Miles City Field Office. One hundred twenty-seven (127) of these plots fell within project allotments. These plots were assessed against their respective Ecological Site Description (ESD). An ESD uses biotic and abiotic factors to describe the range of possible plant communities that could occur on a site and provides a standard reference for land manager decisions. For the project, existing plant community characteristics collected for each plot were evaluated against the ESD reference plant community for the keyed ecological site, at each field location. This information was factored into rangeland health determinations, including the Habitat Standard. Using the ESD Reference Worksheet plus additional cover estimates from the ESD Cover and Structure table, plots were identified as within reference conditions or not. If a plot was found not to be within reference for any given attribute, professional knowledge coupled with historical data and photographs were used to evaluate whether the plot indicated resource concerns or were within natural site variability. See Appendix D for summary plot summary data presented Grouped ESD within Management Zone. Twelve Management Zones in the project area had areas identified as GRSG priority habitat and there were 42 AIM/LMF plots evaluated within project allotments. There were 17 Clay-based Grouped plots, 13 Silty/Loamy Grouped, 7 Saline Grouped, 3 Sand/Gravel Grouped, and 1 Overflow plot.

All plots within PHMA were found to be within reference for ESD cover attributes of grass/sedge, forb, shrub, litter, and bare ground, or were within the range of variability for respective ESDs. Perennial grass/sedge canopy cover for breeding, nesting, and brood-rearing time periods has an objective of greater than 10% (ARMP, Sept. 2015). Perennial grass and forb canopy cover estimates exceeded GRSG Habitat objectives on all plots within project allotments or were within the range of variability for respective ESDs for plots

distributed across the PHMA. Preferred forb species were common throughout the PHMA with 88 different species Table (Appendix E).

Nearly all plots had preferred forbs as the most common forb species, by percent foliar cover (Appendix E). The MCFO Grouped ecological sites had an abundance of preferred for species for sage-grouse, with the highest number of preferred forbs with 26 and 24 unique species were the Silty/Loamy and Clay-based Grouped ESDs, respectively. While the Saline and Overflow had 16 and 14 unique species inventoried. Regardless of ESD, the most commonly found preferred forb species for the assessment area were scarlet globemallow found on 16 of the 18 plots while salsify was found on 13. Common dandelion, wild onion, Hood's phlox, western yarrow, Indian breadroot, stiffstem flax and white prairie aster were each identified on about a third of all plots.

As identified in the ecological site description Cover and Structure table for each ESD, cover for all forbs ranged from a trace to 5% on Saline sites, to a high of 5-10% on Clayey sites. Though, a site may have had less than 3% preferred perennial forb cover, the sampled plant community was still within the ecological site potential. There were 4 plots where perennial preferred forb cover was not measured on the transect, however preferred species were found on the plot during the species inventory. Three of these plots were sampled in the severe drought year of 2017 and 1 plot in 2018. The plots sampled in 2017 had 2 - 4perennial preferred forbs inventoried and the 2018 plot had 1 perennial preferred forb identified. Additionally, many of the project plots sampled had annual preferred forb species present, but they were not considered in this evaluation.

Perennial grass/sedge and forb heights was within or exceeded the GRSG Habitat objective of 4.4 – 11.3 inches (MCFO ARMP, September 2015) on all project allotment plots within the PHMA. Grass heights range, regardless of ecological site, was 6-21 inches in 2017, 8 to 15 inches in 2018, 12 to 19 inches in 2019 and 13 to 16 inches in for 2020. For 2017 and 2018, 50% and 75% of plots, respectively, had grass heights of 11 inches or greater, while all plots in 2019 and 2020 had grass heights of 12 inches and greater. Forb heights for all years ranged from a low of 4 inches in 2017 on a Saline upland site to a high of 28 inches on a 2019 Overflow site. And for all year, 68% of all plots had forb heights of 11 inches and greater.

The GRSG Habitat objective for sagebrush canopy cover is 5-25%, relative to ecological site potential. Overall shrub component potential on many of the ecological sites within the project area is often described as occurring in small percentages. The saline ecological sites are described as having some of the higher percentages of shrub species composition by weight, however the salt tolerant shrubs saltbush and greasewood are more common. Within the overall shrub component where Wyoming big sagebrush is listed as one of the Historic Climax/Potential Plant community major shrub species it often has the range of 0-5%, 1-5% or 1-10% species composition by weight. All plots were determined to be within reference for overall shrub cover and within natural variation for Wyoming big sagebrush cover.

Five project plots within PHMA, did not have Wyoming big sagebrush recorded as present. Silver sagebrush was present in 3 of these plots, and Gardner's saltbush was present on 1 plot. The fifth plot was located on a silty site in a prairie dogtown and no shrubs were inventoried on the plot. A dense clay site in Cottonwood Creek Management zone had overall low shrub cover with Wyoming big sagebrush at 1% cover, however the site may have been higher in salts as Gardner's saltbush and greasewood had cover estimates of 2% and 1% respectively.

Distribution of ecological sites across the Miles City Field Office area is a mosaic and though a plot is assigned a specific ecological site, the plant community on the plot may not expected to fully align with that ecological site description. For example, Wyoming big sagebrush is not identified as a major species for Saline sites, though it was present on all plots sampled, ranging from present in the species richness survey to 21% foliar cover on a plot in the Cottonwood Creek management zone.

For all other plots (n=33) Wyoming big sagebrush cover ranged from 3% on 4 plots to 30% on a single plot. Eighty-five percent (85%) of all plots had cover estimates of 5% or greater. The remaining 15% of plots (n=5) had cover estimates between 3 and 4% and were within expected range of variability for Wyoming big sagebrush potential for the respective ecological site.

The GRSG Habitat objective for sagebrush height is 6-31 inches. Sagebrush height for plots in project allotments were within the Habitat Objective or were within the expected range of variability for the evaluated ecological site. Wyoming big sagebrush heights ranged from 3 to 19 inches. Two Saline plots had average heights of 3 and 5 inches. Wyoming big sagebrush height generally ranges from 3.9 to over 39 inches (NatureServe), shorter than average heights could be expected for areas with higher saline/sodic soils. All other plot heights averaged 6 inches or greater. An average height of 10 inches or greater was found on 67% of the plots, while for 33% plots, average height ranged between 6 inches and 9 inches.

Allotment Conclusion (Overall Habitat Ratings)

The Habitat Standard in the assessment area is met, as existing monitoring data indicates vegetative species diversity, abundance/cover is adequate to provide for a wide variety of wildlife species, including BLM Special Status Species. Refer to Standard #1 (Uplands) for specifics on vegetative species diversity, cover and other attributes based on ecological site descriptions. Assessment area-wide biodiversity concerns include invasive species, loss/fragmentation of sagebrush habitats, browsing of shrub and tree species including chokecherry, green ash, silver buffloberry, and other vegetive species.

2.6.4 Recommendations for Habitat

- Continue to maintain or improve wildlife habitat conditions on all 1,372 grazing allotments. Where assessments indicate high quality rangeland, continue to implement designed management systems if other standards are being achieved or there is no need by the permittee/lessee to modify the management.
- Implement fuels and vegetation management treatments targeting emphasis areas. Treatments should be coordinated with adjacent landowners to maximize efficiency and landscape benefits. Management treatments in moderate to high departure areas would likely shift the declining vegetation trend to an upward trend/improved

vegetation condition. Regardless of vegetation condition, prescribed fire would likely be excluded from landscapes with ecological sites capable of supporting sagegrouse habitat and mechanical treatments would be assessed on a case-by-case basis.

- 3. Consider taking advantage of natural disturbances, such as wildfires, to promote native species establishment and shrub diversity including:
 - a. Spraying and/or other method of converting areas from crested wheatgrass or other nonnative/invasive vegetation to native vegetation.
 - b. Native plantings, including sagebrush, in disturbed areas.
- 4. Consider the use of commercial and non-commercial/mechanical treatments, and/or prescribed fire to improve:
 - a. Forest health conditions based on historic composition, structure, and density.
 - b. Reduce conifer encroachment in sagebrush and grassland habitats.
 - c. Promote forest stand age diversity by increasing acres in early and late seral stages.
 - d. To promote understory species diversity and increase deciduous shrubs.
- 5. Implement treatments for noxious weed control—both internally and with permittees—to treat inaccessible areas, project work or disturbance areas, containment of large infestation areas, eradication of small/minor infestations, hard to manage species like salt cedar and Russianolive, and new invaders such as yellow starthistle and ventenata. Control efforts will focus on the Montana State Noxious Weed list, county noxious weed lists, neighboring states' noxious weed lists, and the BLM invasive species list.
- 6. Construct, modify, or remove range improvements projects as needed to improve management, habitat, and/or wildlife movements. Existing and proposed projects need to incorporate wildlife friendly design to reduce incidental mortality and improve wildlife movements. These projects could include:
 - a. Livestock water (pipelines and tanks, springs, water savers, or reservoirs)
 - b. Fences
 - c. Exclosures
- 7. Improve and/or increase riparian and mesic habitat through a variety of methods including: encouraging willow growth and reestablishment where feasible, stabilizing head cuts, hardening streambanks and crossings as appropriate, and supporting beaver establishment and expansion starting in the upper portions of drainages and adjacent to existing populations, as appropriate.
- 8. Maintain or improve sage-grouse habitat, with an emphasis on priority habitat in areas with reduced threats (away from roads, overhead power lines, and agriculture).
- 9. Facilitate wildlife movement which includes modification or removal of fences or other structures. Leave gates open when not needed for grazing management, removing infrastructure no longer necessary or replacing infrastructure with more wildlife friendly options.

- 10. Consider changes in grazing management to allow for herbaceous regrowth in the same growing season.
- 11. Consider changes in grazing to use areas with extensive yellow sweetclover or annual brome cover.

2.7 Conclusion and Next Steps

Based on the multiple lines of evidence and information analyzed in the formation of this report, the Standards for Rangeland Health for Miles City were met on all allotments listed in Appendix A. If future evaluations conclude that one or more Standards are not being met, and significant progress is not being made, a Determination of Causal Factors will be completed. Current livestock grazing management and other uses will be evaluated to identify causes of any unsatisfactory conditions. Significant causal factors can include, but are not limited to: livestock grazing management, invasive species, non-native vegetation, wildfire, off-highway vehicles (OHV), wildlife concentration, roads, and trails, or a combination of factors.

This document does not constitute a decision but provides the basis for the Miles City Field Office Manager to make their determination on whether or not existing grazing management practices or levels of grazing use on public lands are significant factors in failing to achieve the standards and conform to the guidelines for livestock grazing management. The field managers will finalize the determination document just prior to issuing the proposed grazing decision on the associated allotment.

Chapter 3: Additional Information

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Glossary of Terms

Animal Unit: A 1,000-pound cow, with or without an unweaned calf, with such a cow consuming 26 pounds of forage dry matter per day.

Animal Unit Month: The amount of forage needed by an "animal unit" (AU) grazing for one month.

Anthropogenic: Caused or influenced by humans.

Assessment: The estimation or judgement of the status of ecosystem structures, functions, or processes, within a specified geographic area (preferably a watershed or a group of contiguous watersheds) at a specific time. An assessment is conducted by gathering, synthesizing, and interpreting information, from observations or data from inventories and monitoring. An assessment characterizes the status of resource conditions so that the status can be evaluated (see definition of evaluation) relative to land health standards. An assessment sets the stage for an evaluation. An assessment is not a decision.

Benchmark: Baseline resource information provided in the Ecological Site Description.

Desired Condition: A desired condition is a description of specific social, economic, and/or ecological characteristics of the plan area, or a portion of the plan area, toward which management of the land and resources should be directed. Desired conditions must be described in terms that are specific enough to allow progress toward their achievement to be determined, but do not include completion dates (36 CFR 219.7(e)(1)(i)).

Determination: Document recording the authorized officer's finding that existing grazing management practices or levels of grazing use on public lands grazing either are or are not significant factors in failing to achieve the standards and conform with the guidelines within a specified geographic area (preferably watershed or a group of contiguous watersheds).

Ecological Sites: A distinctive kind of land with specific characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation. (USDA Definition).

Ecological Thresholds: The point at which there is an abrupt change in an ecosystem quality, property or phenomenon, or where small changes in an environmental driver produce large responses in the ecosystem.

Evaluation: An evaluation is conducted to arrive at 2 outcomes. Firstly, an evaluation conducts an analysis and interpretation of the findings resulting from the assessment, relative to land health standards, to evaluate the degree of achievement of land health standards. Secondly, an evaluation conducts an analysis and interpretation of information--be it observations or data from inventories and monitoring--on the causal factors for not achieving a land health standard. An evaluation of the causal factors provides the foundation for a determination (see definition for determination).

An evaluation goes further than an assessment because an evaluation takes what the assessment provides—which is the status of resource conditions characterized by the appropriate indicators—and evaluates them according to land health standards. Then, this leads to a prognosis of: land health standard achieved; making significant progress toward achieving a land health standard; or land health standard not achieved. If the land health standard is not achieved, the evaluation of the causal factors allows a determination to be made. In summary, an evaluation builds on the assessment, and the evaluation sets the stage for a determination.

Forest land: Land that is now, or has the potential of being, at least 10% stocked by forest trees (based on crown closures) or 16.7% stocked (based on tree stocking).

Functioning at risk (FAR): (1) Condition in which vegetation and soil are susceptible to losing their ability

to sustain naturally functioning biotic communities. Human activities, past or present, may increase the risks. Rangeland Reform Final Environmental Impact Statement (FEIS) at 26. (2) Uplands or riparianwetland areas that are properly functioning, but a soil, water, or vegetation attribute makes them susceptible to degradation and lessens their ability to sustain natural biotic communities. Uplands are particularly at risk if their soils are susceptible to degradation. Human activities, past or present, may increase the risks

Fundamentals of Rangeland Health: Overarching principles of rangeland health, listed at 43 CFR § 4180.1, which establish the Department's policy of managing for healthy rangelands (60 Federal Register (FR) at 9954). State or regional standards and guidelines must provide for conformance with the Fundamentals of Rangeland Health (43 CFR § 4180.2(b)).

General Habitat Management Area (GHMA): BLM lands within the Miles City Field Office within sagegrouse general habitat that have specific management direction associated with the Miles City Field Office Greater Sage-Grouse Approved Resource Management Plan Amendment (2015).

Guideline: A practice, method or technique determined to be appropriate to ensure that standards can be met or that significant progress can be made toward meeting the standard. Guidelines are tools such as grazing systems, vegetative treatments, or improvement projects that help managers and permittees achieve standards. Guidelines may be adapted or modified when monitoring or other information indicates the guideline is not effective, or a better means of achieving the applicable standard becomes appropriate.

Hydrologic Unit: The USGS has developed a system of geographic units based upon watersheds. These units were originally subdivided to four levels. Subsequently, two additional subdivisions have been developed. Currently there are six levels, and the sixth is the smallest unit.

Indicators: Components of a system whose characteristics (presence or absence, quantity, distribution) are used as an index of an attribute (e.g., rangeland health attribute) that are too difficult, inconvenient, or expensive to measure (Interagency Technical Reference 1734-8, 2000).

Land Health: Degree to which the integrity of the soil and the ecological processes of ecosystems are sustained.

Lentic: Standing or still water such as lakes and ponds.

Lotic: Flowing or actively moving water such as rivers and streams.

Nonfunctioning Condition: (1) Condition in which vegetation and ground cover are not maintaining soil conditions that can sustain natural biotic communities. (2) Riparian-wetland areas are considered to be in nonfunctioning condition when they don't provide adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows and thus are not reducing erosion, improving water quality, or other normal characteristics of riparian areas. The absence of a floodplain may be an indicator of nonfunctioning condition.

Nonpoint source pollution: Pollution originating from diffuse sources (land surface or atmosphere) having no well-defined source.

Objective: A description of a desired future resource condition to be achieved in a specified time frame to meet land use plan goals.

Priority Habitat Management Area (PHMA): BLM lands within the Miles City Field Office within sagegrouse priority habitat that have specific management direction associated with the Miles City Field Office Greater Sage-Grouse Approved Resource Management Plan Amendment (2015). Priority habitat generally coincides with 75% of the sage-grouse population.

Priority Vegetation: Priority Vegetation is the strategic grouping of ecological systems that are important for species and habitats the BLM LFO manages. This was done to prioritize and focus future

management strategies based on a comprehensive understanding of species and habitat and vegetation community relationships. Priority vegetation types provide habitat for assemblages of native wildlife, including BLM sensitive species, game species and migratory birds.

Potential: The highest ecological status a site can attain given no social or economic constraints.

Proper Functioning Condition (PFC): (1) An element of the Fundamental of Rangeland Health for watersheds, and therefore a required element of State or regional standards and guidelines under 43CFR § 4180.2(b). (2) Condition in which vegetation and ground cover maintain soil conditions that can sustain natural biotic communities. For riparian areas, the process of determining function is described in the BLM Technical Reference TR 1737-9. (3) Riparian/wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid floodplain development; improve floodwater retention and groundwater recharge; develop root masses that stabilize stream banks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity. The functioning condition of riparian-wetland areas is influenced by geomorphic features, soil, water, and vegetation. (4) Uplands function properly when the existing vegetation and ground cover maintain soil conditions capable of sustaining natural biotic communities. The functioning condition of uplands is influenced by geomorphic features, soil, water, and vegetation.

Rangeland Health: The degree to which the integrity of the soil and ecological processes of rangeland ecosystems are sustained. Rangeland health exists when ecological processes are functioning properly to maintain the structure, organization and activity of the system over time.

Reference Condition: In the context of an ecological site, reference condition is the condition which meets, or comes close to meeting, all relevant land health standards. In addition, the reference condition provides a set of indicators (and their appropriate range of values) to be used for the assessment of an equivalent ecological site (which will not necessarily be in reference condition). Reference conditions are provided in published Ecological Site Descriptions or in the records of Ecological Site Inventories and Soil Surveys.

In a more general multi-scale context, a reference condition will reflect and lie within the historic range of variability for environmental conditions, processes and functions, generally considered to have operated during the 1,000 year period immediately preceding EuroAmerican settlement. These environmental conditions, processes, and functions can be operative at different scales, from the finescale (e.g. organic matter content at the site specific scale) to the large-scale (e.g. plant community composition at the watershed or subbasin scale).

Riparian Zone: The banks and adjacent areas of water bodies, water courses, seeps, and springs, whose waters provide soil moisture sufficiently in excess of that otherwise available locally, providing a moister habitat than that of contiguous flood plains and uplands.

Significant Progress: Movement toward meeting standards and conforming to guidelines that is acceptable in terms of rate and magnitude. Acceptable levels of rate and magnitude must be realistic in terms of the capability of the resource, but must also be as expeditious and effective as practical.

Significant Factor: Principal causal factor in the failure to achieve the land health standard(s) and conform with the guidelines. A significant factor would typically be a use that, if modified, would enable an area to achieve or make significant progress toward achieving the land health standard(s). To be a

significant factor, a use may be one of several causal factors contributing to less-than-healthy conditions; it need not be the sole causal factor inhibiting progress towards the standards.

Total Maximum Daily Load (TMDL): The goal of the Clean Water Act (CWA) is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Under section 303(d) of the CWA, states are required to develop lists of impaired waters. The law requires that states establish priority rankings for waters on the lists and develop TMDLs for these waters. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still safely meet water quality standards.

TMDL Planning Areas: Montana DEQ is using a watershed approach to address TMDLs based on the premise that water quality restoration and protection are best addressed through integrated efforts within a defined geographic area. DEQ has divided the state into 91 watershed planning areas to facilitate development of TMDL/water quality restoration plans.

Wilderness Characteristics: These attributes include the area's size, its apparent naturalness, and outstanding opportunities for solitude or a primitive and unconfined type of recreation. They may also include supplemental values.

Woodland: Forest communities occupied primarily by non-commercial species such as juniper, mountain mahogany, or quaking aspen groves. All western juniper forest lands are classified as woodlands, since juniper is classified as a non-commercial species. Woodland tree and shrub canopy cover varies, but generally individual plant crowns do not overlap.

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Appendices Appendix A: Grazing Allotments

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
00002	CLARK L & L	CUSTODIAL	24	542	-	1	HORSE	03/01	02/28	100	6
00004	BAILEY	CUSTODIAL	160	4,172	-	2	CATTLE	03/01	02/28	100	24
00005	BAKER, C. W.	CUSTODIAL	185	3,082	-	3	CATTLE	03/01	02/28	100	20
00006	DRAPER	CUSTODIAL	120	2,400	-	3	CATTLE	03/01	02/28	100	36
00007	J. BAKER INDIVIDUAL	CUSTODIAL	40	880	-	1	CATTLE	03/01	02/28	100	8
00008	HANKS ALLOTMENT	CUSTODIAL	190	868	-	3	CATTLE	03/01	02/28	100	36
00009	MISSION	CUSTODIAL	80	50	-	1	HORSE	03/01	02/28	100	12
00010	BALDER	CUSTODIAL	53	714	-	3	CATTLE	03/01	02/28	100	34
00011	BARCLAY	MAINTAIN	2,239	1,597	320	1	CATTLE	03/01	02/28	100	6
00012	BATES	MAINTAIN	447	640	-	1	HORSE	03/01	02/28	100	15
00013	BEECHER ALLOTMENT	CUSTODIAL	2,920	27,252	1,920	54	CATTLE	03/01	02/28	100	643
00014	BOBCAT CREEK	IMPROVE	2,061	4,839	-	2	CATTLE	03/01	02/28	100	24
00015	BENNETT	MAINTAIN	190	800	-	84	CATTLE	05/01	09/14	25	95
00016	BENTLEY	CUSTODIAL	160	3,513	-	7	CATTLE	03/01	02/28	100	39
00017	BERGER	CUSTODIAL	520	4,788	-	11	CATTLE	03/01	02/28	100	136
00019	BOELK COULEE	MAINTAIN	1,726	2,142	-	2	CATTLE	03/01	02/28	100	24
00020	BILLING ALLOTMENT	MAINTAIN	2,963	2,708	-	18	SHEEP	03/01	02/28	100	43
00021	MAHONEY UNIT	MAINTAIN	1,207	2,240	-	143	CATTLE	06/01	12/01	32	277
00022	MBT ALLOTMENT	CUSTODIAL	278	2,476	-	10	CATTLE	06/01	11/30	100	59
00023	CURRAN	CUSTODIAL	40	2,296	-	1	CATTLE	03/01	02/28	100	8
00024	BINION ALLOTMENT	MAINTAIN	16,954	83,538	-	1	CATTLE	03/01	02/28	100	15
00028	BLISS ALLOTMENT	MAINTAIN	658	7,518	320	14	CATTLE	03/01	02/28	100	163

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
00030	SPRING CR.	MAINTAIN	1,479	4,124	-	220	CATTLE	05/15	08/04	22	130
00032	PINKERTON ALLOTMENT	MAINTAIN	9,354	6,066	1,005	2	CATTLE	03/01	02/28	100	31
00033	MOSBY	CUSTODIAL	4,398	1,280	-	5	CATTLE	03/01	02/28	100	58
00034	UNALLOCATED-G5RIMSRUD T23N,R41E. S. 1	CUSTODIAL	827	8,991	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
00035	71 RANCH CO.	MAINTAIN	1,600	7,712	-	17	CATTLE	03/01	02/28	100	211
00036	FRIEZ	MAINTAIN	1,280	9,470	631	16	CATTLE	03/01	02/28	100	190
00037	MARTENS	CUSTODIAL	120	1,160	-	2	CATTLE	03/01	02/28	100	24
00038	ARROW CATTLE	CUSTODIAL	322	3,979	-	10	CATTLE	03/01	05/01	100	20
00039	SHADE CREEK	MAINTAIN	197	2,214	-	7	CATTLE	04/01	11/30	100	60
00041	CARTWRIGHT UNIT	CUSTODIAL	480	2,229	-	8	CATTLE	03/01	02/28	100	93
00042	COSTON	CUSTODIAL	156	1,383	-	5	CATTLE	03/01	02/28	100	47
00043	HAMILTON	CUSTODIAL	160	6,642	319	2	CATTLE	03/01	02/28	100	24
00044	BRUSETT ALLOTMENT	CUSTODIAL	200	8,176	-	3	CATTLE	04/01	11/15	100	23
00046	H BRUSETT ALLOTMENT	MAINTAIN	715	1,960	-	11	CATTLE	03/01	02/28	100	124
00047	BUFFINGTON AMP	MAINTAIN	3,829	1,386	-	25	CATTLE	06/02	11/04	100	128
00048	BURGESS RANCH AMP	MAINTAIN	21,620	13,190	2,520	4	CATTLE	05/01	06/15	65	4
00050	BUSSE	CUSTODIAL	40	1,514	-	1	CATTLE	03/01	02/28	100	12
00051	BYXBE	CUSTODIAL	120	634	-	3	CATTLE	03/01	02/28	100	36
00054	LEWIS	CUSTODIAL	80	2,794	640	2	CATTLE	03/01	02/28	100	18
00055	PRAIRIE ELK	CUSTODIAL	584	8,351	1,280	10	CATTLE	03/01	02/28	100	128
00056	CARLSON	CUSTODIAL	140	2,200	-	2	CATTLE	03/01	02/28	100	28
00058	QUIETUS	CUSTODIAL	280	3,960	640	6	CATTLE	03/01	02/28	100	60
00059	MACDONALD	CUSTODIAL	120	1,796	-	2	CATTLE	03/01	02/28	100	28
00060	MAGELSSEN	CUSTODIAL	120	3,384	-	1	CATTLE	03/01	02/28	100	18
00061	CHILDERS ALLOTMENT	MAINTAIN	1,312	3,080	745	2	CATTLE	03/01	02/28	100	21
00064	BLUHM PLACE	MAINTAIN	1,085	3,251	-	1	CATTLE	03/01	02/28	100	4
00065	GILBERT CR. COMMON	IMPROVE	8,526	3,512	456	33	CATTLE	03/01	02/20	93	360

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
00066	POINT PASTURE A	IMPROVE	3,348	3,624	500	55	CATTLE	03/01	02/28	100	656
00067	COLDWELL HOME B	IMPROVE	5,672	12,762	660	2	CATTLE	05/15	12/16	67	10
00068	COLLINS ALLOTMENT	MAINTAIN	1,842	4,731	-	4	CATTLE	03/01	02/28	100	48
00069	ART MACKAY	MAINTAIN	160	40	640	37	CATTLE	05/16	06/15	100	38
00070	COLLINS ALLOTMENT #1	MAINTAIN	9,825	3,258	480	1	CATTLE	05/01	06/30	89	2
00071	COOLEY ALLOTMENT	IMPROVE	2,248	4,274	640	10	CATTLE	03/01	02/28	100	120
00073	WESCO	CUSTODIAL	80	7,659	-	1	CATTLE	03/01	02/28	100	12
00075	СОХ	CUSTODIAL	547	3,642	-	8	CATTLE	03/01	02/28	100	93
00076	CROCKER	CUSTODIAL	46	1,311	-	1	CATTLE	05/01	11/30	100	7
00078	BERGLEE	CUSTODIAL	200	2,157	-	4	CATTLE	03/01	02/28	100	43
00079	CUSKER	CUSTODIAL	605	4,540	-	9	CATTLE	03/01	02/28	100	114
00080	DANN	MAINTAIN	2,296	1,923	-	6	CATTLE	03/01	02/28	100	71
00081	RALSTON ALLOTMENT	CUSTODIAL	1,831	701	-	80	CATTLE	05/01	11/02	53	259
00085	RANCHOLME	IMPROVE	3,989	11,777	1,330	1	CATTLE	05/15	10/15	46	2
00086	MITCHELL	CUSTODIAL	440	9,621	640	10	CATTLE	03/01	02/28	100	103
00087	DREW PLACE	CUSTODIAL	962	6,115	-	9	CATTLE	03/01	02/28	100	108
00088	TEW	MAINTAIN	1,844	2,491	1,120	167	CATTLE	04/01	11/29	30	400
00090	STATE SECTION PAST.	MAINTAIN	117	-	640	3	CATTLE	06/01	10/20	100	14
00091	DUTTON INDIVIDUAL	CUSTODIAL	320	7,134	640	3	CATTLE	03/01	02/28	100	32
00092	SHY	CUSTODIAL	626	1,575	-	44	CATTLE	05/01	11/01	39	104
00093	LOOMIS	IMPROVE	6,574	5,948	1,280	452	CATTLE	05/11	01/06	44	1576
00094	EDWARDS	MAINTAIN	2,115	13,339	-	13	CATTLE	03/01	02/28	100	155
00095	KINGS 1 AND 2	CUSTODIAL	528	1,005	-	54	CATTLE	05/01	10/31	26	85
00096	STEVENS	CUSTODIAL	80	6,320	-	1	CATTLE	03/01	02/28	100	11
00097	EDWARDS ALLOTMENT	MAINTAIN	807	1,839	-	2	CATTLE	03/01	02/28	100	18
00103	POP'S PLACE	CUSTODIAL	40	396	-	1	CATTLE	03/01	11/30	100	9
00104	ERICKSON, GRANT	MAINTAIN	1,240	16,406	-	30	CATTLE	05/01	10/30	100	180
00106	HAROLD	CUSTODIAL	189	3,213	-	5	CATTLE	03/01	02/28	100	64

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
00107	THEBES COMMON PAST.	CUSTODIAL	320	9,627	-	2	CATTLE	03/01	02/28	100	25
00108	NORTH WHITESIDE	MAINTAIN	1,574	3,560	640	17	CATTLE	03/01	02/28	100	203
00109	FERCH	MAINTAIN	603	3,353	-	11	CATTLE	03/01	02/28	100	133
00110	YOUNG	CUSTODIAL	80	2,815	184	2	CATTLE	03/01	02/28	100	21
00111	FERGUSON ALLOTMENT	MAINTAIN	3,143	1,982	417	1	CATTLE	05/01	05/30	64	1
00114	FISKE	CUSTODIAL	200	2,549	-	5	CATTLE	03/01	02/28	100	30
00115	FITCH	CUSTODIAL	40	1,824	3	1	CATTLE	03/01	02/28	100	11
00116	FLATEN	MAINTAIN	315	5,876	-	4	CATTLE	03/01	02/28	100	52
00119	HELLYER	MAINTAIN	1,120	2,663	320	21	CATTLE	03/01	02/28	100	251
00121	FRADY	CUSTODIAL	961	6,007	-	1	CATTLE	03/01	02/28	100	9
00123	GALT	MAINTAIN	17,745	68,396	11,200	209	CATTLE	03/01	02/28	100	2501
00125	THORGAARD AMP	MAINTAIN	2,350	4,170	963	2	CATTLE	09/24	11/30	46	2
00126	GASS	MAINTAIN	1,200	4,221	320	22	CATTLE	03/01	02/28	100	267
00130	D. GIBBS ALLOTMENT	MAINTAIN	3,000	8,748	1,120	1	CATTLE	03/01	02/28	100	14
00132	TOWE UNIT	MAINTAIN	4,030	11,491	640	1	CATTLE	05/15	06/15	100	1
00133	SHEFELBINE	CUSTODIAL	585	320	-	4	CATTLE	03/01	02/28	100	48
00134	COTTONWOOD CREEK	MAINTAIN	3,626	10,446	1,872	4	CATTLE	03/01	02/28	100	40
00135	GREBE	CUSTODIAL	640	19,079	640	9	CATTLE	03/01	02/28	100	108
00137	GRIBBLE ALLOTMENT	IMPROVE	193	125	-	28	CATTLE	06/01	09/01	71	61
00138	WEST FORK	MAINTAIN	240	640	-	45	CATTLE	05/01	10/04	25	58
00139	GRIBBLE ALLOTMENT	IMPROVE	1,208	1,320	-	101	CATTLE	05/01	10/24	41	241
00140	GUESANBURU UNIT	MAINTAIN	1,578	24,879	1,920	9	CATTLE	03/01	02/28	100	9
00141	ROMINE COULEE	MAINTAIN	5,704	2,578	320	1	CATTLE	03/01	02/28	100	9
00143	HAFLA	CUSTODIAL	143	2,637	-	4	CATTLE	03/01	02/28	100	51
00145	HANKS	CUSTODIAL	600	3,349	-	11	CATTLE	03/01	02/28	100	132
00146	DALE'S PLACE	CUSTODIAL	200	1,796	-	3	CATTLE	03/01	02/28	100	38
00147	FRANKLIN	CUSTODIAL	40	1,966	-	1	CATTLE	03/01	02/28	100	5
00148	HARBAUGH RANCH	IMPROVE	5,328	9,616	640	1	CATTLE	03/01	02/28	100	11

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
00149	HARBAUGH	MAINTAIN	1,098	6,209	480	1	CATTLE	03/01	02/28	100	12
00151	ALDERMAN	CUSTODIAL	640	6,238	-	20	CATTLE	03/01	02/28	100	214
00152	WEST ALLEN	CUSTODIAL	80	2,800	640	1	CATTLE	03/01	02/28	100	16
00154	COULTER B	MAINTAIN	1,315	3,016	640	20	CATTLE	03/01	02/28	100	244
00155	SHADE CREEK	IMPROVE	5,144	1,443	640	321	CATTLE	07/01	11/15	68	990
00157	HAYNIE	CUSTODIAL	120	1,880	-	5	CATTLE	03/01	02/28	100	36
00158	HAYS	MAINTAIN	10,349	9,518	760	478	CATTLE	03/01	02/28	35	2008
00159	HENSLEIGH ALLOTMENT	CUSTODIAL	642	1,273	640	4	CATTLE	03/01	02/28	100	53
00160	ARCHER	CUSTODIAL	230	6,177	640	6	CATTLE	03/01	02/28	100	68
00161	NICKWALL	CUSTODIAL	401	1,453	-	4	HORSE	03/01	02/28	100	49
00162	HESER IND	CUSTODIAL	160	320	-	3	CATTLE	05/01	10/30	100	19
00164	JACKS LEASE	MAINTAIN	681	21,793	1,280	17	CATTLE	03/01	02/28	100	198
00165	HINTZ	CUSTODIAL	400	760	-	18	HORSE	05/01	11/03	100	111
00167	HJELVIK	CUSTODIAL	320	5,339	616	3	CATTLE	03/01	02/28	100	41
00168	DOG CREEK AMP	MAINTAIN	19,524	38,606	3,840	1	CATTLE	04/01	07/31	27	1
00169	SAND CREEK AMP	MAINTAIN	11,771	33,195	2,800	23	CATTLE	03/01	02/28	100	271
00170	SO. FORK SUNDAY CR.	MAINTAIN	4,319	42,145	3,200	44	CATTLE	03/01	02/28	100	530
00171	BULL CREEK	MAINTAIN	10,520	50,757	3,202	128	CATTLE	03/01	02/28	100	1534
00174	HOVERSON ALLOTMENT	IMPROVE	2,799	4,631	-	16	CATTLE	03/01	02/28	100	192
00175	HOVLAND	CUSTODIAL	40	1,673	-	1	CATTLE	03/01	02/28	100	11
00176	HUBBARD	CUSTODIAL	294	2,537	320	6	CATTLE	03/01	02/28	100	67
00177	HUBING RANCH INC.	CUSTODIAL	40	8,600	1,280	2	CATTLE	03/01	02/28	100	11
00182	SHAVER	CUSTODIAL	249	6,046	640	7	CATTLE	03/01	02/28	100	42
00184	SPEAR J ALLOTMENT	MAINTAIN	1,691	3,246	21	12	CATTLE	03/01	02/28	100	138
00185	CROW ROCK	CUSTODIAL	79	955	-	2	CATTLE	03/01	02/28	100	27
00186	J.L. LAND	MAINTAIN	706	4,216	-	12	CATTLE	03/01	02/28	100	138
00187	LANGS FORK	MAINTAIN	1,758	1,480	640	6	CATTLE	03/01	02/28	100	70
00189	JARDEN RANCH	CUSTODIAL	80	5,895	960	4	CATTLE	03/01	02/28	100	23

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
00191	J. B. UNIT	CUSTODIAL	284	2,080	-	6	CATTLE	03/01	02/28	100	46
00192	MELVIN UNIT	CUSTODIAL	360	1,580	-	6	CATTLE	03/01	02/28	100	66
00193	WILBUR UNIT	CUSTODIAL	360	2,240	640	10	CATTLE	03/01	02/28	100	60
00194	JANSEN	CUSTODIAL	40	313	-	1	CATTLE	03/01	02/28	100	13
00195	SAUNDERS	MAINTAIN	960	4,160	-	14	CATTLE	03/01	02/28	100	169
00199	KILLEN	MAINTAIN	4,757	20,629	320	46	CATTLE	03/01	02/28	100	552
00200	BOYD UNIT	CUSTODIAL	320	7,114	320	5	CATTLE	03/01	02/28	100	63
00201	ROBERTS, D. AND P.	MAINTAIN	2,714	7,165	640	4	CATTLE	03/01	02/28	100	40
00202	COLLIER UNIT	MAINTAIN	800	3,179	1,280	6	HORSE	03/01	02/28	100	80
00203	WILKINSON	MAINTAIN	1,063	3,073	-	16	CATTLE	03/01	02/28	100	187
00204	KIRBY	MAINTAIN	4,108	5,067	1,040	1	CATTLE	03/01	12/31	100	10
00205	G AND D INC	CUSTODIAL	100	4,413	471	2	CATTLE	03/01	02/28	100	24
00206	BUSSE UNIT	CUSTODIAL	200	2,438	-	4	CATTLE	03/01	02/28	100	42
00207	KJELGAARD	MAINTAIN	1,961	1,928	-	1	CATTLE	05/01	06/01	100	1
00211	TED KOUNTZ LEASE	CUSTODIAL	560	1,160	-	42	CATTLE	04/01	12/05	47	162
00212	GLASSCOCK	MAINTAIN	1,915	7,039	640	28	CATTLE	03/01	02/28	100	332
00213	CHARANGUS	CUSTODIAL	528	23,325	1,280	10	CATTLE	03/01	02/28	100	118
00216	LACOSTA	IMPROVE	1,881	4,529	640	82	CATTLE	05/01	11/02	100	501
00217	MURNION ALLOTMENT	MAINTAIN	1,478	10,487	640	21	CATTLE	03/01	02/28	100	252
00219	CLINE	CUSTODIAL	160	2,000	-	3	CATTLE	03/01	02/28	100	42
00222	LEE INDIVIDUAL	MAINTAIN	1,230	10,809	640	23	CATTLE	04/01	11/24	100	180
00224	LEUENBERGER IND.	CUSTODIAL	40	550	-	1	CATTLE	03/01	02/28	100	9
00225	LEVALLEY	CUSTODIAL	320	5,589	640	9	CATTLE	03/01	02/28	100	89
00226	LIEN	CUSTODIAL	200	886	-	3	CATTLE	03/01	02/28	100	38
00227	HALVOR UNIT	CUSTODIAL	60	680	-	1	CATTLE	03/01	02/28	100	19
00228	LINFORD	MAINTAIN	971	10,098	640	23	CATTLE	03/01	02/28	100	276
00230	LONE PINE RANCH	MAINTAIN	594	6,979	320	16	CATTLE	03/01	02/28	100	174
00231	PIPAL	CUSTODIAL	80	320	-	3	CATTLE	03/01	02/28	100	18

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
00232	LONG	MAINTAIN	975	3,040	320	11	CATTLE	03/01	02/28	100	132
00234	LOOMIS COMMON	MAINTAIN	578	797	-	3	CATTLE	03/01	02/28	100	40
00235	INDIVIDUAL	MAINTAIN	280	640	-	2	CATTLE	03/01	02/28	100	28
00236	EDGAR UNIT	MAINTAIN	558	924	-	4	CATTLE	03/01	02/28	100	44
00237	LOSINSKI	CUSTODIAL	160	1,236	640	4	CATTLE	03/01	02/28	100	46
00239	MACDONALD	CUSTODIAL	600	10,853	320	56	SHEEP	03/01	02/28	100	136
00240	CURRY	CUSTODIAL	38	2,152	-	1	CATTLE	03/01	02/28	100	10
00242	MASON UNIT	MAINTAIN	904	4,856	-	18	CATTLE	03/01	02/23	100	213
00243	DALY	MAINTAIN	868	2,375	-	12	CATTLE	03/01	02/28	100	119
00245	MAVES	CUSTODIAL	80	1,741	-	2	CATTLE	03/01	02/28	100	22
00250	HAMMOND UNIT	MAINTAIN	2,144	1,120	-	128	CATTLE	05/15	10/15	75	486
00251	FLAT CREEK ALLOTMENT	MAINTAIN	925	3,442	-	3	CATTLE	03/01	02/28	100	37
00252	WATT ALLOTMENT	MAINTAIN	650	5,476	-	12	SHEEP	05/01	11/03	100	15
00257	MECKEL	CUSTODIAL	240	2,012	-	6	CATTLE	03/01	02/28	100	69
00258	MILLER UNITS A & B	MAINTAIN	1,183	1,080	-	1	CATTLE	03/01	02/28	100	6
00259	DRAINE	CUSTODIAL	137	2,541	-	3	CATTLE	03/01	02/28	100	34
00260	MILROY HOME UNIT	CUSTODIAL	160	7,562	320	3	CATTLE	03/01	02/28	100	32
00261	KENT UNIT	MAINTAIN	1,760	12,201	640	43	CATTLE	05/01	10/25	100	252
00262	EARLEY	CUSTODIAL	160	880	-	4	CATTLE	03/01	02/28	100	48
00264	EDWARDS	CUSTODIAL	756	5,957	183	8	CATTLE	03/01	02/28	100	95
00265	CLARKE UNIT	MAINTAIN	1,688	2,294	320	2	CATTLE	03/01	02/28	100	21
00266	COLEMAN UNIT	CUSTODIAL	80	17,902	920	5	CATTLE	03/01	02/28	100	25
00269	SONNY COULEE	MAINTAIN	5,634	9,977	40	54	INDIGENOUS	03/01	02/28	100	650
00270	PHILIP UNIT	CUSTODIAL	400	10,353	400	14	CATTLE	03/01	02/28	100	84
00271	MURPHY RANCH	CUSTODIAL	160	7,513	640	4	CATTLE	03/01	02/28	100	47
00272	CAP ROCK BUTTE	MAINTAIN	3,873	6,131	-	1	CATTLE	03/01	02/28	100	13
00273	MILAM	MAINTAIN	957	9,250	640	14	CATTLE	03/01	02/28	100	170
00274	EWALT	MAINTAIN	665	188	-	4	CATTLE	03/01	02/28	100	44

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
00275	NEFZGER	CUSTODIAL	546	3,820	-	9	CATTLE	03/01	02/28	100	104
00276	N & D COMMON ALLOT.	MAINTAIN	4,480	6,217	-	2	CATTLE	06/20	10/31	100	6
00278	SOUTH JORDAN	MAINTAIN	1,085	2,855	320	1	CATTLE	09/01	09/30	100	1
00279	ANTELOPE HILL AMP	MAINTAIN	2,845	1,520	320	8	CATTLE	11/02	02/28	100	31
00280	NNN RANCH	MAINTAIN	623	5,064	-	8	CATTLE	03/01	02/28	100	94
00281	N-N ALLOTMENT	CUSTODIAL	320	14,733	-	7	CATTLE	03/01	02/28	100	80
00283	NICKELS ALLOTMENT	IMPROVE	6,849	597	640	8	CATTLE	03/01	02/28	100	89
00285	SHELDEN	CUSTODIAL	140	1,247	-	2	CATTLE	03/01	02/28	100	29
00288	CLELL UNIT	CUSTODIAL	160	3,725	-	1	CATTLE	03/01	02/28	100	12
00293	OLSON, NORMAN	MAINTAIN	2,795	5,145	640	5	CATTLE	03/01	02/28	100	50
00294	PAINE AMP	MAINTAIN	7,329	6,305	1,274	30	CATTLE	03/01	02/28	100	363
00295	A HEART BAR	MAINTAIN	2,680	2,834	-	23	CATTLE	05/01	12/01	100	163
00296	PAWLOWSKI	MAINTAIN	2,689	1,924	-	188	CATTLE	05/01	11/28	44	577
00297	DEAD MAN COULEE	MAINTAIN	2,522	3,647	640	33	CATTLE	03/01	02/28	100	393
00301	CESSNA UNIT	CUSTODIAL	127	640	-	2	CATTLE	03/01	02/28	100	24
00303	GAY	MAINTAIN	10,723	40,703	3,545	50	CATTLE	03/01	02/28	100	603
00308	LEONARD & SONS	CUSTODIAL	160	3,337	-	5	CATTLE	05/01	12/31	100	40
00309	LANGS FORK 1	MAINTAIN	717	440	-	1	CATTLE	03/01	03/31	49	1
00311	FERRIN	CUSTODIAL	1,040	3,920	640	16	CATTLE	03/01	02/28	100	191
00313	REES	MAINTAIN	1,169	1,581	-	12	CATTLE	07/22	08/21	100	12
00315	ROBERTSON, KENNETH D	CUSTODIAL	120	7,880	-	3	CATTLE	03/01	02/28	100	33
00316	ROGGE	CUSTODIAL	200	2,197	-	8	CATTLE	05/01	10/31	100	48
00317	RONNING, WARREN	CUSTODIAL	80	1,765	-	3	CATTLE	03/01	02/28	100	18
00318	RORVIK PLACE	CUSTODIAL	452	1,440	-	7	CATTLE	03/01	02/28	100	81
00320	ROSS	MAINTAIN	8,391	18,127	1,920	23	CATTLE	03/01	02/14	66	175
00321	CURTISS AMP	MAINTAIN	1,239	1,698	-	1	HORSE	03/01	02/28	100	12
00323	LONE TREE CREEK	CUSTODIAL	26	1,270	320	1	CATTLE	03/01	02/28	100	7
00324	JEROME SAYLOR	CUSTODIAL	40	2,659	640	1	CATTLE	03/01	02/28	100	12

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
00325	SAYLOR	CUSTODIAL	320	2,756	-	95	CATTLE	03/01	02/28	100	91
00326	WALTER UNIT	CUSTODIAL	26	2,246	-	1	CATTLE	03/01	02/28	100	12
00327	SAYLOR ALLOTMENT	MAINTAIN	885	1,280	-	3	CATTLE	03/01	02/28	100	32
00328	SCHIFFER RANCH	MAINTAIN	1,901	10,350	640	30	CATTLE	04/01	12/03	100	244
00329	FLETCHER UNIT	MAINTAIN	4,772	199,927	1,920	1	CATTLE	03/01	02/28	100	16
00330	SCHILLREFF	CUSTODIAL	240	2,960	-	4	CATTLE	03/01	02/28	100	52
00331	ROUGH CREEK	CUSTODIAL	250	948	-	3	CATTLE	03/01	02/28	100	42
00332	RIDGE CHURCH	CUSTODIAL	46	1,652	-	3	CATTLE	03/01	02/28	100	15
00334	SCHMIDT	CUSTODIAL	396	1,292	-	35	CATTLE	05/01	11/01	54	115
00335	SCHUMACHER	CUSTODIAL	40	1,051	-	1	CATTLE	03/01	02/28	100	8
00337	SCHWEND	MAINTAIN	640	3,749	960	5	CATTLE	03/01	02/28	100	60
00338	V & B PLACE	MAINTAIN	640	6,997	640	14	CATTLE	03/01	02/28	100	171
00346	STEVES	CUSTODIAL	600	3,124	-	13	CATTLE	03/01	02/28	100	150
00348	SIEVERS	CUSTODIAL	320	1,022	-	5	CATTLE	08/01	12/31	100	29
00354	LEHNER UNIT	CUSTODIAL	80	1,120	-	1	CATTLE	03/01	02/28	100	13
00355	BURNER UNIT	CUSTODIAL	2,453	48,326	3,520	41	CATTLE	03/01	02/28	100	481
00356	SNELL	IMPROVE	1,040	8,313	640	6	CATTLE	03/01	02/28	100	77
00357	CHAPPEL PLACE	IMPROVE	3,600	2,829	320	359	CATTLE	05/15	10/15	49	891
00358	SORLEY	CUSTODIAL	320	838	640	6	CATTLE	03/01	02/28	100	67
00360	STAFFORD INDIVIDUAL	MAINTAIN	540	639	-	2	CATTLE	03/01	02/28	100	23
00361	JONES	CUSTODIAL	40	1,598	-	1	CATTLE	03/01	02/28	100	3
00363	JONES	MAINTAIN	2,433	3,891	566	40	CATTLE	03/01	02/28	100	485
00364	STANTON	CUSTODIAL	320	1,902	-	5	CATTLE	03/01	02/28	100	59
00365	STENSVAD	CUSTODIAL	320	9,137	640	5	CATTLE	03/01	02/28	100	60
00366	STOLEN	MAINTAIN	1,591	1,200	360	6	CATTLE	04/01	12/02	100	49
00367	STINEBAUGH	CUSTODIAL	40	4,803	-	2	CATTLE	03/01	02/28	100	12
00369	HERZBERG	MAINTAIN	909	6,694	640	10	CATTLE	03/01	02/28	100	121
00370	SWITZER	MAINTAIN	680	8,913	320	11	CATTLE	03/01	02/28	100	135

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
00371	KINGSLEY	CUSTODIAL	120	1,386	-	3	CATTLE	03/01	02/28	100	32
00373	NORTH TAYLOR ALLOT.	IMPROVE	2,833	7,528	40	27	CATTLE	04/01	11/25	100	212
00374	SOUTH TAYLOR	MAINTAIN	2,266	2,384	-	1	CATTLE	05/01	09/30	100	5
00375	LEO UNIT	MAINTAIN	964	4,131	640	1	HORSE	03/01	02/28	100	1
00376	TAYLOR RANCH AMP	MAINTAIN	4,167	1,916	640	6	CATTLE	03/01	02/28	100	71
00378	JONES	CUSTODIAL	315	4,805	-	8	CATTLE	03/01	02/28	100	96
00379	Z B BAR ALLOTMENT	MAINTAIN	3,489	4,683	-	6	CATTLE	03/01	02/28	100	75
00380	VOLLA UNIT	MAINTAIN	1,093	1,477	320	15	CATTLE	05/01	10/25	41	36
00381	STOCKER COULEE	CUSTODIAL	600	1,312	-	9	CATTLE	03/01	02/28	100	113
00384	TRIPP	CUSTODIAL	40	1,280	-	1	CATTLE	03/01	02/28	100	8
00385	DEAVER ALLOTMENT	IMPROVE	9,203	4,538	640	5	CATTLE	03/01	02/28	100	57
00386	NORTH	IMPROVE	2,759	2,057	320	1	CATTLE	04/25	11/25	100	10
00387	TVETEN	CUSTODIAL	380	1,279	-	7	CATTLE	03/01	02/28	100	84
00390	TWITCHELL ALLOTMENT	MAINTAIN	1,162	240	-	48	CATTLE	05/15	10/17	81	199
00391	TWITCHELL RANCH AMP	MAINTAIN	7,437	1,882	640	2	HORSE	03/01	02/28	100	30
00393	UTHAUG INDIVIDUAL	MAINTAIN	1,441	10,638	-	7	CATTLE	03/01	02/28	100	84
00395	STEADMAN ALLOTMENT	CUSTODIAL	2,959	11,776	960	18	CATTLE	03/01	02/27	100	215
00397	GLENN'S PLACE	CUSTODIAL	638	878	640	11	CATTLE	03/01	02/28	100	129
00398	WALLER	CUSTODIAL	519	2,154	-	8	CATTLE	03/01	02/28	100	104
00403	BURKE UNIT	MAINTAIN	1,932	9,246	631	19	CATTLE	03/01	02/28	100	230
00407	WATSON	MAINTAIN	960	4,181	640	15	CATTLE	03/01	02/28	100	183
00409	W BAR N	MAINTAIN	2,856	6,067	200	115	CATTLE	10/16	02/28	43	221
00410	WEEDING HOME PLACE	CUSTODIAL	160	7,288	-	2	CATTLE	03/01	02/28	100	24
00411	WEEDING RANCH	MAINTAIN	532	11,448	480	9	CATTLE	03/01	02/28	100	102
00412	DON WEST UNIT	CUSTODIAL	40	3,397	390	1	CATTLE	03/01	02/28	100	9
00414	WHEATCROFT	CUSTODIAL	40	8,173	-	2	CATTLE	05/01	10/31	100	11
00416	WHITE	MAINTAIN	840	7,989	640	18	CATTLE	03/01	02/28	100	216
00420	WILSON UNIT	CUSTODIAL	399	3,530	-	7	CATTLE	03/01	02/28	100	88
Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
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00421	HAIGHT	MAINTAIN	1,174	2,396	-	27	CATTLE	03/01	02/28	100	319
00424	MCKNIGHT	CUSTODIAL	1,027	5,456	-	18	CATTLE	03/01	02/28	100	216
00426	PINNACLE RANCH AMP	MAINTAIN	3,424	10,006	840	41	CATTLE	03/01	02/28	100	492
00427	MEHLING	CUSTODIAL	80	2,880	-	1	CATTLE	03/01	02/28	100	17
00428	SPRING CREEK	CUSTODIAL	80	520	-	2	CATTLE	03/01	02/28	100	20
00429	ZEMPLE INDIVIDUAL	MAINTAIN	1,281	10,675	640	4	CATTLE	03/01	02/28	100	50
00433	BLEVINS ALLOTMENT	MAINTAIN	502	4,128	-	1	CATTLE	03/01	02/28	100	6
00434	BOX ELDER	IMPROVE	2,442	2,642	320	1	CATTLE	05/20	08/19	82	2
00435	WALDIE	MAINTAIN	1,617	7,281	800	12	CATTLE	03/01	02/28	100	142
00436	MORELLA	CUSTODIAL	160	480	480	2	CATTLE	03/01	02/28	100	41
00439	MORRIS	CUSTODIAL	609	1,260	-	9	CATTLE	03/01	02/28	100	107
00440	FLASTED CREEK	CUSTODIAL	839	3,649	640	10	SHEEP	03/01	02/28	100	24
00443	JOHNSON CREEK	CUSTODIAL	277	9,261	-	2	CATTLE	03/01	02/28	100	20
00445	MURRAY	MAINTAIN	1,508	13,608	1,280	10	CATTLE	03/01	02/28	100	120
00448	THIRD CREEK	CUSTODIAL	320	908	-	7	CATTLE	03/01	02/28	100	82
00449	BLAIR	CUSTODIAL	40	760	-	2	CATTLE	03/01	02/28	100	10
00455	PENICK COULEE	MAINTAIN	2,596	1,958	165	42	CATTLE	03/01	02/28	95	500
00458	KUEHN	CUSTODIAL	120	1,182	-	2	CATTLE	03/01	02/28	100	24
00459	MCKEE & HOME	MAINTAIN	856	5,843	40	14	CATTLE	03/01	02/28	100	166
00460	DANIELS	CUSTODIAL	40	953	-	2	CATTLE	03/01	02/28	100	20
00463	DIAMOND R CK UNIT	MAINTAIN	1,776	4,262	640	25	CATTLE	03/01	02/28	100	300
00464	OCHSNER	MAINTAIN	941	2,266	-	7	CATTLE	03/01	02/28	100	88
00465	OCONNOR	CUSTODIAL	80	680	-	1	CATTLE	03/01	02/28	100	16
00467	ODEGARD UNIT	MAINTAIN	2,246	5,197	1,280	22	CATTLE	03/01	02/28	100	269
00468	WYO DRY CREEK	CUSTODIAL	634	470	643	2	CATTLE	03/01	02/28	100	30
00469	BAY HORSE-BOWERS	CUSTODIAL	480	4,005	627	9	CATTLE	03/01	02/28	100	113
00470	WENDELL UNIT	CUSTODIAL	320	2,598	640	1	CATTLE	03/01	02/28	100	8
00471	FRANKLIN	CUSTODIAL	600	2,927	-	9	CATTLE	03/01	02/28	100	111

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00472	NORTH EPSIE	CUSTODIAL	80	1,200	-	1	CATTLE	03/01	02/28	100	26
00474	GRAY DONALD H	CUSTODIAL	40	1,255	-	4	CATTLE	06/15	09/15	100	13
00475	SHEEP CAMP	CUSTODIAL	240	960	480	4	CATTLE	03/01	02/28	100	57
00476	DDN ALLOTMENT	CUSTODIAL	40	812	-	1	CATTLE	03/01	02/28	100	9
00478	RIVER ALLOTMENT	CUSTODIAL	320	8,032	-	7	CATTLE	03/01	02/28	100	86
00479	BRANCH CREEK	CUSTODIAL	632	5,395	-	1	CATTLE	03/01	02/28	100	4
00482	PETTIBONE	CUSTODIAL	40	1,267	831	1	CATTLE	03/01	02/28	100	13
00483	PHILLIPPI	MAINTAIN	925	3,754	640	15	CATTLE	03/01	02/28	100	175
00484	PIERCE	CUSTODIAL	160	1,245	-	5	CATTLE	03/01	02/28	100	59
00490	RANCH CREEK	CUSTODIAL	437	4,502	640	12	CATTLE	03/01	02/28	100	148
00491	POWERS	CUSTODIAL	80	8,973	640	2	CATTLE	03/01	02/28	100	24
00492	MURPHY AND SON	CUSTODIAL	40	6,199	640	1	CATTLE	03/01	02/28	100	7
00496	ALDINGER	CUSTODIAL	320	3,780	-	6	CATTLE	03/01	02/28	100	35
00497	POTATO BUTTES	CUSTODIAL	617	4,856	65	14	CATTLE	03/01	02/28	100	165
00498	HUMES	CUSTODIAL	1,145	-	12,864	12	CATTLE	03/01	02/28	100	143
00499	LEWIS	CUSTODIAL	277	7,301	-	2	CATTLE	03/01	02/28	100	28
00500	GUSSIE RICHARDS	MAINTAIN	3,041	2,937	640	1	SHEEP	03/01	02/28	100	1
00501	ASH DRAW	CUSTODIAL	455	6,257	-	3	CATTLE	03/01	02/28	100	39
00502	HIGGINS	IMPROVE	5,014	1,766	-	19	CATTLE	03/01	02/28	100	230
00503	RIESLAND	CUSTODIAL	120	2,595	-	3	CATTLE	03/01	02/28	100	40
00505	RINGLING	CUSTODIAL	413	16,025	960	5	CATTLE	03/01	02/28	100	62
00506	RITER	MAINTAIN	920	598	-	1	CATTLE	03/01	02/28	100	8
00507	TRIANGLE ELEVEN	MAINTAIN	1,698	6,300	-	34	CATTLE	03/01	02/28	100	418
00508	ROBINSON	MAINTAIN	326	5,081	-	7	CATTLE	03/01	02/28	100	79
00509	NASH	CUSTODIAL	80	480	-	2	CATTLE	03/01	02/28	100	27
00510	ROGERS	CUSTODIAL	872	6,703	-	11	CATTLE	03/01	02/28	100	139
00511	ROLPH	CUSTODIAL	105	1,373	-	2	CATTLE	03/01	02/28	100	28
00512	ROONEY	CUSTODIAL	684	3,161	-	12	CATTLE	04/01	12/30	100	111

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
00513	ROSE	CUSTODIAL	80	4,099	639	2	CATTLE	03/01	02/28	100	28
00516	ROW	CUSTODIAL	549	3,272	-	13	CATTLE	03/01	02/28	100	154
00517	ROWSEY	CUSTODIAL	240	80	-	5	CATTLE	12/08	02/28	73	10
00518	RUMPH	CUSTODIAL	40	800	-	1	CATTLE	03/01	02/28	100	10
00519	BROADUS PLACE	CUSTODIAL	880	1,440	-	18	CATTLE	03/01	02/28	100	212
00520	WILD BILL CREEK	MAINTAIN	802	1,920	-	20	CATTLE	03/01	02/19	100	234
00521	RUSSELL UNIT	CUSTODIAL	279	9,712	-	6	CATTLE	03/01	02/28	100	72
00522	RUSSELL AND RUMPH	MAINTAIN	4,216	11,631	1,920	78	CATTLE	03/01	02/28	100	942
00523	RUSSIFF	CUSTODIAL	320	1,439	-	6	CATTLE	03/01	02/28	100	77
00525	ROMO	CUSTODIAL	440	1,667	-	30	CATTLE	05/01	09/26	100	147
00526	ROYAN	CUSTODIAL	240	3,086	-	5	CATTLE	03/01	02/28	100	60
00527	ELGIN	CUSTODIAL	80	3,852	639	2	CATTLE	03/01	02/28	100	21
00528	PIERCE	CUSTODIAL	138	2,024	-	2	CATTLE	03/01	02/28	100	20
00529	SAMUELSON	CUSTODIAL	1,538	25,582	2,235	22	CATTLE	03/01	02/28	100	260
00530	GUTZ	MAINTAIN	962	3,269	320	15	CATTLE	03/01	02/28	100	187
00531	SANBURN	CUSTODIAL	160	480	-	2	CATTLE	03/01	02/28	100	25
00532	НОМЕ	MAINTAIN	202	800	640	3	CATTLE	03/01	02/28	100	42
00533	SAYE	MAINTAIN	1,398	2,218	880	18	CATTLE	03/01	02/28	100	219
00535	WRIGHT CREEK	MAINTAIN	1,195	4,264	-	25	CATTLE	03/01	02/28	100	305
00537	ERICKSON, ORVILLE	CUSTODIAL	80	2,271	-	2	CATTLE	03/01	02/28	100	18
00538	PANASUK, M & S	CUSTODIAL	191	400	-	3	CATTLE	05/01	10/31	100	21
00539	EAST LO CREEK	IMPROVE	2,508	2,767	-	2	CATTLE	03/01	02/28	100	25
00540	SCHAFFER	IMPROVE	586	560	-	1	HORSE	06/01	09/30	40	2
00541	SCHWEDE	CUSTODIAL	40	478	-	1	CATTLE	03/01	02/28	100	12
00542	SMITH	CUSTODIAL	160	600	-	3	CATTLE	03/01	02/28	100	40
00543	JOHNSON CREEK	MAINTAIN	4,433	11,988	640	49	CATTLE	03/01	02/28	100	589
00544	SMITH	CUSTODIAL	141	3,682	640	3	CATTLE	03/01	02/28	100	31
00545	SMITH RANCH	MAINTAIN	2,295	9,060	-	26	CATTLE	03/01	02/28	100	312

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
00546	PINE HILL	MAINTAIN	960	1,680	-	17	CATTLE	03/01	02/28	100	205
00547	RUSSELL CRK	CUSTODIAL	40	619	-	2	CATTLE	03/01	02/28	100	15
00548	SHANNON	CUSTODIAL	80	3,250	-	1	HORSE	03/01	02/28	100	13
00552	FIGHTING BUTTE	CUSTODIAL	280	640	-	1	CATTLE	03/01	02/28	100	12
00553	SULLIVAN	CUSTODIAL	320	3,281	-	5	CATTLE	03/01	02/28	100	59
00554	SUNSET	MAINTAIN	1,120	1,920	-	1	CATTLE	05/01	09/30	100	5
00555	DAILY CREEK	CUSTODIAL	919	2,026	-	18	CATTLE	03/01	02/28	100	220
00556	SMITH CREEK	CUSTODIAL	1,553	9,804	640	23	CATTLE	03/01	02/28	100	275
00557	RIPRAP COULEE	CUSTODIAL	840	4,478	-	19	CATTLE	03/01	02/28	100	227
00559	WOLFF, BERNARD	CUSTODIAL	17	2,019	-	1	CATTLE	03/01	02/28	100	9
00560	MUSKRAT CREEK	MAINTAIN	3,324	1,742	640	1	CATTLE	03/01	02/28	100	12
00562	TAUCK L & L	MAINTAIN	3,361	8,484	1,376	1	CATTLE	05/15	10/01	63	3
00564	TANNER LEASE	CUSTODIAL	517	2,916	-	10	CATTLE	03/01	02/28	100	124
00566	ENERSON	MAINTAIN	4,358	6,602	-	7	CATTLE	03/01	02/28	100	84
00568	TEIGEN	CUSTODIAL	240	2,080	-	4	CATTLE	03/01	02/28	100	47
00570	MATTSON PLACE	CUSTODIAL	40	1,240	-	1	CATTLE	03/01	02/28	100	8
00571	COTTONWOOD	MAINTAIN	2,431	4,147	-	1	CATTLE	03/01	02/28	100	10
00574	FAILINGS	MAINTAIN	10,452	27,795	1,760	202	CATTLE	03/01	02/28	100	2424
00575	DAMM PLACE	MAINTAIN	1,040	1,920	-	11	CATTLE	03/01	02/28	100	138
00577	HOME	CUSTODIAL	360	3,322	1,280	5	CATTLE	03/01	02/28	100	61
00579	ROSENCRANZ	CUSTODIAL	270	1,643	-	5	CATTLE	03/01	02/28	100	57
00581	TRAUB	CUSTODIAL	480	3,300	-	15	CATTLE	05/01	11/30	100	107
00583	TRAUB	MAINTAIN	1,372	3,034	640	21	CATTLE	03/01	02/28	100	256
00584	TRAUTMAN	CUSTODIAL	40	1,161	-	3	SHEEP	03/01	02/28	100	7
00585	JOSLYN UNIT	CUSTODIAL	324	2,050	-	6	CATTLE	03/01	02/28	100	73
00587	ULLRICH	CUSTODIAL	40	1,113	-	6	SHEEP	03/01	02/28	100	16
00588	FORTYFOUR CREEK	MAINTAIN	4,779	18,937	640	60	CATTLE	03/01	02/28	100	721
00590	BUTTE CREEK	MAINTAIN	1,615	1,582	8	1	CATTLE	03/01	02/28	100	12

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
00591	RIVER UNIT	CUSTODIAL	367	1,719	-	10	CATTLE	03/01	02/28	100	113
00595	WALTER	CUSTODIAL	40	1,315	-	1	CATTLE	03/01	02/28	100	10
00596	WATT CREEK	CUSTODIAL	360	1,379	-	6	CATTLE	03/01	02/28	100	75
00597	WASHINGTON	MAINTAIN	2,670	2,945	2,780	46	CATTLE	03/01	02/28	100	553
00598	WATTERS FARM	CUSTODIAL	610	6,895	-	11	CATTLE	03/01	02/28	100	131
00599	MITCHELL CREEK	CUSTODIAL	285	1,585	-	7	CATTLE	03/01	02/28	100	83
00612	DUNN ALLOTMENT	MAINTAIN	718	719	-	58	CATTLE	05/01	10/17	47	152
00616	BRAGG	MAINTAIN	430	1,655	320	7	CATTLE	03/01	02/28	100	89
00620	THORGAARD NON-AMP	MAINTAIN	520	1,240	-	14	CATTLE	03/01	02/28	100	171
00621	CURTIS UNIT	CUSTODIAL	480	2,395	640	6	CATTLE	03/01	02/28	100	74
00622	CHERRY CREEK SHEEP	MAINTAIN	11,876	58,546	5,120	1	CATTLE	03/01	08/15	100	6
00625	NORTH	CUSTODIAL	40	5,452	-	1	CATTLE	03/01	02/28	100	13
00626	SOUTH	CUSTODIAL	71	3,378	-	2	CATTLE	03/01	02/28	100	24
00628	O'BRIEN UNIT	CUSTODIAL	1,080	10,859	640	12	CATTLE	03/01	02/28	100	146
00629	ERNEST CREEK	CUSTODIAL	235	2,441	-	3	CATTLE	03/01	02/28	100	45
00630	CROW CREEK	MAINTAIN	7,322	5,489	8,600	1	CATTLE	03/01	02/28	100	9
00631	GASKILL	CUSTODIAL	314	2,366	-	9	CATTLE	03/01	02/28	100	116
00635	SCHULTZ	MAINTAIN	2,420	3,538	-	1	CATTLE	05/01	10/31	100	6
00641	NORTH LUTHER	CUSTODIAL	960	960	-	6	CATTLE	03/01	02/28	100	69
00642	SMITH	CUSTODIAL	40	770	-	1	CATTLE	03/01	02/28	100	10
00645	HARMON FARMS	CUSTODIAL	82	9,183	1,310	2	CATTLE	03/01	02/28	100	18
00646	HOFF	CUSTODIAL	40	960	253	1	CATTLE	03/01	02/28	100	10
00657	STENSETH	CUSTODIAL	328	1,155	-	4	CATTLE	03/01	02/28	100	50
00658	САРР	IMPROVE	1,535	1,173	543	1	CATTLE	03/01	02/28	100	15
00659	TURNER	CUSTODIAL	240	1,080	-	5	CATTLE	03/01	02/28	100	62
00667	SPILLMAN CRK	CUSTODIAL	20	3,900	-	1	CATTLE	03/01	02/28	100	6
00669	BELLTOWER	MAINTAIN	6,015	3,396	130	5	CATTLE	03/01	02/28	100	64
00672	HUBBARD UNIT	CUSTODIAL	200	2,524	-	3	CATTLE	03/01	02/28	100	37

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00678	MYSSE UNIT	MAINTAIN	800	19,234	1,280	8	CATTLE	03/01	02/28	100	100
00681	BELLE CREEK	MAINTAIN	941	2,041	-	2	HORSE	03/01	02/28	100	32
00686	HABER	CUSTODIAL	320	640	-	60	CATTLE	05/15	09/01	34	74
00687	LELAND ALLOTMENT	MAINTAIN	1,324	4,921	-	20	CATTLE	05/01	11/25	100	137
00688	MACKAY - RIEGER	MAINTAIN	640	7,686	640	12	CATTLE	03/01	02/28	100	147
00694	NEMITZ/WIBAUX COUNTY	MAINTAIN	1,249	2,720	320	126	CATTLE	05/15	08/15	70	270
00699	KITTELMANN	CUSTODIAL	87	1,182	-	2	CATTLE	03/01	02/28	100	19
00700	CAREY	CUSTODIAL	320	3,206	640	5	CATTLE	03/01	02/28	100	64
00703	JACK CREEK UNIT	MAINTAIN	1,427	4,803	640	19	CATTLE	03/01	02/28	100	232
00705	HALVORSON	CUSTODIAL	560	600	-	11	CATTLE	03/01	02/28	100	127
00706	BEACH	CUSTODIAL	80	880	-	2	CATTLE	03/01	02/28	100	24
00707	DUCHARME	CUSTODIAL	360	600	-	7	CATTLE	03/01	02/28	100	83
00708	BOYER-GRAHAM	MAINTAIN	665	2,647	-	1	CATTLE	05/01	09/30	100	5
00709	STAR X	CUSTODIAL	160	131,280	-	6	CATTLE	05/01	10/31	100	36
00711	TUNBY	CUSTODIAL	313	6,347	-	5	CATTLE	05/01	10/31	100	30
00712	GOLDIE UNIT	MAINTAIN	645	641	-	16	CATTLE	03/01	02/26	100	189
00713	BROST UNIT	CUSTODIAL	532	1,600	-	37	CATTLE	06/01	09/26	100	144
00714	DOLATTA ALLOTMENT	MAINTAIN	1,023	2,920	-	3	CATTLE	03/01	02/28	100	36
00715	GRIST	MAINTAIN	952	4,872	640	23	CATTLE	03/01	02/28	100	270
00716	MCRAE	MAINTAIN	1,874	11,231	640	34	CATTLE	03/01	02/28	100	410
00718	ARLEN UNIT	CUSTODIAL	200	200	-	2	CATTLE	03/01	02/28	100	24
00721	FORREST PRICE	CUSTODIAL	40	119	-	2	CATTLE	03/01	02/28	100	10
00722	REED	MAINTAIN	715	13,230	-	14	CATTLE	03/01	02/28	100	160
00724	MURRAY	CUSTODIAL	80	3,707	640	4	CATTLE	03/01	05/01	100	8
00725	SCHEPENS	MAINTAIN	774	1,438	-	13	CATTLE	03/01	02/28	100	152
00726	FOLLMER LEASE	MAINTAIN	599	640	160	15	CATTLE	03/01	02/28	100	185
00730	L-7 RANCH	CUSTODIAL	160	1,120	-	4	CATTLE	03/01	02/24	100	47
00731	DYBA UNIT	MAINTAIN	2,849	21,991	640	57	CATTLE	03/01	02/28	100	680

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00732	NEWMAN PLACE	MAINTAIN	320	9,859	640	8	CATTLE	03/01	02/28	100	98
00738	DESAYE UNIT	MAINTAIN	641	4,048	-	11	CATTLE	03/01	02/28	100	125
00739	BIERY ALLOTMENT	MAINTAIN	1,320	10,682	1,280	1	CATTLE	03/01	02/28	100	17
00743	DUKART-DAWSON	CUSTODIAL	331	1,619	-	14	CATTLE	03/01	02/28	100	95
00749	PINNOW UNIT	MAINTAIN	160	1,760	-	3	CATTLE	03/01	02/28	100	34
00750	KALBERG UNIT	MAINTAIN	1,279	5,422	-	5	CATTLE	03/01	02/28	100	65
00754	SCHULTZ	CUSTODIAL	115	1,817	760	3	CATTLE	03/01	02/28	100	38
00757	GREASEWOOD	CUSTODIAL	13	17	-	1	HORSE	03/01	02/28	100	3
00773	BOUGHTON PLACE	CUSTODIAL	175	3,572	-	4	CATTLE	03/01	02/28	100	47
00774	KNUTHS-DAWSON	CUSTODIAL	410	13,149	1,280	4	CATTLE	03/01	02/28	100	53
00776	WAYNE KUEHN	CUSTODIAL	2,089	1,904	-	1	CATTLE	05/01	07/01	100	2
00777	PASTURE CREEK	CUSTODIAL	40	2,480	-	1	CATTLE	03/01	02/28	100	11
00778	COW CREEK	MAINTAIN	2,442	7,503	-	35	CATTLE	05/01	02/28	100	350
00779	COMMON	MAINTAIN	1,400	4,980	640	1	CATTLE	03/01	07/14	100	4
00780	WINTER PASTURE	MAINTAIN	3,026	1,128	-	1	CATTLE	05/15	06/15	69	1
00781	BEAN CREEK	CUSTODIAL	643	1,616	-	15	CATTLE	03/01	02/28	100	174
00783	BOWERS CREEK	CUSTODIAL	120	1,160	-	2	CATTLE	03/01	02/28	100	31
00784	LOWER PEARCE	CUSTODIAL	239	1,598	-	7	CATTLE	03/01	02/28	100	77
00785	HOGBACK ALLOTMENT	MAINTAIN	706	3,593	640	14	CATTLE	03/01	02/28	100	168
00786	SOUTH	IMPROVE	2,823	1,193	-	101	CATTLE	04/15	10/27	66	430
00787	FLINTHEART DRAW	IMPROVE	1,125	800	-	23	CATTLE	03/01	02/15	62	165
00788	WELLS COULEE	MAINTAIN	678	2,757	720	12	CATTLE	03/01	02/28	100	136
00789	TWITCHELL EAST	CUSTODIAL	240	1,600	-	4	CATTLE	03/01	02/28	100	48
00790	EAST SPRING COULEE	CUSTODIAL	40	5,093	-	1	CATTLE	03/01	02/28	100	7
00793	WOODFORD	CUSTODIAL	160	13,809	1,280	1	CATTLE	03/01	02/28	100	8
00794	SOUTH ALLOTMENT	CUSTODIAL	480	10,621	320	4	CATTLE	03/01	02/28	100	48
00797	SANDHILL	MAINTAIN	1,772	8,067	150	29	CATTLE	03/01	02/28	100	349
00800	ZIMMERMAN	CUSTODIAL	40	520	-	2	CATTLE	03/01	02/28	100	10

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00801	WALKER ALLOTMENT	CUSTODIAL	40	588	-	1	CATTLE	03/01	02/28	100	11
00802	TOEWS ALLOTMENT	CUSTODIAL	40	680	-	1	CATTLE	03/01	02/28	100	7
00803	HARSTAD/RABE	CUSTODIAL	160	4,117	640	2	CATTLE	03/01	02/28	100	33
00805	N. FORK SHEEP CR.	MAINTAIN	956	793	-	42	CATTLE	06/01	09/01	50	64
00806	ADAMS	MAINTAIN	4,103	2,749	1,280	71	CATTLE	03/01	02/28	100	856
00807	HIRSCH	CUSTODIAL	245	2,795	640	7	CATTLE	03/01	02/28	100	84
00810	BADLAND	MAINTAIN	640	640	-	30	CATTLE	07/01	08/26	100	56
00812	LJ SWITZER	MAINTAIN	240	10,914	520	12	CATTLE	05/01	10/30	100	72
00814	NEWELL CREEK	CUSTODIAL	147	1,482	532	3	CATTLE	03/01	02/28	100	32
00815	FISHER	MAINTAIN	1,429	1,635	320	31	CATTLE	03/01	02/28	100	376
00817	DAWSON	CUSTODIAL	720	4,169	-	12	CATTLE	03/01	02/28	100	144
00824	BAINTER	MAINTAIN	960	6,115	640	20	CATTLE	03/01	02/28	100	244
00829	DEAN WANG	CUSTODIAL	200	3,290	640	4	CATTLE	03/01	02/28	100	50
00830	CHISEL PASTURE	MAINTAIN	375	400	-	16	CATTLE	05/01	10/28	100	95
00831	BURDETTE CREEK	CUSTODIAL	40	2,680	-	1	CATTLE	03/01	02/28	100	4
00832	BUMGARDNER	CUSTODIAL	160	640	-	2	CATTLE	03/01	02/28	100	16
00833	CLAIM CREEK	CUSTODIAL	38	1,517	629	1	CATTLE	03/01	02/28	100	6
00834	KINCHELOE UNIT	CUSTODIAL	40	4,001	640	1	CATTLE	05/01	10/31	100	8
00835	L-S	MAINTAIN	12,523	9,554	1,600	2	CATTLE	03/01	02/28	100	28
00836	MELUM	CUSTODIAL	88	1,160	640	1	CATTLE	03/01	02/28	100	11
00837	BEAR SKULL CREEK	CUSTODIAL	74	638	-	1	CATTLE	03/01	02/28	100	10
00838	BOBCAT CREEK	MAINTAIN	1,355	4,420	640	17	CATTLE	03/01	02/28	100	202
00839	HAY CREEK	MAINTAIN	713	3,441	-	19	CATTLE	03/01	02/28	100	226
00840	C & P ROMO	CUSTODIAL	40	109	-	1	CATTLE	03/01	02/28	100	13
00841	EAST POTATO	CUSTODIAL	132	1,215	-	1	CATTLE	03/01	02/28	100	12
00843	UNALLOCATED - COWLES	CUSTODIAL	145	320	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
00846	LITTLE PINE	MAINTAIN	400	7,189	640	7	CATTLE	03/01	02/28	100	88
00848	HAXTON	CUSTODIAL	40	299	-	1	CATTLE	03/01	02/28	100	9

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00849	FS UNIT	CUSTODIAL	320	640	-	1	HORSE	03/01	02/28	100	11
00851	CHERRY CREEK	CUSTODIAL	803	3,148	640	9	CATTLE	03/01	02/28	100	112
00852	THREE BAR CREEK	MAINTAIN	3,076	11,268	640	40	CATTLE	03/01	02/28	100	478
00853	J&K	MAINTAIN	5,440	3,839	-	1	CATTLE	03/01	02/28	100	13
00854	SCOT	MAINTAIN	1,301	7,362	1,280	19	CATTLE	03/01	02/28	100	224
00857	MIDDLE FORK	MAINTAIN	960	4,479	640	20	CATTLE	03/01	02/28	100	246
00858	ROCKY TOP	MAINTAIN	320	480	-	45	CATTLE	08/01	09/29	100	89
00890	HARWOOD	CUSTODIAL	160	2,143	-	1	CATTLE	03/01	02/28	100	16
00892	ROAD CREEK	MAINTAIN	2,379	9,824	-	25	CATTLE	03/01	02/28	100	294
00893	LAGGE/FORGAARD	MAINTAIN	748	5,899	-	13	CATTLE	03/01	02/28	100	156
00895	NORTH OWL CREEK	IMPROVE	1,355	797	-	6	HORSE	06/01	02/28	55	30
00925	REILLY HMP	MAINTAIN	3,862	640	-	150	CATTLE	04/14	12/20	86	1065
00942	LUTZ ALLOT	CUSTODIAL	80	974	-	1	CATTLE	03/01	02/28	100	16
00945	KETTERLING ALLOTMENT	CUSTODIAL	960	960	640	1	CATTLE	05/20	06/20	68	1
00948	CRP	CUSTODIAL	437	1,751	320	10	CATTLE	03/01	02/28	100	124
00968	PETRE ALLOTMENT	CUSTODIAL	720	2,379	1,278	6	CATTLE	03/01	02/28	100	71
00972	OLD HAYNES PLACE	CUSTODIAL	40	440	-	1	CATTLE	03/01	02/28	100	13
00973	VOLLA	CUSTODIAL	192	1,625	-	4	CATTLE	03/01	02/28	100	45
00979	WANG PASTURE	CUSTODIAL	275	380	-	25	CATTLE	06/15	09/02	100	66
00980	COUNTY PASTURE	CUSTODIAL	135	218	-	2	CATTLE	03/01	02/28	100	27
00981	SECTION 10	CUSTODIAL	320	-	-	57	CATTLE	06/01	08/27	100	72
00988	HORSE CREEK	CUSTODIAL	302	5,040	640	4	CATTLE	03/01	02/28	100	46
00993	LOOMIS	CUSTODIAL	425	1,360	640	5	CATTLE	03/01	02/28	100	66
00995	HESS BROTHERS	CUSTODIAL	40	2,520	-	1	CATTLE	03/01	02/28	100	10
00998	CABIN CREEK	CUSTODIAL	160	2,551	-	3	CATTLE	03/01	02/28	100	34
01002	M E UNIT	CUSTODIAL	200	3,270	-	40	CATTLE	06/15	10/31	33	60
01004	LUND ALLOTMENT	MAINTAIN	2,712	2,120	-	65	CATTLE	03/01	05/15	43	70
01005	MEDEARIS - SCHYE	CUSTODIAL	200	393	-	4	CATTLE	03/01	02/28	100	50

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
01006	MCNAMARA UNIT	CUSTODIAL	640	994	640	18	CATTLE	03/01	02/28	100	212
01007	BECHTOLD	CUSTODIAL	320	5,950	-	8	CATTLE	03/01	02/28	100	45
01009	SANDSTONE CREEK UNIT	MAINTAIN	4,670	9,039	1,280	7	CATTLE	03/01	02/28	100	83
01011	BIRTIC	CUSTODIAL	40	128	-	2	CATTLE	05/01	10/31	100	12
01012	BLASER LEASE	CUSTODIAL	240	1,450	-	5	CATTLE	03/01	02/28	100	68
01018	RENO PLACE	MAINTAIN	3,193	14,055	1,920	45	CATTLE	03/01	02/28	100	538
01019	L. EHRET	MAINTAIN	640	800	320	25	CATTLE	05/01	11/15	100	164
01020	BUERKLE BROTHERS	CUSTODIAL	440	642	-	10	CATTLE	03/01	02/28	100	120
01021	EVANS	IMPROVE	320	640	-	30	CATTLE	05/01	08/09	100	100
01022	MCGEE UNIT	MAINTAIN	640	1,904	-	22	CATTLE	04/01	10/30	100	154
01023	BURKLE	MAINTAIN	720	1,200	-	2	CATTLE	03/01	02/28	100	24
01025	CHRISTMAN	CUSTODIAL	160	400	-	6	CATTLE	05/01	11/07	100	38
01026	ESTHER UNIT	CUSTODIAL	40	320	-	1	CATTLE	03/01	02/28	100	5
01028	R. W. IRVINE	MAINTAIN	640	1,920	-	75	CATTLE	05/15	07/21	100	168
01029	COOPER	MAINTAIN	1,280	640	-	60	CATTLE	05/01	10/30	100	361
01030	URVIN PLACE	MAINTAIN	600	3,803	360	22	CATTLE	04/15	11/15	100	156
01031	CRAWFORD	MAINTAIN	320	399	313	25	CATTLE	06/01	10/06	55	58
01032	CHUNN UNIT	CUSTODIAL	280	4,800	640	7	CATTLE	03/01	02/28	100	87
01033	DEGRAND	MAINTAIN	1,600	3,387	-	55	CATTLE	07/01	12/28	49	160
01035	DIETZ	CUSTODIAL	1,280	1,120	-	53	CATTLE	05/01	11/01	100	322
01036	MASTERSON	CUSTODIAL	599	652	-	14	CATTLE	03/01	02/28	100	171
01037	DRANGE	CUSTODIAL	80	3,633	920	1	HORSE	03/01	02/28	100	1
01039	DUFFIELD	CUSTODIAL	798	2,390	-	14	CATTLE	03/01	02/28	100	162
01041	FLOYD EHRET	CUSTODIAL	80	808	-	2	CATTLE	03/01	02/28	100	16
01042	ENGESSER UNIT	CUSTODIAL	640	3,842	-	14	CATTLE	03/01	02/28	100	164
01043	ENOS	CUSTODIAL	40	1,520	-	1	CATTLE	03/01	02/28	100	12
01045	FRIED	CUSTODIAL	80	1,760	-	1	CATTLE	03/01	02/28	100	22
01046	FUCHS ALLOTMENT	MAINTAIN	960	4,139	640	21	CATTLE	03/01	02/28	100	248

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
01047	GEVING	CUSTODIAL	320	640	-	6	CATTLE	05/01	10/30	100	36
01049	GILMORE LEASE	MAINTAIN	403	1,671	-	7	CATTLE	03/01	02/28	100	87
01051	ASH CREEK UNIT	MAINTAIN	2,515	10,342	1,760	14	CATTLE	03/01	02/13	100	161
01053	CAPROCK RANCH	MAINTAIN	1,202	15,021	1,600	24	CATTLE	03/01	02/28	100	283
01055	HALMANS	CUSTODIAL	320	2,800	640	14	CATTLE	05/01	10/30	100	84
01056	HALL	MAINTAIN	3,135	11,054	1,280	7	CATTLE	03/01	02/28	100	89
01057	HANRATTY	CUSTODIAL	320	3,520	-	7	CATTLE	05/01	10/31	100	41
01058	M HAUGHIAN/CUSTER CO	CUSTODIAL	80	2,564	1,263	2	CATTLE	03/01	02/28	100	17
01060	MIGRATTI	CUSTODIAL	222	2,305	640	4	CATTLE	03/01	02/28	100	56
01062	SPEARS	CUSTODIAL	640	4,792	320	20	CATTLE	11/01	02/28	100	79
01063	HOUGH PLACE	MAINTAIN	440	3,356	640	8	CATTLE	03/01	02/28	100	96
01064	HOUSEHOLDER	MAINTAIN	2,237	2,880	-	2	CATTLE	09/15	10/18	72	2
01065	HUETHER	CUSTODIAL	200	1,604	-	5	CATTLE	03/01	02/28	100	60
01067	COLDWELL	MAINTAIN	2,769	3,200	-	298	CATTLE	06/15	09/15	38	346
01068	HADLEY	CUSTODIAL	400	3,724	-	9	CATTLE	03/01	02/28	100	106
01071	KIRSCHTEN	MAINTAIN	480	800	-	8	CATTLE	03/01	02/28	100	92
01072	KLOS	MAINTAIN	320	1,501	741	5	CATTLE	03/01	02/28	100	68
01073	KNIPFER	CUSTODIAL	318	2,414	480	8	CATTLE	03/01	02/28	100	96
01075	KNUTHS CATTLE CO.	MAINTAIN	1,717	9,371	640	3	CATTLE	03/01	02/28	100	31
01077	J. O'CONNOR	MAINTAIN	760	3,453	640	12	CATTLE	03/01	02/28	100	145
01078	LABREE	CUSTODIAL	640	10,438	640	14	CATTLE	03/01	02/28	100	164
01079	KORTH UNIT	CUSTODIAL	320	320	-	8	CATTLE	03/01	02/28	100	95
01080	LANG	CUSTODIAL	160	1,280	-	9	CATTLE	05/01	11/01	100	55
01082	LESTAR INDIVIDUAL	IMPROVE	451	2,240	640	10	CATTLE	03/01	02/28	100	110
01083	LOGAR	CUSTODIAL	120	3,000	-	3	CATTLE	03/01	02/28	100	32
01084	LOSING	CUSTODIAL	320	960	-	15	CATTLE	05/15	10/30	100	83
01086	ROGER LOSING	CUSTODIAL	440	2,120	-	6	CATTLE	03/01	02/28	100	76
01087	LOVEC	CUSTODIAL	360	1,160	-	8	CATTLE	05/01	11/01	100	49

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
01089	MADLER	CUSTODIAL	320	320	-	30	CATTLE	05/15	08/29	92	97
01092	ART TRONSTAD	CUSTODIAL	160	480	-	3	CATTLE	03/01	02/28	100	36
01093	A. L. UNIT	CUSTODIAL	40	1,440	80	1	CATTLE	03/01	02/28	100	12
01094	MECCAGE	MAINTAIN	3,884	6,840	320	237	CATTLE	06/10	09/10	45	331
01095	OPEN 8	CUSTODIAL	720	2,945	-	15	CATTLE	03/01	02/28	100	189
01096	MELCHER LEASE	CUSTODIAL	719	4,786	640	15	CATTLE	03/01	02/28	100	180
01098	MOLINE	CUSTODIAL	160	641	-	2	CATTLE	03/01	02/28	100	24
01099	DAY UNIT	CUSTODIAL	115	320	-	12	CATTLE	05/01	08/04	100	38
01100	MORRISON	CUSTODIAL	120	640	640	2	CATTLE	03/01	02/28	100	34
01102	MURPHY	MAINTAIN	3,529	5,297	1,280	345	CATTLE	06/15	12/04	49	962
01104	NICHOLS	CUSTODIAL	280	920	-	6	CATTLE	03/01	02/28	100	72
01106	BICKLE INC.	MAINTAIN	1,840	9,738	1,280	45	CATTLE	03/01	02/28	100	540
01109	OSTENDORF	CUSTODIAL	1,250	8,584	640	20	CATTLE	03/01	02/28	100	247
01110	PALM	CUSTODIAL	1,279	18,479	2,560	27	CATTLE	03/01	02/28	100	324
01111	PETERSON/CELANDER	CUSTODIAL	80	200	-	2	CATTLE	03/01	02/28	100	20
01112	PHEBUS	CUSTODIAL	60	2,577	-	2	CATTLE	03/01	02/28	100	12
01114	BOESPFLUG UNIT	CUSTODIAL	160	1,120	-	3	CATTLE	03/01	02/28	100	38
01115	POST PLACE	MAINTAIN	400	200	-	2	HORSE	06/01	08/31	100	6
01116	RAMBUR	CUSTODIAL	274	382	-	8	CATTLE	03/01	02/28	100	93
01117	REDMAN	CUSTODIAL	628	2,869	-	28	CATTLE	03/01	02/28	100	170
01118	SCOTT UNIT	CUSTODIAL	80	1,198	-	1	CATTLE	05/01	10/31	100	9
01119	RIEGER, ROY	CUSTODIAL	40	956	-	1	CATTLE	03/01	02/28	100	3
01120	RIEGER	MAINTAIN	760	1,320	-	11	CATTLE	03/01	02/28	100	143
01123	RUSLEY ALLOTMENT	MAINTAIN	1,681	5,899	40	4	CATTLE	03/01	02/28	100	44
01124	RUSLEY	MAINTAIN	1,612	2,614	640	1	CATTLE	06/15	07/30	49	1
01125	SCHAEFER UNIT	CUSTODIAL	320	1,299	-	6	CATTLE	03/01	02/28	100	72
01127	VERNARD'S PLACE	CUSTODIAL	240	378	-	5	CATTLE	03/01	02/28	100	67
01128	SCHOUBOE	CUSTODIAL	640	160	-	2	CATTLE	03/01	02/28	100	25

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01129	GLIDEWELL	MAINTAIN	400	4,523	640	9	CATTLE	03/01	02/28	100	103
01130	SCHWEIGERT	CUSTODIAL	320	3,362	-	28	CATTLE	04/01	06/30	100	84
01133	SIELER	MAINTAIN	800	480	-	4	CATTLE	03/01	02/28	100	49
01134	SIKORSKI	MAINTAIN	400	4,131	-	19	CATTLE	05/01	10/30	100	114
01135	SINGER	CUSTODIAL	440	2,860	-	14	CATTLE	05/01	10/30	100	84
01136	SIPMA	CUSTODIAL	320	1,600	-	7	CATTLE	03/01	02/28	100	86
01137	DAGNALL UNIT	CUSTODIAL	5,463	34,799	1,649	3	CATTLE	03/01	02/28	100	37
01138	SONSALLA	MAINTAIN	346	790	-	8	CATTLE	03/01	02/28	100	95
01140	TOBIN UNIT	CUSTODIAL	1,120	10,560	800	24	CATTLE	03/01	02/28	100	281
01141	SPARKS	CUSTODIAL	320	960	-	9	CATTLE	03/01	02/28	100	99
01143	STARK	CUSTODIAL	320	3,160	640	6	CATTLE	03/01	02/28	100	72
01144	STEFFES UNIT	CUSTODIAL	160	2,960	640	8	CATTLE	05/01	10/31	100	48
01145	STICKNEY	MAINTAIN	480	1,949	-	6	CATTLE	05/01	10/26	100	35
01147	HEGGE	IMPROVE	2,504	2,755	-	204	CATTLE	06/01	11/16	47	533
01149	TRONSTAD	MAINTAIN	400	720	-	9	CATTLE	03/01	02/28	100	107
01151	HARRIS CREEK	MAINTAIN	916	6,957	640	23	CATTLE	05/01	11/01	100	140
01152	WANG BROTHERS	CUSTODIAL	160	960	-	3	CATTLE	03/01	02/28	100	34
01153	LUDWIG UNIT	CUSTODIAL	320	3,520	-	1	CATTLE	05/01	10/31	100	6
01154	WENZ	IMPROVE	1,280	2,560	320	13	CATTLE	04/01	10/25	100	89
01155	WILLMAN	MAINTAIN	842	480	-	60	CATTLE	04/01	10/28	57	237
01156	WOLENETZ FARMS	MAINTAIN	620	560	320	14	CATTLE	03/01	02/28	100	167
01157	WOLENETZ & SONS	CUSTODIAL	80	6,459	960	2	CATTLE	03/01	02/28	100	21
01158	WYRICK	MAINTAIN	120	1,800	-	3	CATTLE	03/01	02/28	100	30
01160	ZUPANIK	CUSTODIAL	40	2,120	-	1	CATTLE	03/01	02/28	100	12
01162	MUNSELL UNIT	IMPROVE	640	3,200	-	15	CATTLE	03/01	02/28	100	174
01163	THIELEN	MAINTAIN	399	2,928	640	8	CATTLE	03/01	02/28	100	97
01164	O'CONNOR/EHRET UNIT	MAINTAIN	641	640	640	30	CATTLE	05/01	10/27	100	178
01167	JAMES	MAINTAIN	307	3,271	-	1	HORSE	03/01	02/28	100	5

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01169	BEARDSLEY - ECCSGD	MAINTAIN	1,090	5,401	640	4	HORSE	03/01	02/28	100	48
01170	MAY, E.C.G.D.	MAINTAIN	1,411	1,383	160	105	CATTLE	03/01	02/28	37	468
01175	WOODRUFF	MAINTAIN	702	1,940	-	4	HORSE	03/01	02/28	100	48
01177	DRANGE - EAST CUSTER	CUSTODIAL	1,920	8,001	640	1	HORSE	03/01	02/28	100	3
01184	ASH CREEK UNIT/ECSGD	CUSTODIAL	160	1,070	-	4	CATTLE	03/01	02/28	100	29
01185	BUFORD UNIT	MAINTAIN	960	1,280	-	40	CATTLE	05/01	11/21	100	270
01186	H & W - EAST CUSTER	MAINTAIN	960	7,204	640	28	CATTLE	04/01	11/30	100	225
01187	SCHLOSSER	MAINTAIN	645	863	320	18	CATTLE	03/01	02/28	100	214
01188	FINCH UNIT	CUSTODIAL	143	640	-	1	HORSE	04/01	11/30	100	1
01189	HOPKINS ECSGD	MAINTAIN	2,710	2,003	-	97	CATTLE	05/15	11/15	100	590
01190	HOUGH LEASE	MAINTAIN	640	626	-	18	CATTLE	03/01	12/04	86	142
01191	KELLY	MAINTAIN	498	1,925	-	14	CATTLE	04/01	11/27	100	111
01194	EMMETT UNIT	CUSTODIAL	680	10,438	640	12	CATTLE	03/01	02/28	100	142
01197	OSTER	MAINTAIN	1,280	2,960	-	1	HORSE	03/01	02/28	100	12
01198	RANUM	CUSTODIAL	320	1,280	-	1	HORSE	03/01	02/28	91	11
01201	SCHYE LEASE	CUSTODIAL	390	1,280	-	75	CATTLE	05/01	10/20	23	98
01202	TRIANGLE T ALLOTMENT	MAINTAIN	1,510	6,524	640	35	CATTLE	03/01	02/28	100	414
01204	ALLERDINGS	MAINTAIN	640	320	599	66	CATTLE	06/15	08/24	100	154
01205	BILLINGSLEY	CUSTODIAL	399	640	-	7	CATTLE	03/01	02/28	100	82
01206	BRUSKI	CUSTODIAL	320	1,427	-	7	CATTLE	03/01	02/28	100	84
01207	GREGERSON UNIT	MAINTAIN	639	960	-	6	CATTLE	03/01	02/28	100	71
01208	COLLIE	CUSTODIAL	320	960	-	15	CATTLE	05/01	10/25	100	88
01209	IRVINE - RED BUTTES	CUSTODIAL	160	960	-	4	CATTLE	03/01	01/24	100	43
01210	EHRET LAND	MAINTAIN	1,445	3,834	-	1	CATTLE	03/01	02/28	100	7
01211	OTILTA UNIT	MAINTAIN	720	1,714	-	1	CATTLE	03/01	02/28	100	18
01212	GREENLEE	MAINTAIN	730	1,440	-	13	CATTLE	04/15	12/11	97	100
01213	J O'CONNOR/RED BUTTE	CUSTODIAL	160	3,453	-	4	CATTLE	03/01	02/28	100	42
01214	PIPELINE PASTURE	MAINTAIN	685	320	-	11	CATTLE	06/01	09/25	100	42

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
01215	NEUMANN	MAINTAIN	1,280	2,719	-	7	CATTLE	03/01	02/12	100	80
01216	SCHUETZLE	MAINTAIN	710	960	-	1	CATTLE	03/01	02/28	100	12
01217	DOUBLE A	MAINTAIN	920	2,880	-	4	CATTLE	03/01	02/28	100	44
01218	HERBST UNIT	MAINTAIN	778	1,059	-	27	CATTLE	04/15	12/09	100	212
01220	STRAUB	MAINTAIN	640	1,280	-	160	CATTLE	05/20	10/15	100	359
01222	CONNIE	CUSTODIAL	40	704	-	2	CATTLE	11/14	02/28	100	7
01223	SHEFFIELD	MAINTAIN	2,767	31,600	1,280	38	CATTLE	03/01	02/28	100	454
01224	TIMBER CREEK PASTURE	MAINTAIN	1,572	960	-	90	CATTLE	05/01	09/29	100	450
01225	FRANK BAN INDIVIDUAL	IMPROVE	9,271	4,079	640	322	CATTLE	03/01	02/28	67	2589
01228	BIEBER	MAINTAIN	530	2,240	-	1	CATTLE	06/15	08/15	100	2
01229	LOCKIE	CUSTODIAL	490	2,163	640	9	CATTLE	03/01	02/28	100	52
01230	BRYAN	CUSTODIAL	320	747	-	8	CATTLE	03/01	02/28	100	93
01231	JOANNE MADDEN LEASE	MAINTAIN	640	1,215	-	39	CATTLE	03/01	02/28	35	164
01232	CHAPMAN	MAINTAIN	2,256	1,629	-	51	CATTLE	03/01	05/03	100	107
01234	DAVIDSON	CUSTODIAL	320	640	-	20	CATTLE	03/01	02/28	100	90
01235	DEVLIN AMP	MAINTAIN	10,955	5,003	1,280	247	CATTLE	03/01	02/28	53	1571
01238	N-N ALLOTMENT	CUSTODIAL	320	19,520	-	8	CATTLE	03/01	02/28	100	89
01239	DORAN	MAINTAIN	560	2,565	-	13	CATTLE	03/01	02/28	100	152
01240	DUKART	CUSTODIAL	160	320	160	4	CATTLE	03/01	02/28	100	46
01241	EATON BUTTE	MAINTAIN	925	2,880	640	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
01242	GACKLE	CUSTODIAL	960	2,526	-	1	CATTLE	07/16	07/16	100	1
01243	MATHERS	MAINTAIN	1,046	8,248	-	26	CATTLE	03/01	02/28	100	313
01244	GRUE	MAINTAIN	6,343	10,266	1,646	15	HORSE	03/01	02/28	35	63
01245	HASTETTER - PRAIRIE	CUSTODIAL	360	1,614	-	7	CATTLE	03/01	02/28	100	89
01252	CROW ROCK/PRAIRIE CO	MAINTAIN	6,064	1,591	960	134	CATTLE	03/01	02/28	100	1603
01255	CLARENCE UNIT	MAINTAIN	962	3,932	640	21	CATTLE	03/01	02/20	100	246
01258	LANGEMO	CUSTODIAL	317	5,072	-	16	CATTLE	05/01	10/30	100	96
01259	TULARSKI UNIT	CUSTODIAL	320	2,285	-	8	CATTLE	03/01	02/28	100	96

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
01261	MACIOROSKI	CUSTODIAL	320	1,235	-	7	CATTLE	03/01	02/28	100	84
01264	WOHLGENANT LEASE	CUSTODIAL	120	1,002	157	9	CATTLE	03/01	02/28	100	29
01265	DENBY LEASE	MAINTAIN	1,421	770	-	110	CATTLE	09/07	11/11	61	146
01266	MOORE, CHARLES	MAINTAIN	2,961	1,402	-	150	CATTLE	03/15	11/17	69	844
01267	KOUNTZ	CUSTODIAL	281	4,920	-	13	CATTLE	05/01	11/13	100	84
01270	PFAFF AMP	MAINTAIN	6,957	13,279	1,360	154	CATTLE	03/01	02/28	100	1845
01271	REDWATER UNIT	CUSTODIAL	539	3,156	-	24	CATTLE	05/10	11/08	100	144
01272	REILLY HOME PLACE	MAINTAIN	965	64,172	640	21	CATTLE	03/01	02/28	100	249
01280	SIR	CUSTODIAL	320	2,016	2,586	7	CATTLE	03/01	02/28	100	90
01281	SMALIS	CUSTODIAL	320	2,571	-	12	CATTLE	05/10	12/01	100	81
01282	STICKEL AMP	IMPROVE	3,640	1,311	-	2	YRLING CATTLE	05/01	06/30	79	3
01283	GREASEWOOD	MAINTAIN	1,598	3,830	-	30	CATTLE	03/01	02/28	100	366
01284	TIBBETTS AMP	MAINTAIN	2,370	6,297	-	5	HORSE	03/01	02/28	50	30
01287	LISK CREEK UNIT	IMPROVE	2,266	2,842	-	141	CATTLE	05/15	09/27	100	630
01290	YOUNGQUIST	CUSTODIAL	160	1,120	-	4	CATTLE	03/01	02/28	100	46
01291	EATON NORTH UNIT	MAINTAIN	320	1,600	-	8	CATTLE	03/01	02/18	100	93
01292	LITTLE SHEEP MOUNTAIN	MAINTAIN	2,241	1,921	961	38	CATTLE	03/01	02/27	100	455
01294	KETCHUM ALLOTMENT	MAINTAIN	350	2,896	-	9	CATTLE	03/01	02/28	100	102
01295	DUKART-WIBAUX	CUSTODIAL	122	2,461	-	3	CATTLE	03/01	02/28	100	34
01296	BOB'S LEASE	CUSTODIAL	80	13,750	1,598	2	CATTLE	03/01	02/28	100	14
01298	PEILA	MAINTAIN	7,875	22,513	3,210	1	CATTLE	04/01	07/20	28	1
01308	HJORTH UNIT	CUSTODIAL	335	756	-	6	CATTLE	03/01	02/28	100	79
01311	ENGLEBRIGHT	CUSTODIAL	148	171	-	25	CATTLE	12/01	02/28	100	74
01315	ALVIN UNIT	CUSTODIAL	551	1,479	371	19	CATTLE	05/01	11/30	100	134
01316	A. PINNOW	MAINTAIN	1,920	3,640	640	1	CATTLE	03/01	02/28	100	12
01317	GAUB LEASE	MAINTAIN	3,595	2,643	-	2	CATTLE	05/15	06/15	100	2
01318	GAUB	CUSTODIAL	298	1,058	640	43	CATTLE	05/20	10/19	33	71
01322	ASH CREEK	CUSTODIAL	320	1,582	-	7	CATTLE	03/01	02/28	100	84

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
01324	HOFFER	MAINTAIN	774	320	-	55	CATTLE	07/01	11/01	100	224
01325	HYDE PLACE	CUSTODIAL	1,730	640	665	100	CATTLE	04/15	11/19	60	432
01326	DOROTHY DRAW AMP	MAINTAIN	3,282	960	-	1	CATTLE	12/23	01/31	100	1
01329	DEER CREEK AMP	MAINTAIN	4,207	2,116	-	1	CATTLE	03/01	02/28	100	9
01334	BRANDENTHALER	MAINTAIN	40	1,560	-	1	CATTLE	03/01	02/28	100	7
01338	FOX CREEK	MAINTAIN	1,440	640	-	63	CATTLE	05/01	12/01	74	330
01339	ADOLPH'S PLACE	MAINTAIN	2,327	2,444	640	1	CATTLE	06/01	07/01	100	1
01344	PRAIRIE COUNTY	IMPROVE	2,161	1,261	-	96	CATTLE	06/01	11/11	65	336
01351	W PAST 3, INDIVIDUAL	MAINTAIN	640	2,565	-	50	CATTLE	06/01	10/31	50	126
01356	WINDMILL AMP	MAINTAIN	5,483	320	-	94	CATTLE	05/15	02/02	100	816
01358	SCHOTT LEASE	CUSTODIAL	40	741	-	1	CATTLE	03/01	02/28	100	11
01362	TBS ALLOTMENT	MAINTAIN	2,736	1,645	800	228	CATTLE	04/10	07/14	100	720
01364	TUSLER	MAINTAIN	1,857	1,761	160	2	CATTLE	03/01	02/28	100	24
01368	WEST UNIT	CUSTODIAL	40	480	-	1	CATTLE	03/01	02/28	100	7
01370	SOUTHWEST	CUSTODIAL	748	2,486	-	11	CATTLE	03/01	02/28	100	132
01371	PEHRSON	CUSTODIAL	29	374	-	2	CATTLE	05/01	10/31	100	3
01372	BOUCHARD	CUSTODIAL	48	504	-	1	CATTLE	03/01	02/28	100	4
01373	BEERY LEASE	CUSTODIAL	80	561	-	2	CATTLE	03/01	02/28	100	24
01374	BRENNER	CUSTODIAL	80	73	-	2	CATTLE	03/01	02/28	100	20
01375	BRODY	CUSTODIAL	40	8,886	640	1	CATTLE	03/01	02/28	100	10
01376	BURMAN, DOROTHY	CUSTODIAL	320	2,560	-	12	CATTLE	05/01	10/25	100	70
01377	CARPENTER	CUSTODIAL	160	3,040	-	4	CATTLE	03/01	02/28	100	24
01378	CLAPP	MAINTAIN	960	1,797	-	32	CATTLE	05/01	10/30	100	193
01379	BLUE MOUNTAIN	CUSTODIAL	640	3,200	-	18	CATTLE	05/01	10/30	100	108
01380	SAWYER'S ISLAND	CUSTODIAL	36	68	-	2	CATTLE	03/01	02/28	100	18
01382	DAWSON COUNTY	CUSTODIAL	360	2,884	-	14	CATTLE	05/01	10/28	100	83
01383	BEERY	CUSTODIAL	80	960	-	1	CATTLE	03/01	02/28	100	14
01384	DIEGEL	CUSTODIAL	80	720	-	2	CATTLE	03/01	02/28	100	20

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01385	ENGLE	CUSTODIAL	40	1,433	646	2	CATTLE	03/01	02/28	100	30
01387	PIRRIE	CUSTODIAL	640	6,400	-	19	CATTLE	03/01	02/28	100	115
01388	GENTRY	CUSTODIAL	101	4,428	-	2	CATTLE	03/01	02/28	100	20
01389	LANGE	CUSTODIAL	320	7,228	63	6	CATTLE	03/01	02/28	100	74
01390	L. H. UNIT	CUSTODIAL	205	3,189	-	2	CATTLE	03/01	02/28	100	34
01391	GIBSON	CUSTODIAL	320	2,969	-	5	CATTLE	03/01	02/28	100	33
01393	GREIMAN	CUSTODIAL	280	1,600	-	4	CATTLE	03/01	02/28	100	48
01394	FREDA	CUSTODIAL	120	1,058	-	4	CATTLE	05/01	10/31	100	26
01395	HEIDE	CUSTODIAL	40	480	-	2	CATTLE	03/01	02/28	100	11
01396	RINGLING #2	CUSTODIAL	80	4,444	-	1	CATTLE	03/01	02/28	100	16
01397	HERIGSTAD RANCH	MAINTAIN	960	1,002	-	106	CATTLE	06/01	09/15	49	183
01398	HESS ALLOTMENT	CUSTODIAL	320	880	-	7	CATTLE	03/01	02/28	100	87
01400	HILLIARD	MAINTAIN	640	6,393	-	9	CATTLE	03/01	02/28	100	106
01402	HUTCHINSON	CUSTODIAL	320	960	-	5	CATTLE	03/01	02/28	100	56
01403	HASTETTER - DAWSON	CUSTODIAL	320	3,280	-	5	CATTLE	03/01	02/28	100	57
01405	LARS UNIT	MAINTAIN	720	6,241	-	8	CATTLE	03/01	02/28	100	87
01406	KIRKEGARD UNIT	CUSTODIAL	71	550	-	1	CATTLE	03/01	02/28	100	13
01407	KREIMAN	CUSTODIAL	200	1,297	-	6	CATTLE	03/01	02/28	100	40
01408	JORDIS PLACE	CUSTODIAL	720	2,959	640	13	CATTLE	03/01	02/28	100	161
01409	MAHLSTEDT	CUSTODIAL	40	6,499	-	2	CATTLE	03/01	02/28	100	10
01410	JENSEN	CUSTODIAL	117	313	-	2	CATTLE	03/01	02/28	100	27
01411	MEYER	CUSTODIAL	157	959	-	30	CATTLE	03/01	02/28	100	32
01412	MULLENDORE	MAINTAIN	1,200	8,605	640	21	CATTLE	03/01	02/28	100	243
01413	WEYERBACHER	CUSTODIAL	193	309	-	3	CATTLE	03/01	02/28	100	36
01416	ROBERT E. NEWTON	MAINTAIN	1,037	11,631	320	16	CATTLE	03/01	02/28	100	192
01417	PISK	CUSTODIAL	80	1,840	-	2	CATTLE	03/01	02/28	100	24
01418	WILSON	CUSTODIAL	39	847	-	1	CATTLE	03/01	02/28	100	12
01419	RAHR	MAINTAIN	761	1,182	-	8	CATTLE	03/01	02/28	100	94

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
01420	TRYQUE REE	CUSTODIAL	133	2,744	640	3	CATTLE	03/01	02/28	100	30
01423	HANCOCK PLACE	CUSTODIAL	241	2,222	-	5	CATTLE	03/01	02/28	100	60
01424	WOLFF INDIVIDUAL	MAINTAIN	1,586	2,376	-	44	CATTLE	03/01	02/28	100	534
01425	SCHIPMAN	CUSTODIAL	480	77	-	15	CATTLE	03/01	02/28	100	89
01426	SELMAN	CUSTODIAL	365	4,779	1,046	4	CATTLE	03/01	02/28	100	48
01427	7 C - DAWSON COUNTY	MAINTAIN	2,443	4,757	1,280	54	CATTLE	03/01	02/28	100	648
01429	STORTZ	CUSTODIAL	200	7,799	1,280	4	CATTLE	03/01	02/28	100	48
01430	SUTTON UNIT	CUSTODIAL	200	1,469	-	5	CATTLE	03/01	02/28	100	63
01431	MITCHELL	MAINTAIN	1,356	6,358	-	15	CATTLE	03/01	02/28	100	177
01432	GUDRUN'S PLACE	CUSTODIAL	320	4,800	-	6	CATTLE	03/01	02/28	100	76
01433	WESTERN GRAVEL	CUSTODIAL	160	2,853	831	3	CATTLE	03/01	02/28	100	36
01434	WILLIAMS	MAINTAIN	2,075	4,160	640	35	CATTLE	03/01	02/28	100	416
01435	WOLFF & SONS	CUSTODIAL	80	1,200	-	2	CATTLE	03/01	02/28	100	24
01437	TWEDT	CUSTODIAL	37	3,856	-	1	CATTLE	03/01	02/28	100	10
01441	CALDWELL	CUSTODIAL	993	1,127	-	20	CATTLE	05/01	10/31	100	121
01442	DEEP COULEE	CUSTODIAL	477	2,705	-	8	CATTLE	03/01	02/28	100	100
01443	BALDWIN	CUSTODIAL	160	4,560	-	2	CATTLE	03/01	02/28	100	29
01444	BARNABY CATTLE CO.	CUSTODIAL	320	320	-	8	CATTLE	03/01	02/28	100	92
01445	BAXTER	CUSTODIAL	360	2,840	320	10	CATTLE	03/01	02/28	100	122
01446	AMUNRUD - BN LEASE	CUSTODIAL	120	3,974	-	3	CATTLE	03/01	02/28	100	30
01447	BIDEGARAY	MAINTAIN	1,861	5,181	-	26	CATTLE	03/01	02/28	100	312
01450	JESS J BLANKENSHIP	MAINTAIN	7,266	12,478	640	1	CATTLE	03/01	02/28	100	8
01451	KITTLESON	CUSTODIAL	80	7,629	-	2	CATTLE	03/01	02/28	100	28
01452	BORG ALLOTMENT	CUSTODIAL	299	1,162	-	2	CATTLE	03/01	02/28	100	25
01454	BROWN, HAROLD	MAINTAIN	320	1,280	-	7	CATTLE	03/01	02/28	100	92
01455	BUXBAUM	CUSTODIAL	160	2,400	-	3	CATTLE	03/01	02/28	100	30
01456	LORENZ	CUSTODIAL	80	2,796	320	4	CATTLE	03/01	02/28	100	26
01457	CANDEE	CUSTODIAL	160	800	-	4	CATTLE	03/01	02/28	100	50

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01458	CARLISLE	CUSTODIAL	244	1,140	40	14	CATTLE	03/01	02/28	100	82
01459	САҮКО	CUSTODIAL	80	960	-	10	SHEEP	03/01	02/28	100	23
01461	COLGAN	MAINTAIN	359	5,029	-	8	CATTLE	03/01	02/28	100	97
01462	BERTHA UNIT	CUSTODIAL	160	2,237	-	5	CATTLE	03/01	02/28	100	59
01463	DAYTON	CUSTODIAL	200	1,319	-	6	CATTLE	03/01	02/28	100	68
01464	REE	CUSTODIAL	397	5,755	-	9	CATTLE	03/01	02/28	100	114
01465	HARDSCRABBLE CREEK	MAINTAIN	787	5,919	320	18	CATTLE	03/01	02/28	100	219
01466	DOHRMAN	CUSTODIAL	120	4,040	640	4	CATTLE	03/01	02/28	100	24
01467	PETERMANN	CUSTODIAL	320	960	-	5	CATTLE	03/01	02/28	100	64
01468	FISHER	CUSTODIAL	400	2,854	-	11	CATTLE	03/01	02/28	100	134
01469	OAKS PLACE	CUSTODIAL	160	606	-	5	CATTLE	03/01	02/28	100	53
01470	DUGOUT CREEK UNIT	MAINTAIN	569	4,297	640	13	CATTLE	03/01	02/28	100	156
01471	K & J UNIT	MAINTAIN	323	4,768	-	6	CATTLE	03/01	02/28	100	69
01472	SHACK CREEK ALLOTMENT	MAINTAIN	309	3,049	-	5	CATTLE	03/01	02/28	100	55
01473	FRANZEN	CUSTODIAL	697	1,627	-	11	CATTLE	03/01	02/28	100	139
01474	STATELINE	CUSTODIAL	375	506	-	12	CATTLE	05/01	11/06	100	75
01476	GUSTAFSON	CUSTODIAL	120	2,824	81	2	CATTLE	03/01	02/28	100	24
01477	HACKLEY	MAINTAIN	415	35	-	13	CATTLE	05/01	10/31	100	79
01478	HAGAN UNIT	CUSTODIAL	80	2,035	-	4	CATTLE	05/01	10/31	100	20
01480	ARTHUR UNIT	CUSTODIAL	320	4,600	522	4	CATTLE	03/01	02/28	100	50
01481	HARMON, DEAN	MAINTAIN	559	1,120	-	14	CATTLE	03/01	02/28	100	167
01483	HASTETTER - RICHLAND	MAINTAIN	1,633	7,615	640	24	CATTLE	03/01	02/28	100	288
01484	HERIGSTAD	MAINTAIN	4,590	9,113	640	12	CATTLE	05/01	10/21	100	69
01485	CLYDE UNIT	MAINTAIN	1,845	2,545	-	23	CATTLE	03/01	02/28	100	283
01487	C. L. UNIT	CUSTODIAL	420	7,599	640	10	CATTLE	03/01	02/28	100	122
01488	IVERSEN	CUSTODIAL	200	1,864	-	5	CATTLE	03/01	02/28	100	62
01490	RAAUM BROTHERS	CUSTODIAL	80	600	-	2	CATTLE	03/01	02/28	100	22
01491	VOURNOS	CUSTODIAL	26	1,918	-	1	CATTLE	04/15	11/15	100	7

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01492	JOHNSTON	CUSTODIAL	40	320	-	1	CATTLE	03/01	02/28	100	8
01493	WIBAUX	MAINTAIN	1,800	6,228	-	26	CATTLE	03/01	02/28	100	317
01496	LAWSON PLACE	MAINTAIN	750	1,800	-	15	CATTLE	03/01	02/28	100	188
01497	RALSTON	MAINTAIN	1,959	5,156	-	1	CATTLE	03/01	02/28	100	11
01500	MCGINNIS	MAINTAIN	2,670	2,080	-	63	CATTLE	03/01	02/28	100	752
01502	MERCER	CUSTODIAL	229	3,549	640	12	CATTLE	05/01	10/25	100	70
01503	MICHELETTO	CUSTODIAL	26	72	-	2	CATTLE	03/01	02/28	100	13
01504	HENRY A MILLER, JR	MAINTAIN	992	1,793	-	49	CATTLE	05/01	11/04	100	303
01505	CHARLEY CREEK	MAINTAIN	280	2,430	1,360	10	CATTLE	03/01	02/28	100	116
01506	ROAD UNIT	CUSTODIAL	680	4,465	-	16	CATTLE	03/01	02/28	100	195
01507	HARDY	CUSTODIAL	153	3,559	600	6	CATTLE	03/01	02/28	100	64
01508	VIRGIL F MOLINE	CUSTODIAL	320	803	-	5	CATTLE	05/01	11/08	100	32
01509	LANE	CUSTODIAL	269	295	-	3	CATTLE	03/01	02/28	100	44
01511	LOWMAN	CUSTODIAL	40	200	-	1	CATTLE	03/01	02/28	100	12
01512	NELSON LIVESTOCK	CUSTODIAL	479	2,719	-	7	CATTLE	03/01	02/28	100	84
01515	PALMER	MAINTAIN	683	1,987	-	30	CATTLE	05/01	11/03	100	184
01516	PARSONS	CUSTODIAL	480	3,190	-	11	CATTLE	03/01	02/28	100	137
01519	VERSCHOOT	CUSTODIAL	320	1,600	-	6	CATTLE	03/01	02/28	100	77
01520	ERNEST UNIT	CUSTODIAL	161	3,564	-	3	CATTLE	03/01	02/28	100	41
01521	RASMUSSEN	CUSTODIAL	120	2,121	-	2	CATTLE	03/01	02/28	100	30
01522	RENZ	MAINTAIN	1,308	2,093	-	29	CATTLE	05/01	11/28	100	202
01523	RITTER UNIT	MAINTAIN	644	2,882	-	17	CATTLE	03/01	02/28	100	214
01524	DRY CREEK	MAINTAIN	779	5,020	958	14	CATTLE	03/01	02/28	100	173
01526	PETE'S PLACE	CUSTODIAL	120	1,747	-	3	CATTLE	03/01	01/01	100	35
01527	RUFFATTO	CUSTODIAL	40	2,920	-	1	CATTLE	03/01	02/28	100	11
01529	SCHEETZ	CUSTODIAL	132	2,500	-	3	CATTLE	03/01	02/28	100	42
01530	SCHIEFFER, ANTHONY	CUSTODIAL	80	6,278	-	2	CATTLE	03/01	02/28	100	23
01531	TERRY'S PLACE	CUSTODIAL	495	2,108	-	10	CATTLE	03/01	02/28	100	122

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01532	SCHMITZ TRUST	CUSTODIAL	320	1,771	-	8	CATTLE	03/01	02/28	100	92
01533	SCHMITZ, RAYMOND	CUSTODIAL	400	7,151	-	11	CATTLE	03/01	02/28	100	133
01534	7 C - WIBAUX COUNTY	MAINTAIN	960	7,650	640	13	CATTLE	03/01	02/28	100	160
01535	SHERMAN	CUSTODIAL	560	296	320	13	CATTLE	05/01	11/03	100	80
01536	SHERMAN ESTATE	CUSTODIAL	40	720	-	1	CATTLE	03/01	02/28	100	10
01537	LODGE POLE	CUSTODIAL	160	1,845	-	4	CATTLE	03/01	02/28	100	43
01538	J&R	CUSTODIAL	40	713	-	1	CATTLE	03/01	02/28	100	4
01539	SIMONSON	CUSTODIAL	40	1,120	-	1	CATTLE	03/01	02/28	100	16
01540	SKAAR	CUSTODIAL	189	5,737	640	9	CATTLE	03/01	02/28	100	54
01541	SMART	CUSTODIAL	160	425	-	6	CATTLE	05/01	10/31	100	40
01543	SOWLE, CLIFTON	CUSTODIAL	480	1,560	-	11	CATTLE	03/01	02/28	100	132
01544	SOWLE, CLIFTON	MAINTAIN	600	2,110	1,699	13	CATTLE	03/01	02/28	100	152
01545	TOBIN/SMITH UNIT	MAINTAIN	2,985	25,431	1,280	52	CATTLE	03/01	02/28	100	629
01546	BLACKJACK	CUSTODIAL	940	1,150	-	31	CATTLE	05/01	01/29	100	279
01547	UNALLOCATED - SORENSON	CUSTODIAL	83	960	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
01549	TRUDELL	MAINTAIN	1,280	1,131	-	44	CATTLE	05/15	09/30	100	201
01550	VAIRA	CUSTODIAL	80	549	-	2	CATTLE	03/01	02/28	100	20
01552	VEEBARAY CO	CUSTODIAL	118	13,948	1,920	4	CATTLE	03/01	02/28	100	26
01553	VITT W J	CUSTODIAL	120	1,603	-	3	CATTLE	03/01	02/28	100	35
01558	OTIS CREEK	CUSTODIAL	40	1,160	-	1	CATTLE	03/01	02/28	100	10
01560	WYMAN	CUSTODIAL	160	1,280	-	7	CATTLE	03/01	02/28	100	40
01561	TVEIT	CUSTODIAL	40	4,148	-	1	CATTLE	03/01	02/28	100	14
01562	THRAMS	MAINTAIN	160	2,875	640	3	CATTLE	03/01	02/28	100	37
01563	SETEREN LEASE/SEC 15	CUSTODIAL	40	1,719	-	1	CATTLE	03/01	02/28	100	14
01564	BURGESS UNALLOCATED 26N59E15	CUSTODIAL	22	1,340	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
01565	NOHLY	CUSTODIAL	40	600	-	1	CATTLE	03/01	02/28	100	15
01566	THOMPSON	CUSTODIAL	40	1,800	-	1	CATTLE	03/01	02/28	100	12
01567	W. BUXBAUM	CUSTODIAL	40	2,456	-	2	CATTLE	03/01	02/28	100	14

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01568	DYNNESON	CUSTODIAL	40	3,600	-	1	CATTLE	03/01	02/28	100	13
01569	PREVOST	CUSTODIAL	40	1,400	-	1	CATTLE	03/01	02/28	100	13
01570	MAROTTEK	CUSTODIAL	37	80	-	1	CATTLE	03/01	02/28	100	6
01571	OSBORNE	CUSTODIAL	60	164	-	1	CATTLE	03/01	02/28	100	11
01572	WATERS INC.	CUSTODIAL	76	3,760	-	2	CATTLE	03/01	02/28	100	11
01573	WINHOFER	MAINTAIN	839	680	-	29	CATTLE	07/15	11/14	100	117
01574	LESTER INDIVIDUAL	CUSTODIAL	40	251	-	1	CATTLE	03/01	02/28	100	9
01580	BUTTE CREEK	CUSTODIAL	80	840	520	2	CATTLE	03/01	02/28	100	14
01588	BRUNER/WAY EAST	CUSTODIAL	1,282	1,114	-	129	CATTLE	06/01	10/05	64	255
01590	TC RIVER UNIT	CUSTODIAL	40	554	-	1	CATTLE	03/01	02/28	100	6
01592	SOUTH SIELER	MAINTAIN	320	1,920	.7	45	CATTLE	06/01	09/13	49	76
01594	HOUSE CREEK	CUSTODIAL	400	1,671	-	9	CATTLE	03/01	02/28	100	81
01595	MIZPAH	CUSTODIAL	106	639	-	6	CATTLE	03/01	02/28	100	23
01599	SHAWVER	CUSTODIAL	160	2,080	-	3	CATTLE	03/01	02/28	100	36
01603	E.A. UNIT	CUSTODIAL	80	4,604	-	2	CATTLE	03/01	02/28	100	21
01609	ALBION	CUSTODIAL	141	3,016	-	2	CATTLE	03/01	02/28	100	24
01611	LOUIE AND SCOTTIE	CUSTODIAL	3,506	9,428	2084	209	CATTLE	04/01	11/30	31	520
01619	BUTTERMILK CREEK	MAINTAIN	2,691	1,142	-	254	CATTLE/SHEEP	04/15	11/30	36	699
01624	ZUROFF - DAWSON	CUSTODIAL	40	3,160	320	2	CATTLE	03/01	02/28	100	11
01628	AMUNRUD	CUSTODIAL	40	1,901	-	1	CATTLE	03/01	02/28	100	11
01629	SCHLENZ	CUSTODIAL	80	2,320	-	1	CATTLE	03/01	02/28	100	11
01630	LUND	CUSTODIAL	40	7,000	-	1	CATTLE	03/01	02/28	100	14
01634	MCDONALD	CUSTODIAL	320	3,496	1,272	11	CATTLE	03/01	02/28	100	135
01635	SCHWEIGERT SOUTH	MAINTAIN	320	320	-	5	CATTLE	03/01	02/28	100	64
01638	THORNE PLACE	CUSTODIAL	600	1,119	1,119	10	CATTLE	03/01	02/28	100	142
01640	CEDAR CREEK ALLOTMENT	CUSTODIAL	362	3,795	39	10	CATTLE	03/01	02/28	100	106
01641	FOSS/TAYLOR LEASE	CUSTODIAL	40	565	-	1	CATTLE	03/01	02/28	100	11

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01642	DEVILS ELBOW UNIT	CUSTODIAL	924	1,763	480	16	CATTLE	03/01	02/28	100	246
01643	BUTTE CREEK ROAD	MAINTAIN	3,360	6,680	640	63	CATTLE	03/01	02/28	100	758
01648	BEESLEY HOME PLACE	CUSTODIAL	340	1,264	-	5	CATTLE	03/01	02/28	100	61
01649	ELDON MOUNTAIN	CUSTODIAL	140	1,219	-	3	CATTLE	03/01	02/28	100	33
01650	GOTLEPS	CUSTODIAL	320	2,560	640	6	CATTLE/SHEEP	03/01	02/28	100	49
01654	PEASE DRAW	CUSTODIAL	561			8	CATTLE	03/01	02/28	100	104
01657	SOUTH PASTURE	MAINTAIN	2,730	4,797	-	73	CATTLE	05/01	01/29	100	658
01659	HALFWAY	CUSTODIAL	220	320		4	CATTLE	03/01	02/28	100	220
01668	ROSAAEN	CUSTODIAL	200	1,802	319	2	CATTLE	05/01	10/31	100	12
01676	BRADAC-SONSALLA UNIT	IMPROVE	1,380	1,477	-	2	CATTLE	05/16	10/10	54	470
01682	ALLOTMENT A COMMON	MAINTAIN	1,772	354	-	70	CATTLE	04/25	10/15	90	360
01683	BEECHER	CUSTODIAL	120	16,884	640	2	CATTLE	03/01	02/28	100	27
01685	STEPPLER ALLOTMENT	CUSTODIAL	724	8,817	-	16	CATTLE	03/01	02/28	100	195
01687	BADGER CREEK	MAINTAIN	720	12,718	640	14	CATTLE	03/01	02/28	100	173
01690	FITZGERALD	CUSTODIAL	80	1,763	-	2	CATTLE	03/01	02/28	100	20
01694	STANDISH ALLOTMENT	CUSTODIAL	320	6,382	-	4	CATTLE	03/01	02/28	100	55
01697	HEIFER PASTURE	CUSTODIAL	395	1,942	-	13	CATTLE	03/01	02/28	100	115
01700	TRACT ONE	MAINTAIN	1,040	4,218	640	27	CATTLE	04/01	11/27	100	214
01802	FLAT BOTTOM	CUSTODIAL	320	52,915	3,200	3	CATTLE	03/01	02/28	100	30
01804	CULLMAN	CUSTODIAL	155	1,461	-	4	CATTLE	03/01	02/28	100	51
01805	FRAZIER CREEK	CUSTODIAL	120	1,779	-	4	CATTLE	03/01	02/28	100	44
01808	HUNGRY CREEK	CUSTODIAL	1,489	1,234	-	112	CATTLE	05/01	10/15	43	266
03084	T-N DIVIDE	CUSTODIAL	4,842	3,724	1,330	3	CATTLE	03/01	02/28	100	33
03085	CS CREEK	CUSTODIAL	43	4,541	-	1	CATTLE	03/01	02/28	100	15
03087	KENNEDY CREEK	CUSTODIAL	1,560	6,713	-	17	CATTLE	03/01	02/28	100	213
03088	N BIERY	MAINTAIN	3,825	11,330	1,280	5	CATTLE	03/01	02/28	100	54
03092	RED BANK CREEK	CUSTODIAL	40	2,600	-	1	CATTLE	03/01	02/28	100	9
03108	REX	CUSTODIAL	80	880	-	2	CATTLE	03/01	02/28	100	20

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
03111	SOUTH BANK	CUSTODIAL	37	475	-	2	CATTLE	03/01	02/28	100	23
03116	SECOND CREEK	CUSTODIAL	80	1,120	-	1	CATTLE	03/01	02/28	100	17
03117	LONESOME PEAK	CUSTODIAL	390	3,322	-	8	CATTLE	03/01	02/28	100	100
03141	LOWER PINE CREEK	CUSTODIAL	320	960	-	4	CATTLE	03/01	02/28	100	56
03151	UNION CREEK	CUSTODIAL	440	1,476	640	9	CATTLE	03/01	02/28	100	107
03152	DIEBEL	CUSTODIAL	40	1,640	-	1	CATTLE	03/01	02/28	100	13
03164	PINE NEEDLE	CUSTODIAL	40	280	-	1	CATTLE	03/01	02/28	100	10
03169	WYO ALLOTMENT	CUSTODIAL	570	1,282	-	14	CATTLE	03/01	02/28	100	170
03185	ELM COULEE	CUSTODIAL	939	4,792	640	17	CATTLE	03/01	02/28	100	206
03193	FLOOD CREEK	CUSTODIAL	300	1,520	-	4	CATTLE	03/01	02/28	100	59
03194	DAY CREEK EAST	CUSTODIAL	645	2,817	522	10	CATTLE	03/01	02/28	100	124
03196	SOUTH PASTURE LEASE	CUSTODIAL	906	960	-	68	CATTLE	05/01	08/25	57	149
03214	WEST FORK	CUSTODIAL	40	640	-	1	CATTLE	03/01	02/28	100	8
03223	BEARDSLEY ALLOTMENT	CUSTODIAL	640	5,401	640	11	CATTLE	03/01	02/28	100	127
03229	MULLER WEST	CUSTODIAL	66	1,387	-	1	CATTLE	03/01	02/28	100	12
03231	CLAY PIT	CUSTODIAL	80	300	-	1	CATTLE	03/01	02/28	100	14
03235	NORTH SANTA FE	CUSTODIAL	160	240	-	3	CATTLE	03/01	02/28	100	38
03236	FITZGERALD	CUSTODIAL	73	525	-	1	CATTLE	03/01	02/28	100	18
03249	PK PASTURE	CUSTODIAL	120	2,446	-	2	CATTLE	03/01	02/28	100	25
03263	CLIFF ALLOTMENT	CUSTODIAL	40	156	-	1	CATTLE	03/01	02/28	100	8
03266	SOUTH	CUSTODIAL	232	6,616	640	8	CATTLE	03/01	02/28	100	98
03267	FLAT CREEK	CUSTODIAL	1,600	1,971	-	98	CATTLE	06/15	09/15	100	300
03281	SANDON	CUSTODIAL	1,775	3,130	-	37	CATTLE	03/01	02/28	100	443
03284	JOHNSON UNIT	CUSTODIAL	246	3,701	640	5	CATTLE	03/01	02/28	100	61
03291	DELP	CUSTODIAL	320	960	-	7	CATTLE	03/01	02/28	100	80
03300	UPPER CROW CREEK	CUSTODIAL	1,151	1,089	-	4	CATTLE	03/01	02/28	100	42
03303	FBC	CUSTODIAL	40	160	-	1	CATTLE	03/01	02/28	100	10
03304	KIRSCHTEN-EAST	CUSTODIAL	320	880	640	24	CATTLE	06/01	10/02	100	98

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03327	BETZ CREEK ALLOTMENT	CUSTODIAL	370	3,286	-	3	CATTLE	03/01	02/28	100	44
03328	RANCH CREEK ALLOTMENT	CUSTODIAL	320	10,731	800	4	CATTLE	03/01	02/28	100	57
03346	LITTLE BREED CREEK	CUSTODIAL	47	7,713	320	1	CATTLE	03/01	02/28	100	11
03349	MATT CREEK	MAINTAIN	1,454	841	-	59	CATTLE	03/01	04/27	57	64
03360	SOUTH DRAINE	CUSTODIAL	120	2,940	640	3	CATTLE	03/01	02/28	100	34
03374	GRIMES CREEK	MAINTAIN	565	14,768	640	12	CATTLE	03/01	02/28	100	140
03386	JOHN HEN CREEK	CUSTODIAL	160	9,581	-	1	CATTLE	03/01	02/28	100	27
03387	STRAUSS DIVIDE	IMPROVE	2,189	2,121	400	2	CATTLE	03/01	02/28	100	32
03391	SIBERIA	CUSTODIAL	347	1,026	-	54	CATTLE	05/01	10/16	34	102
03398	COW CREEK	CUSTODIAL	320	1,520	-	6	CATTLE	03/01	02/28	100	70
03399	HAY DRAW	IMPROVE	1,948	638	-	2	CATTLE	03/01	02/28	100	38
03401	BLACK HILL	MAINTAIN	1,216	487	-	48	CATTLE	04/01	11/01	69	234
03405	GLIDEWELL WEST	CUSTODIAL	80	1,402	640	2	CATTLE	03/01	02/28	100	18
03429	NORTH PASTURE	MAINTAIN	1,549	2,787	532	35	CATTLE	03/01	02/28	100	420
03430	DENVER PLACE	CUSTODIAL	189	800	-	3	CATTLE	03/01	02/28	100	36
03476	MUSTER	CUSTODIAL	-	-	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
05422	CASS UNIT	CUSTODIAL	218	13,729	760	7	CATTLE	03/01	02/28	100	82
05429	GEORGE & MARIE CRUM	MAINTAIN	656	3,964	-	18	CATTLE	03/01	02/28	100	219
05431	HENRY DECOCK	CUSTODIAL	104	9,706	1,587	2	CATTLE	03/01	02/28	100	21
05443	FARLEY UNIT	CUSTODIAL	361	8,564	-	12	CATTLE	03/01	02/28	100	138
05465	HAYS UNIT	CUSTODIAL	40	15,974	2,550	1	CATTLE	03/01	02/28	100	8
05527	J T REDDING	CUSTODIAL	53	1,744	-	2	CATTLE	03/01	02/28	100	18
10003	BADGETT	CUSTODIAL	550	1,477	-	7	CATTLE	03/01	02/28	100	90
10005	BAILEY	CUSTODIAL	308	4,428	640	5	CATTLE	03/01	02/28	100	62
10007	BATEY	CUSTODIAL	1,563	9,997	640	18	CATTLE	03/01	02/28	100	216
10008	GRAVEYARD CREEK	CUSTODIAL	1,619	5,961	-	1	CATTLE	06/01	09/01	100	3
10011	BROADUS, INC.	CUSTODIAL	626	7,118	640	8	CATTLE	03/01	02/28	100	101
10012	HOME CREEK	CUSTODIAL	295	2,539	-	2	CATTLE	03/01	02/28	100	17

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10015	ROSEBUD CREEK	CUSTODIAL	560	4,699	1,120	6	CATTLE	03/01	02/28	100	73
10016	TWELVE MILE CREEK	CUSTODIAL	2,482	7,959	640	28	CATTLE	03/01	02/28	100	347
10017	COATES UNIT	CUSTODIAL	360	4,657	640	7	CATTLE	03/01	02/28	100	85
10018	CONLEY	CUSTODIAL	40	361	3,941	1	CATTLE	03/01	02/28	100	7
10019	CORNWELL	CUSTODIAL	360	-	-	3	CATTLE	03/01	02/28	100	45
10020	BAILEY EGAN	MAINTAIN	201	-	-	4	CATTLE	03/01	02/28	100	50
10022	C X RANCH	CUSTODIAL	2,675	18,984	640	29	CATTLE	03/01	02/28	100	352
10025	FOUR L	IMPROVE	2,105	15,089	-	31	CATTLE	03/01	02/28	100	378
10029	EGAN RANCH	CUSTODIAL	1,720	14,054	-	32	CATTLE	03/01	02/28	100	382
10030	EGAN	CUSTODIAL	896	3,477	-	23	CATTLE	03/01	02/28	100	277
10031	ARMELLS UNIT	CUSTODIAL	40	13,981	-	1	CATTLE	03/01	02/28	100	8
10032	IRON JAW	CUSTODIAL	1,403	3,683	-	10	CATTLE	03/01	02/28	100	110
10033	SWEENEY CREEK	CUSTODIAL	320	4,780	-	3	CATTLE	03/01	02/28	100	30
10034	CARREL	CUSTODIAL	218	1,166	-	4	CATTLE	03/01	02/28	100	44
10035	POKER JIM	CUSTODIAL	214	2,473	-	1	CATTLE	03/01	02/28	100	15
10037	GENIE	CUSTODIAL	640	19,710	1,920	9	CATTLE	03/01	02/28	100	114
10039	GILLIN	CUSTODIAL	1,227	4,258	-	20	CATTLE	03/01	02/28	100	236
10040	GOLDER	CUSTODIAL	543	12,844	637	9	CATTLE	03/01	02/28	100	106
10044	HAMILTON	CUSTODIAL	28	4,002	-	1	CATTLE	03/01	02/28	100	5
10045	HARSTAD HOME PLACE	CUSTODIAL	313	3,826	-	3	CATTLE	03/01	02/28	100	39
10046	RASH	CUSTODIAL	320	2,240	-	6	CATTLE	03/01	02/28	100	76
10047	WELLS	CUSTODIAL	78	2,640	-	1	CATTLE	03/01	02/28	100	16
10048	HOSFORD	MAINTAIN	2,181	19,347	1,280	26	CATTLE	03/01	02/28	100	312
10049	BRINSKI UNIT	CUSTODIAL	630	22,554	1,920	8	CATTLE	03/01	02/28	100	93
10050	SEARCY-BALL UNIT	MAINTAIN	1,442	17,155	1,280	15	CATTLE	03/01	02/28	100	182
10051	JORDAN RANCHES	CUSTODIAL	80	7,951	-	1	CATTLE	03/01	02/28	100	12
10054	ODELL CREEK	MAINTAIN	1,203	4,329	-	1	HORSE	03/01	02/28	100	12
10055	LANGE UNIT	CUSTODIAL	283	1,654	-	1	HORSE	03/01	02/28	100	12

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10056	LARSEN	CUSTODIAL	650	5,791	640	5	CATTLE	03/01	02/28	100	59
10057	LEE	CUSTODIAL	560	9,729	640	9	CATTLE	03/01	02/28	100	103
10061	BRINGOFF CK. UNIT	CUSTODIAL	143	10,476	-	2	CATTLE	03/01	02/28	100	20
10063	MULLER PLACE	CUSTODIAL	160	960	-	3	CATTLE	03/01	02/28	100	38
10064	VISBORG	CUSTODIAL	200	3,362	572	4	CATTLE	03/01	02/28	100	43
10066	MONUMENT CREEK	MAINTAIN	1,499	10,505	-	21	CATTLE	03/01	02/28	100	252
10067	NANCE	CUSTODIAL	799	3,682	1,266	8	CATTLE	03/01	02/28	100	97
10068	NANSEL	CUSTODIAL	1,199	15,592	640	20	CATTLE	03/01	02/28	100	234
10070	ROCK CREEK	CUSTODIAL	32	275	-	1	CATTLE	03/01	02/28	100	4
10071	MONUMENT CREEK	CUSTODIAL	103	7,982	-	2	CATTLE	03/01	02/28	100	18
10076	BREWER	CUSTODIAL	18	195	-	2	CATTLE	03/01	02/28	100	31
10077	PETERSON	CUSTODIAL	346	2,566	640	4	CATTLE	03/01	02/28	100	51
10078	PHILBRICK	CUSTODIAL	432	16,344	640	6	CATTLE	03/01	02/28	100	78
10079	PIERCE	CUSTODIAL	170	1,006	-	3	CATTLE	03/01	02/28	100	32
10080	POLICH, ARTHUR	CUSTODIAL	687	12,537	1,280	9	CATTLE	03/01	02/28	100	95
10081	PORTER	CUSTODIAL	103	1,028	-	2	CATTLE	03/01	02/28	100	28
10082	PORTER	CUSTODIAL	811	6,269	640	19	CATTLE	03/01	02/28	100	232
10083	POWELL CATTLE	CUSTODIAL	240	4,477	640	5	CATTLE	03/01	02/28	100	56
10084	QUARTER CIRCLE U	MAINTAIN	7,229	22,535	1,968	84	CATTLE	03/01	02/28	100	1018
10087	ROCKER SIX	CUSTODIAL	195	18,854	640	4	CATTLE	03/01	02/28	100	47
10088	RUZICKA TWO	CUSTODIAL	40	1,019	-	1	CATTLE	03/01	02/28	100	5
10089	RUZICKA ONE	CUSTODIAL	446	1,594	-	6	CATTLE	03/01	02/28	100	81
10090	SCHREIBEIS	CUSTODIAL	381	2,780	-	6	CATTLE	03/01	02/28	100	66
10091	SCRUTCHFIELD	CUSTODIAL	1,110	5,117	-	6	CATTLE	03/01	02/28	100	79
10093	SMITH PLACE	MAINTAIN	1,125	104	-	30	CATTLE	05/15	11/15	100	185
10095	TANNER CK	CUSTODIAL	511	3,355	-	8	CATTLE	03/01	02/18	100	93
10098	NANSEL	CUSTODIAL	15	80	-	1	CATTLE	03/01	02/28	100	3
10100	TERRETT	CUSTODIAL	402	18,079	3,702	5	CATTLE	03/01	02/28	100	60

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10102	SPRING CREEK	MAINTAIN	1,467	5,059	-	109	CATTLE	04/01	12/01	23	202
10103	TRUSLER	CUSTODIAL	160	5,374	-	2	CATTLE	03/01	02/28	100	20
10105	VASSAU	MAINTAIN	6,096	44,781	2,790	81	CATTLE	03/01	02/28	100	976
10107	TRUSLER	CUSTODIAL	4	800	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
10108	WELCH	CUSTODIAL	43	314	-	1	CATTLE	03/01	02/28	100	12
10109	L. WILSON	CUSTODIAL	398	10,122	-	4	CATTLE	03/01	02/28	100	50
10113	FORKS	CUSTODIAL	3,067	418,881	4,705	57	CATTLE	03/01	02/28	100	695
10116	FINGER BUTTE RANCH	CUSTODIAL	534	1,720	635	6	CATTLE	03/01	02/28	100	83
10142	KENDRICK	CUSTODIAL	80	3,125	-	1	CATTLE	03/01	02/28	100	14
10150	TIDWELL DRAW	MAINTAIN	2,040	25,386	7,212	1	CATTLE	03/01	02/28	100	16
10152	SO INDIAN CR	IMPROVE	6,527	7,108	640	1	CATTLE	06/01	08/30	62	2
10153	ALLEN EAST	CUSTODIAL	1,300	17,752	1,280	20	CATTLE	03/01	02/28	100	241
10154	ALLEN	CUSTODIAL	154	4,738	-	4	CATTLE	03/01	02/28	100	42
10155	ALLISON	CUSTODIAL	100	646	-	2	CATTLE	03/01	02/28	100	20
10156	RUE PLACE	MAINTAIN	1,600	2,402	-	37	CATTLE	03/01	02/28	100	449
10158	ANDREWS	MAINTAIN	1,867	4,055	640	1	CATTLE	03/01	02/28	100	3
10159	NORTH BUTTE CREEK	IMPROVE	4,479	5,155	-	1	CATTLE	06/01	06/30	90	1
10161	ARLEDGE	CUSTODIAL	1,904	15,550	1,280	1	CATTLE	03/01	05/01	100	2
10162	THOMPSON CREEK	MAINTAIN	2,079	2,242	640	32	CATTLE	03/01	02/28	100	385
10163	AYE	CUSTODIAL	440	2,503	640	9	CATTLE	03/01	02/28	100	119
10164	JORDAN UNIT	MAINTAIN	6,752	18,707	3,025	124	CATTLE	03/01	02/28	100	1494
10168	LOT NUMBER TWELVE	CUSTODIAL	48	923	-	1	CATTLE	03/01	02/28	100	15
10169	WEST FORTY CREEK	MAINTAIN	2,610	7,131	1,274	50	CATTLE	03/01	02/28	100	604
10170	BARBERO	CUSTODIAL	80	2,892	-	2	CATTLE	03/01	02/28	100	27
10171	BASTIAN	CUSTODIAL	640	4,135	-	10	CATTLE	03/01	02/28	100	123
10172	TOMAN	MAINTAIN	1,527	3,596	640	32	CATTLE	03/01	02/28	100	388
10173	BEACH	CUSTODIAL	519	6,024	640	7	CATTLE	03/01	02/28	100	92
10174	BELTZ	CUSTODIAL	40	1,340	-	1	CATTLE	03/01	02/28	100	9

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10175	BERRY	IMPROVE	1,944	3,733	-	2	CATTLE	03/01	02/28	100	20
10176	DORSETT UNIT	CUSTODIAL	80	2,120	-	1	CATTLE	03/01	02/28	100	9
10178	BIRD	CUSTODIAL	80	1,200	-	1	CATTLE	03/01	02/28	100	14
10179	NINEMILE CREEK	CUSTODIAL	720	8,934	540	12	CATTLE	03/01	02/28	100	147
10180	BUFFALO CREEK	CUSTODIAL	365	1,140	-	6	CATTLE	03/01	02/28	100	73
10181	BLAIR	MAINTAIN	8,867	6,593	1,279	1	CATTLE	03/01	09/13	100	6
10182	BLAIR	CUSTODIAL	305	640	-	5	CATTLE	03/01	02/28	100	61
10183	MCKENZIE UNIT	MAINTAIN	2,881	5,234	1,564	5	HORSE	03/01	02/28	100	66
10184	BLUM	CUSTODIAL	495	2,995	-	4	CATTLE	03/01	02/28	100	50
10186	BROWNFIELD	MAINTAIN	6,251	7,024	640	1	CATTLE	03/01	02/28	100	5
10188	BORLA	CUSTODIAL	80	2,084	-	2	CATTLE	03/01	02/28	100	26
10189	HOME & SOMERS	MAINTAIN	5,225	5,021	640	17	CATTLE	03/01	05/15	100	43
10190	BROST	MAINTAIN	3,422	10,450	1,280	19	CATTLE	03/01	02/28	100	229
10191	BRUCE	CUSTODIAL	80	2,110	-	1	CATTLE	03/01	02/28	100	12
10192	BRUSKI	CUSTODIAL	131	1,560	-	3	CATTLE	03/01	02/28	100	35
10193	BUCK	MAINTAIN	2,040	8,080	-	15	CATTLE	03/01	02/28	100	180
10196	BURCH	CUSTODIAL	439	771	640	6	CATTLE	03/01	02/28	100	80
10198	BURLEY	CUSTODIAL	120	2,351	-	2	CATTLE	03/01	02/28	100	25
10199	BURLEY	MAINTAIN	1,040	3,717	-	22	CATTLE	03/01	02/28	100	272
10200	HOME PLACE	CUSTODIAL	160	2,348	-	3	CATTLE	03/01	02/28	100	40
10202	CADWELL	CUSTODIAL	164	3,039	826	1	CATTLE	03/01	02/28	100	21
10205	CAPRA	CUSTODIAL	113	1,652	640	15	SHEEP	03/01	02/28	100	36
10207	NORTH FORK	CUSTODIAL	200	680	-	4	CATTLE	03/01	02/28	100	50
10209	CARTER	CUSTODIAL	40	1,720	-	1	CATTLE	03/01	02/28	100	10
10211	CATHEY	CUSTODIAL	880	4,400	-	97	SHEEP	03/01	02/28	100	233
10212	MILLER CREEK	MAINTAIN	1,239	4,160	640	4	CATTLE	03/01	02/28	100	48
10214	CLARK	CUSTODIAL	160	9,595	560	4	CATTLE	03/01	02/28	100	50
10217	CORRAL CREEK	MAINTAIN	4,200	465	-	1	CATTLE	06/01	07/31	89	2

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
10218	CLEMENTS	CUSTODIAL	120	3,150	-	3	CATTLE	03/01	02/28	100	40
10220	DOLAN	MAINTAIN	6,338	8,294	4,245	16	INDIGENOUS	03/01	02/28	100	187
10221	SORENSON UNIT	MAINTAIN	3,330	8,729	2,540	48	CATTLE	03/01	02/28	100	577
10222	EATON UNIT	MAINTAIN	1,315	3,400	1,249	19	CATTLE	03/01	02/28	100	227
10223	LARRY COLLINS	MAINTAIN	1,972	6,530	-	1	CATTLE	05/01	09/30	100	5
10225	COLVIN	CUSTODIAL	1,179	5,586	633	9	CATTLE	03/01	02/28	100	108
10226	CONSIDINE	CUSTODIAL	400	2,320	-	6	CATTLE	03/01	02/28	100	75
10228	COON CAN ALLOTMENT	IMPROVE	2,569	758	1,422	2	CATTLE	03/01	02/28	100	27
10230	COONS	CUSTODIAL	120	2,359	-	1	CATTLE	03/01	02/28	100	12
10231	COONS	MAINTAIN	227	507	-	40	CATTLE	07/14	12/15	27	55
10232	COURTNEY	MAINTAIN	4,506	9,381	1,280	1	CATTLE	03/01	04/30	100	2
10233	CRAFT	CUSTODIAL	280	6,078	640	5	CATTLE	03/01	02/28	100	66
10235	CRIDLAND	CUSTODIAL	240	1,541	-	2	CATTLE	03/01	02/28	100	23
10237	DEEP COULEE	MAINTAIN	1,512	9,038	688	25	CATTLE	03/01	02/28	100	309
10239	CURRY	CUSTODIAL	40	1,819	-	1	CATTLE	03/01	02/28	100	10
10241	DAILY	CUSTODIAL	360	1,320	-	7	CATTLE	03/01	02/28	100	87
10244	GASKILL	CUSTODIAL	80	1,045	-	1	CATTLE	03/01	02/28	100	6
10246	DAVIDSON	IMPROVE	2,156	640	2,399	15	CATTLE	03/01	02/28	100	181
10247	HORSE CREEK	CUSTODIAL	1,517	5,013	-	15	CATTLE	03/01	02/28	100	172
10248	MIL	CUSTODIAL	40	3,929	-	1	CATTLE	03/01	02/28	100	7
10250	REDER	CUSTODIAL	300	2,854	-	5	CATTLE	03/01	02/28	100	68
10251	MOLSTAD	CUSTODIAL	15	10	-	1	CATTLE	03/01	02/28	100	4
10252	WEST SIDE	CUSTODIAL	188	2,210	-	4	CATTLE	03/01	02/28	100	50
10253	DANS PLACE	MAINTAIN	534	293	-	28	CATTLE	06/01	12/26	66	127
10254	MIKES PLACE	MAINTAIN	1,618	1,732	-	21	CATTLE	03/01	02/28	100	262
10255	OXBOW	CUSTODIAL	94	25	-	2	HORSE	03/01	02/28	100	24
10257	DINSTEL	CUSTODIAL	240	4,825	-	2	CATTLE	03/01	02/28	100	24
10258	WARFORD UNIT	CUSTODIAL	120	960	-	4	CATTLE	03/01	02/28	100	48

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
10260	MATTER ALLOTMENT	CUSTODIAL	240	1,600	-	2	SHEEP	03/01	02/28	100	4
10261	DYE	CUSTODIAL	293	3,512	640	3	CATTLE	03/01	02/28	100	35
10265	ELGIN	CUSTODIAL	40	2,507	-	1	CATTLE	03/01	02/28	100	12
10266	HIWAY	CUSTODIAL	30	163	-	1	CATTLE	03/01	02/28	100	2
10267	MOLSTAD	CUSTODIAL	40	320	-	1	CATTLE	03/01	02/28	100	12
10268	CACHE CREEK	CUSTODIAL	161	1,600	-	3	CATTLE	03/01	02/28	100	37
10269	EMMONS	CUSTODIAL	75	6,077	-	1	CATTLE	03/01	02/28	100	16
10270	ELKHORN-BEAVER	IMPROVE	5,041	7,835	640	5	CATTLE	03/01	02/28	100	60
10271	BLOWOUT CREEK	CUSTODIAL	530	6,183	640	7	CATTLE	03/01	02/28	100	82
10272	BUG RANCH CO	CUSTODIAL	140	2,686	640	2	CATTLE	03/01	02/28	100	29
10273	HARTMANN	CUSTODIAL	2,466	12,136	640	26	CATTLE	03/01	02/28	100	314
10276	FARWELL	CUSTODIAL	186	1,982	-	4	CATTLE	03/01	02/28	100	44
10279	MCLEAN UNIT	CUSTODIAL	80	1,360	640	2	CATTLE	03/01	02/28	100	23
10283	FORTNER	MAINTAIN	796	1,496	-	9	CATTLE	03/01	02/28	100	114
10284	GREASY HILL	IMPROVE	2,692	2,668	-	31	CATTLE	03/01	02/28	100	372
10286	FOSTER	CUSTODIAL	210	-	-	3	CATTLE	03/01	02/28	100	40
10287	WILLIAMS	MAINTAIN	2,132	4,007	-	15	CATTLE	03/01	02/28	100	183
10289	НАҮ	CUSTODIAL	40	5,482	640	1	CATTLE	03/01	02/28	100	4
10290	DAGUE	CUSTODIAL	150	544	-	2	CATTLE	03/01	02/28	100	25
10291	BAKING POWDER	CUSTODIAL	310	2,964	640	6	CATTLE	03/01	02/28	100	72
10292	FRITZ	CUSTODIAL	430	2,030	-	6	CATTLE	03/01	02/28	100	73
10293	BERNARD	MAINTAIN	1,215	2,372	-	23	CATTLE	03/01	02/28	100	271
10294	JOHNSON	CUSTODIAL	202	1,341	-	5	CATTLE	03/01	02/28	100	67
10295	DUNCAN CREEK	IMPROVE	2,441	2,388	619	3	CATTLE	03/01	02/28	100	36
10296	TRAIL CREEK	MAINTAIN	1,908	9,346	14	29	CATTLE	03/01	02/28	100	356
10297	FTY RANCH	CUSTODIAL	109	8,427	-	2	CATTLE	03/01	02/28	100	24
10299	SODA CREEK	CUSTODIAL	331	-	640	3	CATTLE	03/01	02/28	100	36
10300	WILLIAMS CREEK	IMPROVE	1,594	3,413	-	3	CATTLE	03/01	02/28	100	33

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
10301	GASKILL	CUSTODIAL	80	7,905	1,280	1	CATTLE	03/01	02/28	100	14
10302	GASKILL	CUSTODIAL	34	5,417	-	1	CATTLE	03/01	02/28	100	7
10305	GIACOMETTO	MAINTAIN	3,724	21,153	1,600	70	CATTLE	03/01	02/28	100	844
10306	COOK UNIT	CUSTODIAL	700	4,175	-	12	CATTLE	03/01	02/28	100	143
10309	GILKEY UNIT	MAINTAIN	1,763	3,323	1,895	5	SHEEP	03/01	02/28	100	12
10310	GILGER RANCH	MAINTAIN	1,839	5,673	1,200	1	CATTLE	03/01	02/28	100	12
10313	GOTFREDSON	CUSTODIAL	819	3,060	320	19	CATTLE	03/01	02/28	100	223
10314	GRAMM	CUSTODIAL	160	480	-	3	CATTLE	03/01	02/28	100	23
10315	GRESENS	CUSTODIAL	320	1,280	-	4	CATTLE	03/01	02/28	100	51
10317	CURRY	CUSTODIAL	40	2,658	-	1	CATTLE	03/01	02/28	100	8
10318	GUYER	CUSTODIAL	160	1,769	640	1	CATTLE	03/01	02/28	100	16
10319	HERZOG	CUSTODIAL	1,030	2,761	3,049	1	CATTLE	03/01	02/28	100	15
10320	HALL	CUSTODIAL	775	4,498	640	18	CATTLE	04/16	02/28	100	189
10321	SECTION 3	CUSTODIAL	493	2,919	-	7	CATTLE	03/01	02/28	100	72
10322	SHEPHERD/COX UNIT	CUSTODIAL	120	3,680	489	4	CATTLE	05/01	11/30	100	28
10323	HANLAN	CUSTODIAL	519	3,799	-	8	CATTLE	03/01	02/28	100	100
10324	LAGRANGE CREEK	CUSTODIAL	414	6,587	-	9	CATTLE	03/01	02/28	100	108
10325	L O UNIT	CUSTODIAL	2,543	13,991	640	48	CATTLE	03/01	02/28	100	583
10326	WILEY UNIT SOUTH	MAINTAIN	4,352	9,789	892	92	CATTLE	03/01	02/28	100	1111
10328	ODIS HARKINS	CUSTODIAL	301	3,112	-	5	CATTLE	03/01	02/28	100	62
10329	HARRINGTON	CUSTODIAL	560	6,821	640	4	CATTLE	03/01	02/28	100	48
10333	HARWOOD	CUSTODIAL	520	2,562	-	5	CATTLE	03/01	02/28	100	67
10334	HAYES	CUSTODIAL	677	4,600	-	12	CATTLE	03/01	02/28	100	149
10335	HEDGES	CUSTODIAL	65	640	-	1	CATTLE	03/01	02/28	100	15
10336	HEGGEM	CUSTODIAL	233	882	-	5	CATTLE	03/01	02/28	100	68
10337	HESPE	MAINTAIN	2,109	2,258	120	36	CATTLE	03/01	02/28	100	432
10338	HILL	MAINTAIN	1,564	1,098	3,040	34	CATTLE	03/01	02/28	100	409
10339	HIRSCH	CUSTODIAL	320	4,117	-	2	CATTLE	03/01	02/28	100	26

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10340	FOREST CREEK	CUSTODIAL	160	4,550	640	3	CATTLE	03/01	02/28	100	27
10341	HOLMAN	CUSTODIAL	320	2,240	640	4	CATTLE	03/01	02/28	100	55
10343	HOPKINS	MAINTAIN	4,682	8,290	-	7	CATTLE	03/01	02/28	100	80
10344	PANNATIER	CUSTODIAL	120	2,600	-	3	CATTLE	03/01	02/28	100	31
10347	HUCKINS	MAINTAIN	71	1,348	-	1	CATTLE	03/01	02/28	100	12
10348	HUGHES	CUSTODIAL	40	1,530	640	1	CATTLE	03/01	02/28	100	5
10349	I U RANCH	CUSTODIAL	40	875	-	1	CATTLE	03/01	02/28	100	10
10350	R. IRION	CUSTODIAL	120	2,800	-	3	CATTLE	03/01	02/28	100	35
10351	JARDEE	CUSTODIAL	309	11,850	640	7	CATTLE	03/01	02/28	100	81
10352	JARDEE	CUSTODIAL	80	2,278	-	1	CATTLE	03/01	02/28	100	12
10354	JOHNSON EAST	CUSTODIAL	160	1,286	-	2	CATTLE	03/01	02/28	100	18
10355	JOHNSON WEST	CUSTODIAL	400	1,480	-	8	CATTLE	03/01	02/28	100	93
10356	JOHNSON	CUSTODIAL	30	3,600	-	1	CATTLE	03/01	02/28	100	7
10358	JOHNSTONE	MAINTAIN	1,040	1,400	640	28	CATTLE	03/01	02/28	100	345
10360	JOHNSTONE	IMPROVE	2,400	2,855	640	65	CATTLE	03/01	02/28	100	781
10362	JONES	CUSTODIAL	320	3,022	-	4	CATTLE	03/01	02/28	100	50
10365	JURICA	CUSTODIAL	840	6,340	-	19	CATTLE	03/01	02/28	100	228
10366	T & Y UNIT	CUSTODIAL	160	3,480	640	4	CATTLE	03/01	02/28	100	46
10367	KAUFMAN	CUSTODIAL	150	8,560	640	2	CATTLE	03/01	02/28	100	19
10369	MARKOS	CUSTODIAL	326	4,456	-	7	CATTLE	03/01	02/28	100	88
10370	BELLTOWER	MAINTAIN	4,534	3,963	640	15	CATTLE	03/01	02/28	100	179
10372	KNIPFER	CUSTODIAL	320	1,677	-	3	CATTLE	03/01	02/28	100	36
10373	KNIPFER	CUSTODIAL	223	3,248	-	5	CATTLE	03/01	02/28	100	67
10374	KNUDSON	MAINTAIN	668	1,717	640	12	CATTLE	03/01	02/28	100	139
10375	KORNEMANN	CUSTODIAL	120	3,760	640	2	CATTLE	03/01	02/28	100	22
10377	MARSHALL	CUSTODIAL	40	320	-	1	CATTLE	03/01	02/28	100	10
10379	KREITEL	MAINTAIN	4,498	9,002	960	69	CATTLE	03/01	02/28	100	828
10381	LABREE	CUSTODIAL	40	4,638	-	1	CATTLE	03/01	02/28	100	13

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10382	CYNDALE	CUSTODIAL	398	1,944	-	5	CATTLE	03/01	02/28	100	60
10384	SPRING CREEK	IMPROVE	2,611	1,255	525	1	CATTLE	05/14	10/30	58	3
10385	LANCASTER	MAINTAIN	1,526	6,818	-	33	CATTLE	03/01	02/28	100	392
10386	EAST FORK	MAINTAIN	3,005	11,007	640	5	CATTLE	06/01	09/15	51	9
10387	PIKKULA	CUSTODIAL	40	2,923	747	1	CATTLE	03/01	02/28	100	10
10388	LANNING	MAINTAIN	1,921	7,031	-	12	CATTLE	03/01	02/28	100	145
10389	DEERWESTER UNIT	IMPROVE	1,600	7,040	1,186	6	CATTLE	03/01	02/28	100	75
10392	BYRNE	CUSTODIAL	40	2,748	-	1	CATTLE	03/01	02/28	100	13
10393	LAWRENCE	CUSTODIAL	294	2,340	525	1	CATTLE	03/01	02/28	100	14
10394	NELSON CREEK	CUSTODIAL	360	3,384	640	4	CATTLE	03/01	02/28	100	50
10395	LEHMAN	MAINTAIN	1,280	5,261	400	29	CATTLE	03/01	02/28	100	349
10396	LEWIS	CUSTODIAL	240	1,799	-	5	CATTLE	03/01	02/28	100	59
10398	LINVILLE	MAINTAIN	438	760	160	4	CATTLE	03/01	02/28	100	53
10402	LLOYD	CUSTODIAL	71	2,187	-	1	CATTLE	03/01	02/28	100	16
10405	BALDICK	CUSTODIAL	706	8,009	640	13	CATTLE	03/01	02/28	100	158
10406	LOVEC	CUSTODIAL	40	799	640	1	CATTLE	03/01	02/28	100	11
10408	MADER	CUSTODIAL	40	2,068	-	1	CATTLE	03/01	02/28	100	8
10409	NOLAN	CUSTODIAL	258	2,549	43	3	CATTLE	03/01	02/28	100	34
10410	FRANKLIN	CUSTODIAL	80	1,393	-	2	CATTLE	03/01	02/28	100	24
10412	MALENOVSKY	CUSTODIAL	80	780	-	1	CATTLE	03/01	02/28	100	16
10414	MATHWIG	MAINTAIN	714	1,280	-	1	CATTLE	03/01	02/28	100	12
10415	MAUPIN	CUSTODIAL	20	479	137	2	SHEEP	03/01	02/28	100	6
10416	MCAULAY RANCH	CUSTODIAL	320	2,170	-	2	CATTLE	03/01	02/28	100	22
10417	MCCAMISH	MAINTAIN	1,053	2,007	320	2	CATTLE	03/01	02/28	100	2
10420	RATTLESNAKE CRMP	IMPROVE	4,416	4,588	2,360	5	HORSE	03/01	02/28	100	75
10422	DEADMAN CREEK	MAINTAIN	1,870	682	200	115	CATTLE	04/01	05/10	66	100
10426	KEMP	MAINTAIN	1,828	4,277	320	2	CATTLE	03/01	02/28	100	24
10428	JIM	CUSTODIAL	160	1,739	-	1	CATTLE	03/01	02/28	100	13

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10429	KIWAH	CUSTODIAL	252	3,690	-	5	CATTLE	03/01	02/28	100	57
10430	MEYER	CUSTODIAL	120	4,690	-	1	CATTLE	03/01	02/28	100	18
10431	MILLS	CUSTODIAL	286	2,244	-	6	CATTLE	03/01	02/28	100	74
10432	MINOW RANCH	CUSTODIAL	460	14,541	640	11	CATTLE	03/01	02/28	100	130
10433	THULESEN	CUSTODIAL	396	4,339	-	9	CATTLE	03/01	02/28	100	105
10435	BEAR SKULL UNIT	CUSTODIAL	40	7,910	640	1	CATTLE	03/01	02/28	100	7
10449	NEECE	CUSTODIAL	40	640	-	1	CATTLE	03/01	02/28	100	12
10450	NEFSY-UNALLOCATED	MAINTAIN	20	-	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
10451	NEIMAN	IMPROVE	120	2,000	544	1	CATTLE	03/01	02/28	100	12
10452	LITTLE MISSOURI	CUSTODIAL	112	857	-	1	CATTLE	03/01	02/28	100	18
10453	NESBIT	IMPROVE	2,708	2,934	1,787	1	CATTLE	05/15	07/15	76	2
10455	SCHOOL HOUSE	CUSTODIAL	128	2,332	-	1	CATTLE	03/01	02/28	100	12
10458	HOME PLACE	CUSTODIAL	47	3,006	-	1	CATTLE	03/01	02/28	100	8
10460	COTTONWOOD CREEK	MAINTAIN	12,304	27,058	2,546	1	CATTLE	03/01	02/28	100	14
10462	CASPER	CUSTODIAL	73	4,889	-	1	CATTLE	03/01	02/28	100	10
10466	ODANIEL	CUSTODIAL	97	2,240	-	3	CATTLE	03/01	02/28	100	36
10467	RIDGE	CUSTODIAL	145	1,980	-	2	CATTLE	03/01	02/28	100	24
10474	OXFORD	CUSTODIAL	80	920	-	2	CATTLE	03/01	02/28	100	18
10476	STRAUGH	MAINTAIN	640	800	-	30	CATTLE	03/01	02/28	44	158
10477	PATTEN HOME PLACE	MAINTAIN	430	2,739	120	9	CATTLE	03/01	02/28	100	104
10479	BEAVER LODGE	CUSTODIAL	38	120	-	1	CATTLE	03/01	02/28	100	12
10481	PATTEN	MAINTAIN	773	999	-	14	CATTLE	03/01	02/28	100	166
10483	TIMBERED	CUSTODIAL	80	80,150	-	1	CATTLE	03/01	02/28	100	16
10486	PILSTER RANCH CORP	MAINTAIN	5,158	9,407	-	1	CATTLE	06/01	08/30	100	3
10488	PORTWINE	CUSTODIAL	1,209	5,026	-	21	CATTLE	03/01	02/28	100	253
10494	RANDALL INC	IMPROVE	7,947	6,458	1,040	5	CATTLE	03/01	02/28	100	65
10495	BOHLS	CUSTODIAL	80	1,238	-	2	CATTLE	03/01	02/28	100	27
10496	GARR UNIT	CUSTODIAL	932	5,530	640	21	CATTLE	03/01	02/28	100	259
Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
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10499	RICE	CUSTODIAL	43	446	-	1	CATTLE	03/01	02/28	100	10
10500	OLSON	CUSTODIAL	160	640	-	4	CATTLE	03/01	02/28	100	44
10519	T & C SMITH PLACE	CUSTODIAL	635	4,659	-	11	CATTLE	03/01	02/28	100	132
10537	HAMILTON SCOTT	IMPROVE	7,497	35,766	3,200	22	YRLING CATTLE	03/01	02/28	100	266
10538	WILLIAM SCOTT PLACE	MAINTAIN	1,200	19,099	1,280	20	CATTLE	03/01	02/28	100	232
10551	BRIMMER	CUSTODIAL	160	470	-	19	CATTLE	03/01	02/28	100	45
10553	COTTONWOOD CREEK	MAINTAIN	4,023	2,910	632	1	CATTLE	06/01	08/31	47	1
10555	WEST MIZPAH	CUSTODIAL	984	4,876	796	11	CATTLE	03/01	02/28	100	131
10556	BRADSHAW	CUSTODIAL	40	690	-	1	CATTLE	03/01	02/28	100	10
10557	WILLIAMS UNIT	MAINTAIN	2,490	3,849	4,666	25	CATTLE	03/01	02/28	100	300
10558	TALCOTT	CUSTODIAL	920	4,140	640	2	CATTLE	03/01	02/28	100	28
10559	TALKINGTON	MAINTAIN	660	240	-	30	CATTLE	06/01	10/30	100	150
10560	RUE CREEK	CUSTODIAL	160	2,403	-	4	CATTLE	03/01	02/28	100	43
10561	MEYERS	CUSTODIAL	40	1,971	-	1	CATTLE	03/01	02/28	100	8
10562	BRINDLEY	CUSTODIAL	80	2,747	-	1	CATTLE	03/01	02/28	100	12
10563	EB COMMON	MAINTAIN	572	-	-	13	CATTLE	03/01	02/28	100	166
10600	SQUARE TOP THREE	CUSTODIAL	203	3,136	-	3	CATTLE	03/01	02/28	100	36
10603	WILLIAMS	CUSTODIAL	82	1,902	640	1	CATTLE	03/01	02/28	100	18
10604	COAL CREEK	CUSTODIAL	664	2,608	-	9	CATTLE	03/01	02/28	100	107
10605	LITTLE POWDER	CUSTODIAL	80	2,453	-	2	CATTLE	03/01	02/28	100	27
10606	BELLE CREEK HEAD	CUSTODIAL	160	3,803	640	3	CATTLE	03/01	02/28	100	40
10607	WILLIAMS RANCHES	IMPROVE	11,234	9,143	1,920	10	CATTLE	03/01	02/28	100	120
10609	BEESLEY	MAINTAIN	974	3,304	-	1	HORSE	03/01	02/28	100	16
10611	W L RANCH	CUSTODIAL	1,021	19,476	2,394	24	CATTLE	03/01	02/28	100	293
10612	WOODARD	MAINTAIN	3,013	10,437	640	26	CATTLE	03/01	02/28	100	318
10613	WILSON & ORMESHER	MAINTAIN	2,343	12,083	-	1	CATTLE	03/01	02/28	100	1
10614	HAY CREEK	CUSTODIAL	200	560	-	4	CATTLE	03/01	02/28	100	53
10615	WYOTANA RANCH	MAINTAIN	6,038	7,776	1,518	6	CATTLE	03/01	02/28	100	72

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
10616	YATES	CUSTODIAL	1,426	5,790	-	20	CATTLE	03/01	02/28	100	238
10617	NORTH END	IMPROVE	659	2,154	-	110	CATTLE	08/02	12/01	20	88
10618	ZUPANIK	CUSTODIAL	154	2,994	-	3	CATTLE	03/01	02/28	100	39
10626	WATT CREEK	CUSTODIAL	280	760	-	6	CATTLE	03/01	02/28	100	73
10633	BLAIR	CUSTODIAL	25	4,840	-	1	CATTLE	03/01	02/28	100	6
10636	AMSDEN	CUSTODIAL	40	4,609	-	1	CATTLE	03/01	02/28	100	8
10637	NISLEY DAN	MAINTAIN	2,338	685,491	640	34	CATTLE	03/01	02/28	100	403
10643	HAMMEL	CUSTODIAL	80	2,972	-	2	CATTLE	03/01	02/28	100	22
10644	GRESLIN	MAINTAIN	2,033	3,541	973	2	CATTLE	03/01	02/28	100	27
10645	MILLS	MAINTAIN	887	2,163	-	1	CATTLE	03/01	02/28	100	10
10647	1ST AND 2ND CREEKS	MAINTAIN	2,675	18,950	1,783	32	CATTLE	03/01	02/28	100	389
10648	LINGER	CUSTODIAL	641	2,081	-	5	CATTLE	03/01	02/28	100	58
10649	HARRIS CREEK UNIT	MAINTAIN	700	4,431	-	5	CATTLE	03/01	02/28	100	64
10650	3RD AND 4TH CREEKS	IMPROVE	4,092	9,957	1,280	58	CATTLE	03/01	02/28	100	704
10652	HORSETRACK DRAW	MAINTAIN	1,291	730	640	1	CATTLE	06/01	08/15	77	2
10654	CLINE UNIT	MAINTAIN	1,035	4,070	-	3	CATTLE	03/01	02/28	100	36
10659	JONES & OWENS	CUSTODIAL	237	1,320	-	2	CATTLE	03/01	02/28	100	25
10661	ELMORE	CUSTODIAL	204	1,880	-	5	CATTLE	03/01	02/28	100	54
10663	WOLFF	IMPROVE	2,587	11,304	640	2	CATTLE	03/01	02/28	100	28
10665	HARKINS	CUSTODIAL	40	160	-	1	CATTLE	03/01	02/28	100	10
10669	FIRST CREEK	CUSTODIAL	840	3,939	-	10	CATTLE	03/01	02/28	100	116
10677	STOLTENBERG	MAINTAIN	1,258	1,360	-	70	CATTLE	06/01	08/31	100	212
10678	TAYLOR HILLS	MAINTAIN	2,892	2,360	380	2	CATTLE	03/01	02/28	100	24
10679	BUG-DENSON BROTHERS	CUSTODIAL	910	2,077	3,238	18	CATTLE	03/01	02/28	100	221
10682	DRY CREEK	CUSTODIAL	680	4,685	-	9	CATTLE	03/01	02/28	100	113
10683	HADDOW CREEK	MAINTAIN	1,280	3,520	-	15	CATTLE	04/01	12/26	100	133
10685	BEYL	CUSTODIAL	40	282	-	1	CATTLE	03/01	02/28	100	6
10686	DEER CREEK SOUTH	MAINTAIN	4,166	6,563	640	57	CATTLE	03/01	02/28	100	684

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
10689	COAL BANK PASTURE	MAINTAIN	946	1,212	-	20	CATTLE	03/01	02/28	100	244
10692	S H RANCH	CUSTODIAL	432	5,701	320	5	CATTLE	03/01	02/28	100	54
10698	HORNER	CUSTODIAL	40	366	-	1	CATTLE	03/01	02/28	100	10
10701	MCLEES	CUSTODIAL	187	960	497	5	CATTLE	03/01	02/28	100	57
10702	MCCLURE	CUSTODIAL	40	1,400	-	1	CATTLE	03/01	02/28	100	8
10704	YATES PLACE	CUSTODIAL	320	1,217	-	62	CATTLE	05/15	09/15	50	119
10706	HARKINS	CUSTODIAL	280	640	-	8	CATTLE	03/01	02/28	100	93
10707	DENSON	CUSTODIAL	80	5,277	-	2	CATTLE	03/01	02/28	100	28
10708	PARKER LEASE	CUSTODIAL	51	2,880	-	1	CATTLE	03/01	02/28	100	14
10709	SOUTH DEEP CREEK AMP	IMPROVE	3,469	11	14	224	CATTLE	06/15	09/04	99	598
10710	LEE ALLOTMENT	CUSTODIAL	200	3,398	-	2	CATTLE	03/01	02/28	100	26
10712	WRIGHT	CUSTODIAL	12	6,107	-	1	CATTLE	03/01	02/28	100	3
10713	JOPPA UNIT	CUSTODIAL	6	23	-	1	CATTLE	03/01	02/28	100	2
10715	HARDY UNIT	CUSTODIAL	2,545	18,746	1,278	29	CATTLE	03/01	02/18	48	162
10717	GOLD	CUSTODIAL	41	4,919	640	1	INDIGENOUS	03/01	02/28	100	7
10718	RAFFERTY UNIT	MAINTAIN	2,320	10,293	640	33	CATTLE	03/01	02/27	100	398
10719	ROAD UNIT	CUSTODIAL	800	11,036	-	11	CATTLE	03/01	02/28	100	135
10720	ELMHURST CREEK FORTY	CUSTODIAL	40	14,869	2,320	1	CATTLE	03/01	02/28	100	12
10722	DECKER UNIT	CUSTODIAL	706	3,920	600	13	CATTLE	03/01	02/28	100	161
10723	ТОРЕ	CUSTODIAL	40	4,094	960	1	CATTLE	03/01	02/28	100	11
10724	WILLIAMS CREEK	CUSTODIAL	420	2,380	-	6	CATTLE	03/01	02/28	100	69
10725	HOME UNIT	IMPROVE	332	2,193	748	1	HORSE	03/01	02/28	100	11
10728	PILGRIM CREEK	IMPROVE	4,762	2,784	4,768	1	CATTLE	03/01	02/28	100	9
10729	GARST UNIT	CUSTODIAL	168	1,310	-	4	CATTLE	03/01	02/28	100	52
10731	SOUTH PLACE	CUSTODIAL	12	1,909	640	1	CATTLE	03/01	02/28	100	3
10732	SOUTH	CUSTODIAL	46	493	-	1	CATTLE	03/01	02/28	100	14
10733	PARKS	CUSTODIAL	360	1,520	-	4	CATTLE	03/01	02/28	100	51
10734	EVENSON	CUSTODIAL	80	767	-	1	CATTLE	03/01	02/28	100	11

Allotment Number	Allotment Name	Allot Management Status	Allot Public Acres	Allot Private Acres	Allot State Acres	Auth Sched Livestock Number	Auth Sched Livestock Kind	Auth Sched Begin Date	Auth Sched End Date	Auth Sched %PL	Auth Sched AUMs
10744	SCOTT RIVER UNIT	CUSTODIAL	40	4,429	-	1	CATTLE	03/01	02/28	100	16
10746	HART CREEK	CUSTODIAL	321	23,766	960	5	CATTLE	03/01	02/28	100	54
10747	SEVEN OWL DIVIDE	IMPROVE	4,052	4,240	640	1	CATTLE	08/18	09/18	86	1
10750	BC CREEK	CUSTODIAL	106	1,047	-	1	CATTLE	03/01	02/28	100	34
10752	EWALT	IMPROVE	1,000	2,239	-	15	CATTLE	03/01	02/28	100	180
10754	J. POWERS	CUSTODIAL	40	1,000	-	1	CATTLE	03/01	02/28	100	8
20742	SOUTH LUTHER	MAINTAIN	640	1,482	640	6	CATTLE	04/01	12/31	100	54
25007	MOSBY ROAD	CUSTODIAL	80	-	-	1	CATTLE	03/01	02/28	100	18
TOTALS			1,468,503	7,468,537	486,200						10416

Appendix B: Montana Noxious Weed List

Effective June 21, 2019

<u>PRIORITY 1A</u> These weeds are not present or have a very limited presence in Montana. Management criteria will require eradication if detected, education, and prevention:

- (a) Yellow starthistle (Centaurea solstitialis)
- (b) Dyer's woad (Isatis tinctoria)
- (c) Common reed (Phragmites australis ssp. australis)
- (d) Medusahead (Taeniatherum caput-medusae)

PRIORITY 1B These weeds have limited presence in

Montana. Management criteria will require eradication or containment and education:

(a) Knotweed complex (*Polygonum cuspidatum, P. sachalinense, P. × bohemicum, Fallopia*

japonica, F. sachalinensis, F. × bohemica, Reynoutria japonica, R. sachalinensis, and R.× bohemica)

- (b) Purple loosestrife (Lythrum salicaria)
- (c) Rush skeletonweed (Chondrilla juncea)
- (d) Scotch broom (Cytisus scoparius)
- (e) Blueweed (Echium vulgare)

<u>PRIORITY 2A</u> These weeds are common in isolated areas of Montana. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts:

- (a) Tansy ragwort (Senecio jacobaea, Jacobaea vulgaris)
- (b) Meadow hawkweed complex (Hieracium caespitosum, H. praealturm,

H. floridundum, and Pilosella caespitosa)

- (c) Orange hawkweed (Hieracium aurantiacum, Pilosella aurantiaca)
- (d) Tall buttercup (*Ranunculus acris*)
- (e) Perennial pepperweed (Lepidium latifolium)
- (f) Yellowflag iris (Iris pseudacorus)
- (g) Eurasian watermilfoil (*Myriophyllum spicatum, Myriophyllum spicatum x Myriophyllum sibiricum*)
- (h) Flowering rush (Butomus umbellatus)
- (i) Common buckthorn (Rhamnus cathartica L.)
- *(j)* Ventenata (Ventenata dubia)

<u>PRIORITY 2B</u> These weeds are abundant in Montana and widespread in many counties. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts:

(a) Canada thistle (Cirsium arvense)

(b) Field bindweed (Convolvulus arvensis)

(c) Leafy spurge (Euphorbia esula)

(d) Whitetop (Cardaria draba, Lepidium draba)

(e) Russian knapweed (Acroptilon repens, Rhaponticum repens)

(f) Spotted knapweed (Centaurea stoebe, C.maculosa)

(g) Diffuse knapweed (*Centaurea diffusa*)

(h) Dalmatian toadflax (Linaria dalmatica)

(i) St. Johnswort (Hypericum perforatum)

(j) Sulfur cinquefoil (Potentilla recta)

(k) Common tansy (Tanacetum vulgare)

(I) Oxeye daisy (*Leucanthemum vulgare*)

(m) Houndstongue (*Cynoglossum officinale*)

(n) Yellow toadflax (*Linaria vulgaris*)

(o) Saltcedar (*Tamarix spp.*)

(p) Curlyleaf pondweed (Potamogeton crispus)

(q) Hoary alyssum (Berteroa incana)

PRIORITY 3 Regulated Plants: (NOT MONTANA LISTED NOXIOUS WEEDS)

These regulated plants have the potential to have significant negative impacts. The plant may not be intentionally spread or sold other than as a contaminant in agricultural products. The state recommends research, education and prevention to minimize the spread of the regulated plant.

(a) Cheatgrass (Bromus tectorum)

(b) Hydrilla (Hydrilla verticillata)

(c) Russian olive (*Elaeagnus angustifolia*)

(d) Brazilian waterweed (*Egeria densa*)

(e) Parrot feather watermilfoil (Myriophyllum aquaticum or M. brasiliense)

Appendix C: RAWS Precipitation Table C1: Precipitation summary in the MCFO from select RAWS stations, stations were only included if they have data time periods 1984-2009 and 2010-2019. Stations included also have at least 20 years of precipitation data for 1984-2009 and at least nine years for 2010-2019.

Station	Years	Ave. Annual Precip. (Inches)
	1984-2009	14.8
BRANDENBERG, MT US	2010-2019	16.5
	1984-2009	13.2
BREDETTE, MIT US	2010-2019	15.1
	1984-2009	14.9
BRUSETT 3 N, MIT US	2010-2019	19.0
	1984-2009	13.5
BROADUS, MIT US	2010-2019	16.3
	1984-2009	14.1
BUSBY, MIT US	2010-2019	17.5
	1984-2009	13.1
CIRCLE, MIT US	2010-2019	15.9
	1984-2009	14.2
COLSTRIP, MIT US	2010-2019	18.7
	1984-2009	17.0
EKALANA, INT US	2010-2019	19.6
	1984-2009	15.2
FORSTIN, MILOS	2010-2019	16.8
	1984-2009	11.6
GLASGOW INTERNATIONAL AIRPORT, INT US	2010-2019	15.5
	1984-2009	13.8
	2010-2019	16.8
KNORS A SW MT US	1984-2009	15.8
	2010-2019	17.5
MELSTONE MT US	1984-2009	14.9
	2010-2019	16.3
MILES CITY AIRPORT MT US	1984-2009	12.2
	2010-2019	13.6
	1984-2009	13.6
	2010-2019	15.8
	1984-2009	14.7
	2010-2019	17.2
	1984-2009	14.1
	2010-2019	16.0
SAVAGE MILLS	1984-2009	14.1
	2010-2019	16.0



Figure C2: Map of RAWS stations precipitation data were obtained from:

	No. of plots	Avg Grass/Sedge Foliar Cover (Standard Deviation) (%)	ESD Reference Grass/Sedge Cover (%)	Avg Forbs Foliar Cover (Standard Deviation) (%)	ESD Reference Forb Cover (%)	Avg Shrub Foliar Cover (Standard Deviation) (%)	ESD Reference Shrub Cover (%)	Avg Litter Cover (Standard Deviation) (%)	ESD Reference Litter Cover (%)	Avg Bare Ground (Standard Deviation) (%)	ESD Reference Bare Ground
Belle Creek											
Clayey	3	79 (± 9)	55-85	16 (± 17)	5-10	15 (± 14)	1-5	68 (± 30)	35-60	3 (± 5)	< 20
Sandy	2	71 (± 6)	70-85	12 (± 11)	5-10	21 (± 5)	T-5	48 (± 18)	40-50	8 (± 12)	< 20
Silty	1	62	60-85	13	1-5	7	T-1	58	50-60	13	< 20
Silty Steep	2	56 (± 27)	60-70	17 (± 12)	1-5	13 (± 6)	5-10	53 (± 41)	40-48	23 (± 17)	< 25
Bickerdyke Rd											
Clayey	9	76 (± 15)	55-85	25 (± 21)	5-10	10 (± 5)	1-5	73 (± 15)	35-60	5 (± 4)	< 20
Claypan	1	58	30-50	67	5-10	12	2-10	40	5-10	3	< 40
Dense Clay	1	72	20-30	6	T-1	5	20-25	59	15-20	20	< 60
Silty	1	86	60-85	43	1-5		T-1	76	50-60	1	< 20
Brackett Creek											
Clayey	1	77	55-85	9	5-10	26	1-5	67	35-60	12	< 20
Claypan	1	87	30-50	1	5-10	2	2-10	74	5-10	3	< 40
Sandy Steep	1	77	55-70	5	5-10	17	T-5	58	15-25	1	< 25
Silty	3	79 (± 7)	60-85	22 (± 12)	1-5	7 (± 6)	T-1	67 (± 16)	50-60	4 (± 4)	< 20
Cache Creek											
Sands	1	84	50-60	18	5-10	14	1-3	93	40-49	0	< 20

Appendix D: Indicator Data for all Plots in Zones by Ecological Site

	No. of plots	Avg Grass/Sedge Foliar Cover (Standard Deviation) (%)	ESD Reference Grass/Sedge Cover (%)	Avg Forbs Foliar Cover (Standard Deviation) (%)	ESD Reference Forb Cover (%)	Avg Shrub Foliar Cover (Standard Deviation) (%)	ESD Reference Shrub Cover (%)	Avg Litter Cover (Standard Deviation) (%)	ESD Reference Litter Cover (%)	Avg Bare Ground (Standard Deviation) (%)	ESD Reference Bare Ground
CB Grazing		X* 7				(* <i>1</i>					
District											
Claypan Saline	4	52 (± 14)	30-50	21 (± 24)	5-10	12 (± 9)	2-10	45 (± 23)	5-10	18 (± 17)	< 40
Upland	2	49 (± 28)	10-15	7 (± 4)	1-5	10 (± 1)	20-25	35 (± 17)	10-15	30 (± 16)	< 60
Silty	1	95	60-85	32	1-5	12	T-1	92	50-60	4	< 20
Cedar Creek											
Clayey	1	75	55-85	45	5-10	9	1-5	60	35-60	7	< 20
Silty	2	87 (± 2)	60-85	34 (± 16)	1-5	7 (± 3)	T-1	73 (± 20)	50-60	1	< 20
Cherry Creek											
Clayey	1	80	55-85	23	5-10	0	1-5	97	35-60	1	< 20
Coarse Clay	1	63	30-50	7	1-5	7	5-10	9	15-25	22	< 50
Sands	1	6	50-60	22	5-10	0	1-3	37	40-49	51	< 20
Sandy	2	77 (± 7)	70-85	13 (± 7)	5-10	6 (± 6)	T-5	67 (± 14)	40-50	6 (± 2)	< 20
Silty	20	85 (± 17)	60-85	14 (± 15)	1-5	7 (± 9)	T-1	62 (± 22)	50-60	4 (± 9)	< 20
Silty Steep Very	2	64 (± 21)	60-70	10 (± 1)	1-5	5 (± 4)	5-10	57 (± 20)	40-48	7 (± 8)	< 25
Shallow	1	74	15-20	20	1-5	1	15-25	28	10-15	6	< 50
Cottonwood Creek Rd											
Clayey	4	70 (± 19)	55-85	12 (± 6)	5-10	9 (± 6)	1-5	60 (± 28)	35-60	13 (± 10)	< 20
Dense Clay	1	30	20-30	11	T-1	5	20-25	3	15-20	50	< 60

	No. of plots	Avg Grass/Sedge Foliar Cover (Standard Deviation) (%)	ESD Reference Grass/Sedge Cover (%)	Avg Forbs Foliar Cover (Standard Deviation) (%)	ESD Reference Forb Cover (%)	Avg Shrub Foliar Cover (Standard Deviation) (%)	ESD Reference Shrub Cover (%)	Avg Litter Cover (Standard Deviation) (%)	ESD Reference Litter Cover (%)	Avg Bare Ground (Standard Deviation) (%)	ESD Reference Bare Ground
Saline											
Upland	4	32 (± 8)	10-15	7 (± 5)	1-5	13 (± 7)	20-25	21 (± 12)	10-15	33 (± 18)	< 60
Shallow	1	73	20-30	11	1-5	3	10-15	49	15-25	7	< 30
Shallow Clay	1	66	20-40	23	1-5	17	10-15	66	20-30	10	< 40
Crow Creek Clayey	2	75 (± 22)	55-85	12 (± 0.5)	5-10	5 (± 0.5)	1-5	53 (± 49)	35-60	14 (± 18)	< 20
Saline											
Upland	1	75	10-15	14	1-5	1	20-25	63	10-15	8	< 60
Silty	1	91	60-85	6	1-5	14	T-1	31	50-60	6	< 20
Decker Clayey Silty	1 2	48 82 (± 4)	55-85 60-85	3 17 (± 1)	5-10 1-5	11 26 (± 1)	1-5 T-1	95 86 (± 4)	35-60 50-60	1 4 (± 1)	< 20 < 20
Dry Arm		. ,		. ,		. ,		. ,		. ,	
Clayey	1	65	55-85	13	5-10	19	1-5	77	35-60	10	< 20
Claypan	1	52	30-50	27	5-10	8	2-10	57	5-10	8	< 40
Silty	1	53	60-85	27	1-5	3	T-1	41	50-60	14	< 20
Silty Steep	1	71	60-70	4	1-5	19	5-10	11	40-48	11	< 25
East Musselshell											
Clayey	4	55 (± 22)	55-85	12 (± 7)	5-10	5 (± 3)	1-5	46 (± 24)	35-60	17 (± 11)	< 20
Sands	1	49	50-60	11	5-10	3	1-3	6	40-49	36	< 20
Shallow	2	10 (± 7)	20-30	2 (± 2)	1-5	0 (± 0.4)	10-15	43 (± 46)	15-25	47 (± 42)	< 30

D3

	No. of plots	Avg Grass/Sedge Foliar Cover (Standard Deviation) (%)	ESD Reference Grass/Sedge Cover (%)	Avg Forbs Foliar Cover (Standard Deviation) (%)	ESD Reference Forb Cover (%)	Avg Shrub Foliar Cover (Standard Deviation) (%)	ESD Reference Shrub Cover (%)	Avg Litter Cover (Standard Deviation) (%)	ESD Reference Litter Cover (%)	Avg Bare Ground (Standard Deviation) (%)	ESD Reference Bare Ground
Shallow Clay	2	82 (± 1)	20-40	43 (± 2)	1-5	9 (± 1)	10-15	91 (± 5)	20-30	4 (± 4)	< 40
Silty Very	1	3	60-85	1	1-5	0	T-1	43	50-60	29	< 20
Shallow	2	9 (± 4)	15-20	1 (± 2)	1-5	0 (± 0)	15-25	57 (± 18)	10-15	24 (± 3)	< 50
Finger Buttes											
Clayey	4	65 (± 8)	55-85	9 (± 7)	5-10	10 (± 6)	1-5	60 (± 27)	35-60	9 (± 4)	< 20
Coarse Clay	2	70 (± 6)	30-50	18 (± 9)	1-5	5 (± 3)	5-10	52 (± 23)	15-25	9 (± 3)	< 50
Shallow Clay	1	42	20-40	17	1-5	6	10-15	41	20-30	26	< 40
Silty	2	49 (± 6)	60-85	15 (± 3)	1-5	25 (± 18)	T-1	69 (± 13)	50-60	4 (± 3)	< 20
Glaciated											
Clayey	1	85	55-85	10	5-10	5	1-5	51	35-60	3	< 20
Sands	1	79	50-60	13	5-10	9	1-3	29	40-49	5	< 20
Shallow Clay	1	77	20-40	15	1-5	9	10-15	31	20-30	6	< 40
Silty	1	85	60-85	13	1-5	5	T-1	86	50-60	2	< 20
Thin Breaks	2	83 (± 6)	20-50	8 (± 1)	5-10	11 (± 9)	5-20	90 (± 5)	30-60	0 (± 1)	< 60
Glendive											
Clayey	2	56 (± 23)	55-85	17 (± 6)	5-10	2 (± 3)	1-5	45 (± 11)	35-60	7 (± 1)	< 20
Sandy	1	52	70-85	25	5-10	6	T-5	14	40-50	0	< 20
Silty	4	90 (± 25)	60-85	17 (± 22)	1-5	11 (± 8)	T-1	51 (± 24)	50-60	5 (± 3)	< 20
Haxby Clayey	2	86 (± 26)	55-85	20 (± 6)	5-10	11 (± 4)	1-5	63 (± 17)	35-60	14 (± 14)	< 20

	No. of plots	Avg Grass/Sedge Foliar Cover (Standard Deviation) (%)	ESD Reference Grass/Sedge Cover (%)	Avg Forbs Foliar Cover (Standard Deviation) (%)	ESD Reference Forb Cover (%)	Avg Shrub Foliar Cover (Standard Deviation) (%)	ESD Reference Shrub Cover (%)	Avg Litter Cover (Standard Deviation) (%)	ESD Reference Litter Cover (%)	Avg Bare Ground (Standard Deviation) (%)	ESD Reference Bare Ground
Dense Clay	1	71	20-30	21	T-1	6	20-25	61	15-20	9	< 60
Overflow	1	65	55-70	3	1-5	25	5-10	84	50-60	11	< 10
Sands	1	88	50-60	7	5-10	2	1-3	69	40-49	0	< 20
Sandy	6	79 (± 16)	70-85	15 (± 16)	5-10	9 (± 5)	T-5	47 (± 16)	40-50	12 (± 9)	< 20
Silty	8	88 (± 25)	60-85	15 (± 14)	1-5	12 (± 15)	T-1	69 (± 22)	50-60	8 (± 12)	< 20
Silty Steep	1	71	60-70	10	1-5	6	5-10	74	40-48	6	< 25
Indian Creek Rd Clayey Dense Clay Shallow Clay Knowlton Gravel Sands Sandy Silty	1 1 1 1 4 3	66 53 57 80 75 88 (± 4) 65 (± 21)	55-85 20-30 20-40 15-20 50-60 70-85 60-85	29 27 16 38 10 9 (± 5) 20 (± 13)	5-10 T-1 1-5 1-5 5-10 5-10 1-5	0 2 3 9 10 6 (± 4) 12 (± 10)	1-5 20-25 10-15 15-25 1-3 T-5 T-1	79 67 63 55 41 45 (± 28) 64 (± 33)	35-60 15-20 20-30 30-40 40-49 40-50 50-60	3 15 19 1 9 5 (± 3) 8 (± 9)	< 20 < 60 < 40 < 10 < 20 < 20 < 20 < 20
Little Powder River Sandy Shallow Clay Silty	1 1 3	87 45 66 (± 31)	70-85 20-40 60-85	3 3 15 (± 4)	5-10 1-5 1-5	21 11 3 (± 3)	T-5 10-15 T-1	95 57 40 (± 9)	40-50 20-30 50-60	1 29 16 (± 17)	< 20 < 40 < 20

	No. of	Avg Grass/Sedge Foliar Cover (Standard Deviation)	ESD Reference Grass/Sedge	Avg Forbs Foliar Cover (Standard Deviation)	ESD Reference Forb	Avg Shrub Foliar Cover (Standard Deviation)	ESD Reference Shrub	Avg Litter Cover (Standard Deviation)	ESD Reference Litter	Avg Bare Ground (Standard Deviation)	ESD Reference Bare
	plots	(%)	Cover (%)	(%)	Cover (%)	(%)	Cover (%)	(%)	Cover (%)	(%)	Ground
Mildred											
Clayey	2	103 (± 4)	55-85	9 (± 7)	5-10	9 (± 5)	1-5	51 (± 26)	35-60	7 (± 4)	< 20
Gravel	1	87	15-20	4	1-5	1	15-25	81	30-40	1	< 10
Sands	1	83	50-60	29	5-10	3	1-3	84	40-49	4	< 20
Sandy	3	85 (± 18)	70-85	9 (± 6)	5-10	8 (± 14)	T-5	74 (± 18)	40-50	3 (± 6)	< 20
Sandy Steep	1	78	55-70	5	5-10	20	T-5	16	15-25	12	< 35
Shallow Clay	1	73	20-40	17	1-5	6	10-15	60	20-30	2	< 40
Silty	7	89 (± 6)	60-85	14 (± 9)	1-5	4 (± 4)	T-1	65 (± 12)	50-60	2 (± 2)	< 20
Missouri											
Overflow	1	50	55-70	10	1_5	17	5-10	51	50-60	26	< 10
Sandy	1	23 81	70-85	11	1-J 5-10	21	J-10 T-5	80	J0-00 40-50	20	< 20
Silty	2	71 (+ 17)	60-85	4 (+ 3)	1-5	27 (+ 11)	T-1	55 (+ 48)	40-50 50-60	, 11 (+ 11)	< 20
Thin Breaks	1	88	20-50	53	5-10	37	5-20	84	30-60	11 (± 11) 0	< 60
Miznah											
Clavnan	2	75 (+ 18)	30-50	17 (+ 11)	5-10	8 (+ 0)	2-10	47 (+ 18)	5-10	7 (+ 6)	< 40
Gravel	1	62	15-20	1, (= 11) 4	1-5	13	15-25	23	30-40	, (= 0) 15	< 10
Sands	1	72	50-60	7	5-10	1	1-3	83	40-49	3	< 20
Shallow Clav	2	59 (± 16)	20-40	5 (± 7)	1-5	_ 23 (± 12)	10-15	51 (± 14)	20-30	- 16 (± 15)	< 40
Silty	6	69 (± 13)	60-85	23 (± 12)	1-5	12 (± 6)	T-1	62 (± 24)	50-60	5 (± 5)	< 20
Shallow	1	65	15-20	8	1-5	22	15-25	14	10-15	15	< 50

	No. of plots	Avg Grass/Sedge Foliar Cover (Standard Deviation) (%)	ESD Reference Grass/Sedge Cover (%)	Avg Forbs Foliar Cover (Standard Deviation) (%)	ESD Reference Forb Cover (%)	Avg Shrub Foliar Cover (Standard Deviation) (%)	ESD Reference Shrub Cover (%)	Avg Litter Cover (Standard Deviation) (%)	ESD Reference Litter Cover (%)	Avg Bare Ground (Standard Deviation) (%)	ESD Reference Bare Ground
Plains		. /	× /	. ,				. ,		. ,	
Clayey	5	70 (± 13)	55-85	12 (± 5)	5-10	9 (± 6)	1-5	54 (± 25)	35-60	10 (± 7)	< 20
Claypan	1	75	30-50	9	5-10	8	2-10	63	5-10	9	< 40
Coarse Clay	1	75	30-50	7	1-5	7	5-10	22	15-25	14	< 50
Overflow	1	75	55-70	7	1-5	8	5-10	94	50-60	1	< 10
Sands	2	73 (± 8)	50-60	6 (± 4)	5-10	24 (± 27)	1-3	48 (± 41)	40-49	6 (± 2)	< 20
Sandy	2	100 (± 16)	70-85	5 (± 2)	5-10	28 (± 39)	T-5	73 (± 8)	40-50	2 (± 2)	< 20
Shallow Clay	7	46 (± 5)	20-40	18 (± 12)	1-5	17 (± 11)	10-15	51 (± 22)	20-30	14 (± 8)	< 40
Silty	12	77 (± 12)	60-85	21 (± 18)	1-5	17 (± 13)	T-1	69 (± 27)	50-60	5 (± 5)	< 20
Silty Steep Very	4	74 (± 25)	60-70	8 (± 5)	1-5	6 (± 4)	5-10	63 (± 14)	40-48	7 (± 5)	< 25
Shallow	1	64	15-20	11	1-5	27	15-25	25	10-15	13	< 50
Plevna											
Sandy	1	58	70-85	29	5-10	0	T-5	71	40-50	5	< 20
Silty	10	88 (± 17)	60-85	14 (± 11)	1-5	6 (± 5)	T-1	68 (± 23)	50-60	1 (± 1)	< 20
Powderville Rd											
Claypan	1	81	30-50	9	5-10	3	2-10	35	5-10	6	< 40
Silty	2	79 (± 4)	60-85	25 (± 18)	1-5	15 (± 7)	T-1	45 (± 9)	50-60	5 (± 6)	< 20
Ridge											
Clayey	2	76 (± 1)	55-85	45 (± 42)	5-10	17 (± 16)	1-5	56 (± 22)	35-60	4 (± 2)	< 20
Dense Clay	1	73	20-30	0	T-1	0	20-25	83	15-20	6	< 60

	No. of plots	Avg Grass/Sedge Foliar Cover (Standard Deviation) (%)	ESD Reference Grass/Sedge Cover (%)	Avg Forbs Foliar Cover (Standard Deviation) (%)	ESD Reference Forb Cover (%)	Avg Shrub Foliar Cover (Standard Deviation) (%)	ESD Reference Shrub Cover (%)	Avg Litter Cover (Standard Deviation) (%)	ESD Reference Litter Cover (%)	Avg Bare Ground (Standard Deviation) (%)	ESD Reference Bare Ground
Saline											
Upland	3	38 (± 25)	10-15	17 (± 24)	1-5	12 (± 11)	20-25	28 (± 27)	10-15	40 (± 26)	< 60
Shallow Clay	1	88	20-40	26	1-5	5	10-15	46	20-30	2	< 40
Silty	2	85 (± 3)	60-85	40 (± 27)	1-5	9 (± 8)	T-1	58 (± 26)	50-60	3 (± 4)	< 20
Silty Steep	1	87	60-70	45	1-5	8	5-10	52	40-48	1	< 25
Ridgeway Ridge Rd											
Clayey	2	82 (± 21)	55-85	53 (± 15)	5-10	2 (± 3)	1-5	49 (± 17)	35-60	4 (± 4)	< 20
Sandy	1	54	70-85	43	5-10	8	T-5	39	40-50	9	< 20
Rosebud											
Clayey	2	65 (± 36)	55-85	8 (± 1)	5-10	16 (± 14)	1-5	75 (± 6)	35-60	11 (± 13)	< 20
Claypan	2	77 (± 36)	30-50	22 (± 4)	5-10	12 (± 1)	2-10	47 (± 27)	5-10	4 (± 6)	< 40
Coarse Clay	1	41	30-50	11	1-5	40	5-10	53	15-25	20	< 50
Dense Clay	1	64	20-30	33	T-1	13	20-25	31	15-20	15	< 60
Overflow	2	64 (± 19)	55-70	16 (± 14)	1-5	9 (± 12)	5-10	37 (± 3)	50-60	15 (± 17)	< 10
Saline											
Lowland	1	67	40-70	9	T-5	15	5-20	45	15-25	17	< 5
Saline											
Upland	2	14 (± 15)	10-15	34 (± 24)	1-5	8 (± 6)	20-25	19 (± 11)	10-15	39 (± 26)	< 60
Shallow Clay	1	37	20-40	5	1-5	21	10-15	7	20-30	39	< 40
Silty	6	84 (± 17)	60-85	23 (± 9)	1-5	11 (± 11)	T-1	82 (± 15)	50-60	6 (± 8)	< 20
Unglaciated Clayey	1	93	55-85	39	5-10	7	1-5	84	35-60	1	< 20

	No. of plots	Avg Grass/Sedge Foliar Cover (Standard Deviation) (%)	ESD Reference Grass/Sedge Cover (%)	Avg Forbs Foliar Cover (Standard Deviation) (%)	ESD Reference Forb Cover (%)	Avg Shrub Foliar Cover (Standard Deviation) (%)	ESD Reference Shrub Cover (%)	Avg Litter Cover (Standard Deviation) (%)	ESD Reference Litter Cover (%)	Avg Bare Ground (Standard Deviation) (%)	ESD Reference Bare Ground
Claypan	1	50	30-50	13	5-10	7	2-10	57	5-10	13	< 40
Sandy	2	88 (± 36)	70-85	21 (± 11)	5-10	13 (± 5)	T-5	52 (± 28)	40-50	2 (±3)	< 20
Silty	2	63 (± 8)	60-85	6 (± 5)	1-5	13 (± 5)	T-1	25 (± 6)	50-60	15 (± 2)	< 20
Wildhorse											
Clayey	2	72 (± 17)	55-85	23 (± 2)	5-10	13 (± 4)	1-5	58 (± 26)	35-60	8 (± 6)	< 20
Overflow	2	85 (± 7)	55-70	23 (± 15)	1-5	24 (± 6)	5-10	94 (± 1)	50-60	0 (± 0)	< 10
Silty	3	80 (± 8)	60-85	10 (± 3)	1-5	8 (± 6)	T-1	71 (± 38)	50-60	6 (± 11)	< 20

Appendix E: Preferred Forbs

Table E1: GRSG Preferred Forb by Grouped ESD within Management Zone with PHMA or RHMA 2017-2020.

	BELLE CREEK	BICKERDYKE RD		CB GRAZING DIST			CEDAR CREEK	COTTONWOOD CR			CROW CREEK			DRY ARM	FINGER BUTTES		НАХВҮ			ot only	INDIAN CREEK	POWDERVILLE RD	RIDGE			RIDGEWAY RIDGE	1 PLOT ONLY	ROSEBUD			
Species	Sand/Gravel	Clay-based	Silty/Loamy	ClayBased	Saline	Silty/Loamy	ClayBased	Clay-based C	Saline	Shallow	Clay-based	Saline	Silty/Loamy	Clay-based	Clay-based	Silty/Loamy	Clay-based	Sand/Gravel	Silty/Loamy	Wet 1 pl	Clay-based	Silty/Loamy	Clay-based	Saline	Silty/Loamy	Clay-based I	RD Sand/Gravel	ClayBased	Saline	Silty/Loamy	Wet
alfalfa		х		х	х			х	x				x					x		x			x								x
annual sunflower														х	х																X
black medic		х													X								X		X						
bluebells, prairie														1			X						i –			1					
broomrape, Louisisana																		X													
buckwheat																															
fewflower														Х					Х									х			
golden								Х			X				X														X		
slenderbush																												X			
curly dock			Х	Х											X																
dandelion, common		Х	Х		X	X		Х	X	X	X			X	X	X	X	X	X		X	X	X	X	х	х	X	X	X		X
desert biscuitroot											_			X							_					Х	X	X	X		
echinacea		Х						Х			_		X		X						_	X	X				_				
flax																									_		_				
Lewis															_			X									_	_			
stiffstem				Х	X									X			X	X	X			X			_		_	X	X		
wild blue								X							_												_	_			
fleabane											_										_					_	_				
buff																															X
prairie					X										-										_						X
daisy														X			X	X					X					X			

Species	Sand/Gravel BELLE CREEK	Clay-based BICKERDYKE RD	Silty/Loamy	ClayBased CB GRAZING DIST	Saline	Silty/Loamy	ClayBased CEDAR CREEK	Clay-based COTTONWOOD CR	Saline	Shallow	Clay-based CROW CREEK	Saline	Silty/Loamy	Clay-based DRY ARM	Clay-based FINGER BUTTES	Silty/Loamy	Clay-based HAXBY	Sand/Gravel	Silty/Loamy	Wet 1 plot only	Clay-based INDIAN CREEK	Silty/Loamy POWDERVILLE RD	Clay-based RIDGE	Saline	Silty/Loamy	Clay-based RIDGEWAY RIDGE	Sand/Gravel 1 PLOT ONLY	ClayBased ROSEBUD	Saline	Silty/Loamy	Wet
goldenrod																															
Missouri						X									X			X				X	X		X						X
soft															x																
gumbo lily														-					X									X			
hairy goldenaster											X						X	X		X				X	X						X
hawksbeard, narrowleaf																	x														
Hood's phlox		Х			Х			Х	х	Х	X	Х		X	X	Х	Х	Х	X		X		X		х	х		X	X		
lambsquarter								Х																							
lettuce																															
blue								Х																				X			
prickly														X	X						X										
milkvetch																															
cream																					X										
groundplum																	X														
Missouri													X	X			X				X										
plains																		Х			X							X	X		
twogrooved								Х													X				X			X			
onion, textile	X	Х					X		Х	Х				X	X	Х	X	Х	X			X				X	X	X	X		
penstemon																															
white											X																X		X		
waxleaf							X																								
pepperweed, common		Х									Х		X	Х			Х				Х		Х								
plains springparsley																										Х					
prairie clover																															
purple		Х				Х					Х				Х			Х		Х											Х
white											Х																				Х
prostrate knotweed													X																		

Species	Sand/Gravel BELLE CREEK	Clay-based BICKERDYKE RD	Silty/Loamy	ClayBased CB GRAZING DIST	Saline	Silty/Loamy	ClayBased CEDAR CREEK	Clay-based COTTONWOOD CR RD	Saline	Shallow	Clay-based CROW CREEK	Saline	Silty/Loamy	Clay-based DRY ARM	Clay-based FINGER BUTTES	Silty/Loamy	Clay-based HAXBY	Sand/Gravel	Silty/Loamy	Wet 1 plot only	Clay-based INDIAN CREEK	Silty/Loamy POWDERVILLE RD	Clay-based RIDGE	Saline	Silty/Loamy	Clay-based RIDGEWAY RIDGE	Sand/Gravel 1 PLOT ONLY	ClayBased ROSEBUD	Saline	Silty/Loamy	Wet
pussytoes																															
field																	Х						X		Х						
littleleaf																	Х	Х										X			
low								Х							Х	Х		Х	Х	Х				Х						Х	
rosy																													Х		
small-leaf													Х					Х													
ragwort, perennial								Х							X																
rockcress																															
hairy																		Х										X		Х	
Holbell's					Х			Х							Х			Х				Х					Х				
tower														Х			Х		Х									X			
rush skeletonplant																		Х				Х									
salsify		Х	Х	Х	Х			Х			X	Х	Х	Х	Х	Х	Х	Х	Х	Х	X	Х	X	Х	Х	Х	Х	X	Х	Х	X
sagewort																															
cudweed			Х			X							Х		Х			Х	Х		X		X								
green																															
green (tarragon)		Х									X										X										
saclet gaura								x									Х		Х		Х	Х									
scarlet globemallow	Х	Х	Х	Х	Х			Х		Х	Х		Х	Х	Х	Х	Х	Х	Х	Х	Х	Х			Х			Х	Х	X	X
scurfpea																															
silverleaf	Х	Х									X		Х	Х			Х	Х			X	Х	X	Х	Х	Х	Х		Х		X
slimflower														Х																	
Indian breadroot								Х			X		Х	Х			Х					Х									
sego lily	Х				Х									Х			Х	Х	X												
smooth blue aster																												X			
sweetclover		Х	Х	Х	Х		Х	Х	Х	Х	X	Х	Х	Х		Х	Х		X			Х	X		Х	Х	Х	X			X
tansyaster																															
hoary																														Х	
rayless											X		Х															X	Х		

	vel BELLE CREEK	d BICKERDYKE RD	лу	d CB GRAZING DIST		лу	CEDAR CREEK	d COTTONWOOD CR			d CROW CREEK		h	d DRY ARM	d FINGER BUTTES	Λu	d HAXBY	vel	Λu	1 plot only	d INDIAN CREEK	ny POWDERVILLE RD	d RIDGE		Λu	d RIDGEWAY RIDGE	vel 1 PLOT ONLY	ROSEBUD		Λu	
Species	Sand/Grav	Clay-base	Silty/Loan	ClayBase	Saline	Silty/Loan	ClayBased	Clay-base	Saline	Shallow	Clay-base	Saline	Silty/Loan	Clay-base	Clay-base	Silty/Loan	Clay-base	Sand/Grav	Silty/Loan	Wet	Clay-base	Silty/Loan	Clay-base	Saline	Silty/Loan	Clay-base	Sand/Grav	ClayBased	Saline	Silty/Loan	Wet
tanseyleaf					1					1				x		-	х		-		1				-				_		-
tiny trumpet																												х			
upright prairie coneflower		x		х		x		x			x			x	x		x	x	x	x	x	x	x		x				x		x
western rockjasmine					Х							Х					Х	Х									Х				
western yarrow		Х	Х	Х	Х	Х		Х	Х	Х	Х	Х		Х		Х	Х	Х	Х		X	Х	X	Х	Х	Х	Х	Х	Х		Х
white heath aster																							X					Х			
white prairie aster																													X		
wild mint																			Х												
wildparsley							х								X																
woolly plantain	х	X	х	х				Х			X	X	х	х		X	X	X	Х	х		Х	X	X	X			X		X	X

Appendix F: Montana DEQ Water Quality and PFC determination

Table F1: Montana DEQ water quality and PFC determination for streams from the 2020 303(d) list on lands managed by BLM in the project area.

Allotment	Allotment	Water Body		Non-Point				
Number	Name	Name	Impairment	Pollution	Sources	Feet	PFC	Trend
		Pig Dry	Nitrogen, Total [CFL 1994], Phosphorus, Total [CFL 1994], Nitrate/Nitrite (Nitrite + Nitrate as N) [CFL 1994],	Alteration in stream-	Agriculture, Municipal			
00018	BIG DRY ANGUS	Creek	[CFL 2000]	vegetative covers	Discharges	10,540	FAR	Upward
00372	BILL WRIGHT	Sand Creek	Sedimentation/Siltation	Physical substrate habitat alterations	Rangeland Grazing, Crop Production (Non-Irrigated), Agriculture	345	FAR	Upward
00019		Big Dry Creek	Nitrogen, Total [CFL 1994], Phosphorus, Total [CFL 1994], Nitrate/Nitrite (Nitrite + Nitrate as N) [CFL 1994], Ammonia, Un-ionized [CFL 2000]	Alteration in stream- side or littoral	Agriculture, Municipal Point Source Discharges	3,733	FAR	Upward
	COOLEY	Big Dry	Nitrogen, Total [CFL 1994], Phosphorus, Total [CFL 1994], Nitrate/Nitrite (Nitrite + Nitrate as N) [CFL 1994], Ammonia, Un-ionized	Alteration in stream-	Agriculture, Municipal Point Source	5,755		
00071	ALLOTMENT	Creek	[CFL 2000]	vegetative covers	Discharges	11,168	FAR	Upward
00555	DAILY CREEK	Powder River	Salinity [CFL 2008]		Source Unknown, Natural Sources	253	FAR	Upward

Allotment	Allotment	Water Body		Non-Point				
Number	Name	Name	Impairment	Pollution	Sources	Feet	PFC	Trend
	DEER CREEK		Sedimentation/Siltation [CFL 1994], Dissolved Oxygen [CFL 2006], Nitrogen, Total [CFL		Rangeland Grazing, Dam or Impoundment,			
01329	AMP	Cabin Creek	1990]		Natural Sources	14,325	FAR	Upward
00303	GAY	Powder River	Salinity [CFL 2008]		Source Unknown, Natural Sources	7,835	FAR	Upward
00149	HARBAUGH	Big Dry Creek	Nitrogen, Total [CFL 1994], Phosphorus, Total [CFL 1994], Nitrate/Nitrite (Nitrite + Nitrate as N) [CFL 1994], Ammonia, Un-ionized [CFL 2000]	Alteration in stream- side or littoral	Agriculture, Municipal Point Source	867	EAD	Upward
00174	HOVERSON	Big Dry	Nitrogen, Total [CFL 1994], Phosphorus, Total [CFL 1994], Nitrate/Nitrite (Nitrite + Nitrate as N) [CFL 1994], Ammonia, Un-ionized	Alteration in stream- side or littoral	Agriculture, Municipal Point Source	148	EAD	Upward
00174	HOVERSON	Big Dry Creek	Nitrogen, Total [CFL 1994], Phosphorus, Total [CFL 1994], Nitrate/Nitrite (Nitrite + Nitrate as N) [CFL 1994], Ammonia, Un-ionized [CFL 2000]	Alteration in stream- side or littoral	Agriculture, Municipal Point Source Discharges	148	FAR	Upward
01503	MICHELETTO	Burns Creek	Nitrogen, Total [CFL 2006], Sediment [CFL 1992], Phosphorus, Total [CFL 2006], Iron [CFL 2006]	Flow Regime Modification, Chlorophyll-a, Fish Passage Barrier	Crop Production (Crop Land or Dry Land), Hydrostructure Impacts on Fish Passage, Natural Sources, Crop Production (Irrigated)	1,166	FAR	Upward

Allotmont	Alletment	Water		Non Doint				
Number	Name	Name	Impairment	Pollution	Sources	Foot	DEC	Trend
01533	SCHMITZ, RAYMOND	Charlie Creek	Specific Conductivity [CFL 1988], Nitrogen, Total [CFL 2006], Iron [CFL 2006]	Fish Passage Barrier	Natural Sources, Crop Production (Crop Land or Dry Land), Highways, Roads, Bridges, Infrastructure (New Construction)	339	FAR	Upward
10169	WEST FORTY CREEK	Mizpah Creek	Salinity [CFL 2008]		Natural Sources	6,243	FAR	Upward
01434	WILLIAMS	Powder River	Salinity [CFL 2008]		Source Unknown, Natural Sources	447	FAR	Upward
01264	WOHLGENANT LEASE	Sunday Creek	Copper [CFL 2006], Lead [CFL 2006], Nitrate/Nitrite (Nitrite + Nitrate as N) [CFL 1990], Iron [CFL 2006], Phosphorus, Total [CFL 1990], Nitrogen, Total [CFL 1990]	Physical substrate habitat alterations, Chlorophyll-a	Crop Production (Irrigated), Crop Production (Non- Irrigated), Source Unknown, Natural Sources, Rangeland Grazing	712	FAR	Upward
10142	KENDRICK	Hanging Woman Creek	Salinity [CFL 1996]	Flow Regime Modification	Crop Production (Irrigated), Natural Sources	610	FAR	Upword
10097	CIRCLE BAR	Hanging Woman Creek	Salinity [CFL 1996]	Flow Regime Modification	Crop Production (Irrigated), Natural Sources	635	FAR	Upward
01069	ALMY	Pennel Creek	Total Dissolved Solids (TDS) [CFL 1988]		Source Unknown	70	PFC	Static
01106	BICKLE INC.	Pennel Creek	Total Dissolved Solids (TDS) [CFL 1988]		Source Unknown	265	PFC	Static
01015	BRADSHAW AMP	Powder River	Salinity [CFL 1996]		Natural Sources, Source Unknown	3,293	PFC	Static

Allotment	Allotment	Water Body		Non-Point				
Number	Name	Name	Impairment	Pollution	Sources	Feet	PEC	Trend
Number		Turne			Impacts from Hydrostructure Flow Regulation/modificati on, Crop Production (Irrigated), Streambank Modifications/destabi			
10061	BRINGOFF CK.	Tongue	Iron [CFL 1996],	Flow Regime	lization, Natural	1 225	DEC	Static
	CAPROCK	Harris	Sediment [CFL 1992], Phosphorus, Total [CFL	Flow Regime Modification,	Natural Sources, Livestock (Grazing or Feeding Operations), Transfer of Water from an Outside Watershed, Grazing in Riparian or Shoreline	1,523		Static
01053	RANCH	Creek	2006]	Chlorophyll-a	Zones	1,687	PFC	Static
01640	CEDAR CREEK ALLOTMENT	Charlie Creek	Specific Conductivity [CFL 1988], Nitrogen, Total [CFL 2006], Iron [CFL 2006]	Fish Passage Barrier	Natural Sources, Crop Production (Crop Land or Dry Land), Highways, Roads, Bridges, Infrastructure (New Construction)	2,483	PFC	Static
00243	DALY	Otter Creek	Iron [CFL 1996], Salinity [CFL 1996]	Alteration in stream- side or littoral vegetative covers	Grazing in Riparian or Shoreline Zones, Natural Sources, Site Clearance (Land Development or Redevelopment), Agriculture, Highways, Roads, Bridges, Infrastructure (New Construction)	2,754	PFC	Static
		Powder			Natural Sources,			
10237	DEEP COULEE	River	Salinity [CFL 1996]		Source Unknown	1,718	PFC	Static
00262	EARLEY	Powder River	Salinity [CFL 1996]		Natural Sources, Source Unknown	665	PFC	Static

Allotment Number	Allotment Name	Water Body Name	Impairment	Non-Point Pollution	Sources	Feet	PFC	Trend
		Powder			Natural Sources,			
10165	FEASTER UNIT	River	Salinity [CFL 1996]		Source Unknown	1,953	PFC	Static
00815	FISHER	Pennel Creek	Total Dissolved Solids (TDS) [CFL 1988]		Source Unknown	8,425	PFC	Static
00815	FISHER	Pennel Creek	Total Dissolved Solids (TDS) [CFL 1988]		Source Unknown	562	PFC	Static
01468	FISHER	Pennel Creek	Total Dissolved Solids (TDS) [CFL 1988]		Source Unknown	82	PFC	Static
00588	FORTYFOUR CREEK	Powder River	Salinity [CFL 1996]		Natural Sources, Source Unknown	6,005	PFC	Static
10496	GARR UNIT	Powder River	Salinity [CFL 2008]		Source Unknown, Natural Sources	5,055	PFC	Static
10244	GASKILL	Pumpkin Creek	Salinity [CFL 1996], Temperature [CFL 1996]	Flow Regime Modification	Crop Production (Irrigated), Natural Sources	323	PFC	Static
10537	HAMILTON SCOTT	Powder River	Salinity [CFL 1996]		Natural Sources, Source Unknown	885	PFC	Static
10273	HARTMANN	Powder River	Salinity [CFL 1996]		Natural Sources, Source Unknown	1,437	PFC	Static
10189	HOME & SOMERS	Powder River	Salinity [CFL 2008]		Source Unknown, Natural Sources	7,088	PFC	Static
01450	JESS J BLANKENSHIP	Cedar Creek	Selenium [CFL 2006], Copper [CFL 2006], Lead [CFL 2006], Iron [CFL 2006]		Natural Sources	6,381	PFC	Static
10179	NINEMILE CREEK	Little Missouri River	Nitrogen, Total [CFL 2006], Cadmium [CFL 2006], Phosphorus, Total [CFL 2006], Copper [CFL 2006], Lead [CFL 2006], Zinc [CFL 2006], Iron [CFL 2006]		Agriculture, Natural Sources, Source Unknown	5,016	PFC	Static

Allotmont	Allotmont	Water		Non Point				
Allotment	Anothent	Nome	Impoint	Non-Point Dollution	Courses	Feet	DEC	Trand
Number	Name	Name	Impairment	Pollution	Sources	Feet	PFC	Trena
					Regulation (modificati			
					Regulation/modificati			
					(Irrigated)			
					(Ingaleu), Stroambank			
					Modifications/dostabi			
		Tongue	Iron [CEL 1996]	Flow Regime	lization Natural			
10097		Pivor	Sodimont [CEL 1996]	Modification	Sourcos	1	DEC	Static
10087	ROCKER SIA	River	Codmium [CEL 2006]	Woullication	Sources	1	FFC	Static
			Copper [CEL 2006] Zinc					
	THOMPSON	Thompson	[CEL 2006] Iron [CEL					
10162	CREEK	Creek	2006]		Natural Sources	6 961	PEC	Static
10102	CREEK	CICCK	2000]		Source Unknown	0,501		Static
				Alteration in stream-	Agriculture Grazing in			
	TWITCHELL	Nelson	Cadmium [CEL 2006]	side or littoral	Riparian or Shoreline			
00390	ALLOTMENT	Creek	Copper [CEL 2006]	vegetative covers	Zones	1 138	PFC	Static
	/	0.00.			Crop Production	1,100		otatio
			Sedimentation/Siltation		(Irrigated). Natural			
			[CFL 1988], pH [CFL		Sources. Source			
			1990]. Chromium. Total		Unknown, Impacts			
			[CFL 1992], Copper [CFL		from Hydrostructure			
			1992], Total Dissolved		Flow			
			Solids (TDS) [CFL 1988],		Regulation/modificati			
			Phosphorus, Total [CFL	Alteration in stream-	on, Rangeland			
			1990], Lead [CFL 1992],	side or littoral	Grazing, Streambank			
		Yellowstone	Nitrogen, Total [CFL	vegetative covers,	Modifications/destabi			
01493	WIBAUX	River	1990]	Fish Passage Barrier	lization	8,318	PFC	Static
			Sedimentation/Siltation					
			[CFL 1994], Dissolved		Rangeland Grazing,			
			Oxygen [CFL 2006],		Dam or			
			Nitrogen, Total [CFL		Impoundment,			
01356	WINDMILL AMP	Cabin Creek	1990]		Natural Sources	3,893	PFC	Static
		Powder			Natural Sources,			
10611	WL RANCH	River	Salinity [CFL 1996]		Source Unknown	3,194	PFC	Static

Allotment Number	Allotment Name	Water Body Name	Impairment	Non-Point Pollution	Sources	Feet	PFC	Trend
01560	WYMAN	Fox Creek	Nitrogen, Total [CFL 2006], Sediment [CFL 1988], Phosphorus, Total [CFL 2006], Lead [CFL 2006], Total Dissolved Solids (TDS) [CFL 1988], Mercury [CFL 2006], Sulfate [CFL 1988], Iron [CFL 2006], Arsenic [CFL 1994]	Flow Regime Modification, Physical substrate habitat alterations, Algae	Source Unknown, Channelization, Natural Sources, Crop Production (Irrigated)	1,518	PFC	Static
01069	ALMY	Pennel Creek	Total Dissolved Solids	-	Source Unknown	641	PEC	Upward
00372	BILL WRIGHT	Sand Creek	Sedimentation/Siltation [CFL 1990]	Physical substrate habitat alterations	Rangeland Grazing, Crop Production (Non-Irrigated), Agriculture	3,877	PFC	Upward
10272	BUG RANCH CO.	Little Powder River	Salinity [CFL 1996]		Natural Sources, Source Unknown	2,645	PFC	Upward
01640	CEDAR CREEK ALLOTMENT	Charlie Creek	Specific Conductivity [CFL 1988], Nitrogen, Total [CFL 2006], Iron [CFL 2006]	Fish Passage Barrier	Natural Sources, Crop Production (Crop Land or Dry Land), Highways, Roads, Bridges, Infrastructure (New Construction)	220	PFC	Upward
00622	CHERRY CREEK SHEEP	Stellar Creek	Cadmium [CFL 2006], pH [CFL 2006], Phosphorus, Total [CFL 2006]	Chlorophyll-a	Rangeland Grazing, Source Unknown	5,729	PFC	Upward
00622	CHERRY CREEK SHEEP	Stellar Creek	Cadmium [CFL 2006], pH [CFL 2006], Phosphorus, Total [CFL 2006]	Chlorophyll-a	Rangeland Grazing, Source Unknown	8,584	PFC	Upward
01091	ED MAY UNIT	Sandstone Creek	Nitrogen, Total [CFL 2006], Nitrate/Nitrite (Nitrite + Nitrate as N) [CFL 2006]		Municipal Point Source Discharges, Agriculture	6,202	PFC	Upward

Allotment	Allotment	Water Body	Impairment	Non-Point	Sources	Foot	DEC	Trend
Number	Name	Powder	Inpannent	Foliation	Natural Sources	гееі	FFC	Trenu
00264	EDWARDS	River	Salinity [CFL 1996]		Source Unknown	643	PFC	Upward
		Pennel	Total Dissolved Solids					
01468	FISHER	Creek	(TDS) [CFL 1988]		Source Unknown	216	PFC	Upward
00329	FLETCHER UNIT	Little Porcupine Creek	Nitrate/Nitrite (Nitrite + Nitrate as N) [CFL 1990], Total Dissolved Solids (TDS) [CFL 1990], Phosphorus, Total [CFL 1990], Nitrogen, Total [CFL 1990]	Chlorophyll-a	Rangeland Grazing, Source Unknown	6,862	PFC	Upward
10286	FOSTER	Little Missouri River	Nitrogen, Total [CFL 2006], Cadmium [CFL 2006], Phosphorus, Total [CFL 2006], Copper [CFL 2006], Lead [CFL 2006], Zinc [CFL 2006], Iron [CFL 2006]		Agriculture, Natural Sources, Source Unknown	35	PFC	Upward
10200	TOSTER	Miznah	2000]		CHRIGWI	55	110	opwaru
01056	HALL	Creek	Salinity [CFL 2008]		Natural Sources	1,678	PFC	Upward
01056	HALL	Mizpah Creek	Salinity [CFL 2008]		Natural Sources	4,306	PFC	Upward
10320	HALL	Mizpah Creek	Salinity [CFL 2008]		Natural Sources	182	PFC	Upward
03399	HAY DRAW	Little Missouri River	Nitrogen, Total [CFL 2006], Cadmium [CFL 2006], Phosphorus, Total [CFL 2006], Copper [CFL 2006], Lead [CFL 2006], Zinc [CFL 2006], Iron [CFL 2006]		Agriculture, Natural Sources, Source Unknown	2,258	PFC	Upward
			Selenium [CFL 2006], Copper [CFL 2006], Lead					
01484	HERIGSTAD	Cedar Creek	2006]		Natural Sources	4,234	PFC	Upward

Allotment	Allotment	Water Body	Impairment	Non-Point	Sources	East	DEC	Trond
10393	LAWRENCE	Little Missouri River	Nitrogen, Total [CFL 2006], Cadmium [CFL 2006], Phosphorus, Total [CFL 2006], Copper [CFL 2006], Lead [CFL 2006], Zinc [CFL 2006], Iron [CFL 2006]	Poliution	Agriculture, Natural Sources, Source Unknown	46	PFC	Upward
10369	MARKOS	Powder River	Salinity [CFL 1996]		Natural Sources, Source Unknown	885	PFC	Upward
		Tongue	Iron [CFL 1996],	Flow Regime	Impacts from Hydrostructure Flow Regulation/modificati on, Crop Production (Irrigated), Streambank Modifications/destabi lization, Natural			
00086	MITCHELL	River	Sediment [CFL 1996]	Modification	Sources	29	PFC	Upward
00694	NEMITZ/WIBAUX COUNTY	Cabin Creek	CFL 1994], Dissolved Oxygen [CFL 2006], Nitrogen, Total [CFL 1990]		Rangeland Grazing, Dam or Impoundment, Natural Sources	739	PFC	Upward
01109	OSTENDORF	Powder River	Salinity [CFL 1996]		Natural Sources, Source Unknown	1.309	PFC	Upward
00478	RIVER	East Redwater Creek	Sedimentation/Siltation [CFL 1992]	Chlorophyll-a	Agriculture, Source Unknown	758	PFC	Upward
01009	SANDSTONE CREEK UNIT	Sandstone Creek	Nitrogen, Total [CFL 2006], Nitrate/Nitrite (Nitrite + Nitrate as N) [CFL 2006]		Municipal Point Source Discharges, Agriculture	7,041	PFC	Upward
01009	SANDSTONE CREEK UNIT	Sandstone Creek	Nitrogen, Total [CFL 2006], Nitrate/Nitrite (Nitrite + Nitrate as N) [CFL 2006]		Municipal Point Source Discharges, Agriculture	1,291	PFC	Upward

Allotment	Allotment	Water Body Name	Impairment	Non-Point Pollution	Sources	Feet	PEC	Trend
			Sedimentation/Siltation [CFL 1988], pH [CFL 1990], Chromium, Total [CFL 1992], Copper [CFL 1992], Total Dissolved Solids (TDS) [CFL 1988], Phosphorus, Total [CFL 1990], Lead [CFL 1992],	Alteration in stream- side or littoral	Crop Production (Irrigated), Natural Sources, Source Unknown, Impacts from Hydrostructure Flow Regulation/modificati on, Rangeland Grazing, Streambank			
01547	SORENSON	Yellowstone River	Nitrogen, Total [CFL 1990]	vegetative covers, Fish Passage Barrier	Modifications/destabi	271	PFC	Upward
10105	VASSAU	East Fork Armells Creek Fast	Nitrogen, Total [CFL 1994], Aluminum [CFL 2018], Iron [CFL 2018], Phosphorus, Total [CFL 2018], Specific Conductivity [CFL 1990], Nitrate/Nitrite (Nitrite + Nitrate as N) [CFL 1994], Total Dissolved Solids (TDS) [CFL 1990]	Alteration in stream- side or littoral vegetative covers, Habitat Alterations	Natural Sources, Transfer of Water from an Outside Watershed, Agriculture, Coal Mining, Source Unknown, Grazing in Riparian or Shoreline Zones	2,046	PFC	Upward
01510	VERGULOOT	Redwater	Sedimentation/Siltation		Agriculture, Source		550	
01519	TRIANGLE ELEVEN	Creek Mizpah Creek	[CFL 1992] Salinity [CFL 2008]	Chlorophyll-a	Unknown Natural Sources	1,078	PFC	Upward Upward
01142	GUMBO	Harris Creek	Sediment [CFL 1992], Phosphorus, Total [CFL 2006]	Flow Regime Modification, Chlorophyll-a	Natural Sources, Livestock (Grazing or Feeding Operations), Transfer of Water from an Outside Watershed, Grazing in Riparian or Shoreline Zones	2,192	PFC	Upward