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

Pumpkin Creek Management Plan
Preliminary Environmental Assessment

Miles City Field Office

111 Garryowen Rd

Miles City, MT 59301

Pumpkin Creek Management Plan

Preliminary Environmental Assessment

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1 Introduction

1.0 Summary of Proposed Project

The Pumpkin Creek Allotment contains approximately 19,498 acres of public lands administered by the BLM. There are also two sections of land owned by the State of Montana within the boundary of the Pumpkin Creek Allotment (Township 6 North; Range 48 East, Sections 16 and 36) (Map 1 in Appendix E). The BLM acquired the Pumpkin Creek Allotment through a land exchange completed in 2009. As a result of the land exchange, these acquired lands do not have an entity with a priority position to receive a grazing permit. The Pumpkin Creek Allotment has been identified in the 2015 Miles City Field Office Approved Resource Management Plan, as amended (MCFO ARMP) as available for livestock grazing.

In 2014, concurrent with development of the MCFO ARMP, the MCFO involved the Eastern Montana Resource Advisory Council (RAC) to solicit public input and develop objectives to guide management of the Pumpkin Creek Allotment. The MCFO used the RAC-developed objectives to incorporate objectives into a Notice of Available Forage and prepared an Environmental Assessment (EA) to assign grazing preference to the Pumpkin Creek Allotment. A Notice of Proposed Decision was issued on May 25, 2017 assigning preference to one permittee. This decision was protested, and the BLM addressed the points of protest and issued a Notice of Final Decision on September 18, 2017.

The Final Decision was appealed resulting in an Office of Hearings and Appeals (OHA) order to cancel the Final Decision authorizing grazing on the Pumpkin Creek Allotment. The order required the BLM to consider all relevant information and conduct additional analysis and issue a new decision prior to December 1, 2020. That order was subsequently appealed to the Interior Board of Land Appeals (IBLA). While the appeal remained pending, the BLM and the appellant reached a stipulated settlement agreement. The stipulation allowed for the remand of the Final Decision and deferred the vacatur to February 22, 2021. The settlement agreement also stipulated that cancellation of the Final Decision and related permit would be deferred until February 1, 2022 if BLM does not issue a new decision by December 1, 2020. The IBLA referred the case back to the OHA which issued an order affirming the stipulated settlement agreement on January 17, 2020.

Consequently, the BLM has prepared this EA to address the availability of forage and develop management alternatives for the Pumpkin Creek Allotment.

1.1 Location

The Pumpkin Creek Allotment is located approximately 17 miles south of Miles City, Montana in Custer County. The allotment lies within T5N R48E and T5N R49E. See Map 1 in Appendix E for specific sections.

1.2 Purpose and Need

The MCFO ARMP designates lands within the Pumpkin Creek Allotment as available for livestock grazing in accordance with resource objectives. The BLM's purpose for this action is to

develop a management plan that addresses the availability of forage, that is in conformance with the Memorandum of Understanding (MOU) between BLM, Montana Fish, Wildlife and Parks (MTFWP), and Pheasants Forever (PF), and that meets resource objectives identified in the MCFO ARMP. Specific resource objectives are:

- Improve riparian and wetland areas toward Proper Functioning Condition (PFC) or a higher ecological status;
- Protect water resources from point source and nonpoint source pollution;
- Provide plant communities that reflect the potential natural community or the desired plant community appropriate for the ecological site;
- Meet rangeland health objectives by using Guidelines for livestock grazing management, such as grazing use, grazing activity plans and systems, range improvements, and vegetation treatments;
- Implement habitat improvements to restore or improve unsatisfactory or declining fish, aquatic and wildlife habitat and enhance plant communities and habitat needed to maintain or restore fish, aquatic and wildlife populations;
- Minimize fragmentation of large intact blocks of important wildlife habitat; and,
- Protect Historic Properties from adverse effects related to the available forage decision.

1.3 Decision to be Made

This EA provides the information needed for the authorized officer, the Miles City Field Manager, to decide whether or not to graze the Pumpkin Creek Allotment, and if so the terms and conditions that would apply for grazing.

If an alternative is selected that allows for one or more permittees, a grazing permit or permits would be issued in a Proposed Decision. The process for taking applications, qualifying applicants, and processing conflicting applications would be identified in a Notice of Available Forage. Selecting an applicant and awarding preference is not part of this National Environmental Policy Act (NEPA) process; however, the Proposed Decision would identify the permittee(s).

1.4 Land Use Plan Conformance

This proposal is in conformance with the Miles City ARMP Record of Decision approved in 2015, which incorporated the Standards for Rangeland Health and Guidelines for Livestock Grazing for Montana, North Dakota, and South Dakota Record of Decision approved in 1997. Specifically, the proposal is in conformance with MD Pumpkin 3: The Pumpkin Creek Allotment 10509 (formerly known as the Rogers Allotment), is available for livestock grazing in accordance with resource objectives (page 3-20 of the MCFO ARMP).

1.5 Relationship to Statutes, Regulations, Other NEPA Documents

The preparation of this environmental assessment will follow guidelines according to regulations adopted by the Council of Environmental Quality (CEQ) found in 40 CFR Part 1500-1508, and the BLM NEPA Handbook H-1790-1 and policies regarding the implementation of NEPA and compliance with CEQ regulations.

- National Environmental Policy Act (NEPA) of 1969 (Pub. L 91-190; 42 U.S.C. 4321 et seq.)
- Taylor Grazing Act of June 28, 1934, as amended (43 U.S.C. 315 through 315r)
- The Public Rangelands Improvement Act of 1978 (43 U.S.C. 1901, et seq.)
- Federal Land Policy and Management Act (FLPMA) of 1976, as amended (Pub. L. 940579); 90 Stat.2743; 43 U.S.C. 1701 et seq.)
- 43 CFR 4100 Grazing Administration
- Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et seq.)
- Section 106 of the National Historic Preservation Act (NHPA), 1966, as amended
- Standards for Rangeland Health and Guidelines for Livestock Grazing Management
- Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-712)

1.6 Issues Identified for Analysis

Scoping is the process the BLM uses to request input from internal (BLM interdisciplinary team (IDT)) and external (public) sources to identify issues related to the proposal and potential alternatives to be addressed in this Environmental Assessment as well as the extent of analysis necessary for an informed decision. The scoping period for this project began on March 9, 2020 and concluded on March 23, 2020. On March 9, 2020, the BLM published public notice on the national NEPA Register (BLM ePlanning) website, social media (BLM Facebook page), and in the following newspapers: *Billings Gazette, Great Falls Tribune, Glendive Ranger, Sidney Herald,* and others (see Table 1 in Appendix F).

The BLM received six (6) comments submitted online through the ePlanning website and four (4) comments in hard copy format. The BLM IDT developed alternatives and design features to address issues raised during the scoping process. See Table 2 in Appendix F for all issues and alternatives brought up during the scoping process. Some issues were identified for detailed analysis which are the focus in Chapter 3 of this EA. The issues identified for detailed analysis for this project are:

1.6.1 *Issue 1 – How would livestock grazing affect upland health and vegetation in the Pumpkin Creek Allotment?*

1.6.2 *Issue 2 – How would the alternatives addressing the available forage affect Socioeconomics?*

1.6.3 *Issue 3 – How would the alternatives addressing the available forage affect Historic Properties?*

1.6.4 *Issue 4– How would the alternatives addressing the available forage affect the nesting and brood rearing habitat for upland and riparian bird species, including grouse?*

1.6.5 *Issue 5 – How would the alternatives addressing the available forage affect riparian and wetland areas?*

1.6.6 *Issue 6 – How would the alternatives addressing the available forage affect water resources?*

1.6.7 *Issue 7 – How would the alternatives addressing the available forage affect fish and aquatic species' habitat?*

1.6.8 *Issue 8 – How would the alternatives addressing the available forage affect soil erosion?*

1.7 Issues Identified but Eliminated from Further Analysis

Issues identified through scoping that are addressed by design features for this project (see section 2.2) or are beyond the scope of this project were considered but are not analyzed in detail in this EA. The following list includes issues that were considered but are not analyzed in detail along with a short rationale for BLM's decision to eliminate from further analysis. See Table 2 in Appendix F for all issues and alternatives brought up during the scoping process.

1.7.1 *How would paleontological resources be impacted by livestock grazing?*

The Pumpkin Creek Allotment is dominated by a Potential Fossil Yield Classification (PFYC) 4 geologic formation. The Geologic Formation is the Tullock Member of the Fort Union Formation and covers approximately 10,435 acres of the 19,498 acres in the Pumpkin Creek Allotment. Liggett (2020) describes the formation as having potential for significant vertebrate and plant fossils in localized deposits. However, there are no known significant fossil localities within the project area. Generally, paleontological resources are not impacted by disperse cattle grazing. In addition. due to the lack of identified paleontological sites this issue has been eliminated from detailed analysis.

1.7.2 *How would crucial big game winter range be impacted by livestock grazing?*

There are approximately 605 acres of identified Big Game Crucial Winter Range (BGCWR) within the Pumpkin Creek allotment, 80 percent of which is located on State land (485 acres).

There are approximately 10,200 acres of BGCWR in the general vicinity (10 miles) of the allotment; this means that the alternatives would only affect about 4.8 percent of the available BGCWR within the general vicinity. The allotment is expected to continue to meet standards and guides and utilization levels at or below 50 percent. Any change in vegetation composition as a result of livestock distribution is expected to have no effect on big game as their forage during winter months seldom overlap, with mule deer primarily utilizing shrubs, woody vines and trees. No alternative includes surface disturbing activities which may result in avoidance behavior as a result of anthropogenic disturbance. No alternative would authorize additional fencing which would minimize fragmentation of important wildlife habitat. Additionally, all gates would be left open in pastures when no grazing is occurring to minimize obstacles to movement. This issue has been considered and eliminated from further analysis.

1.7.3 *How would Recreation be impacted by livestock grazing?*

A portion of the Pumpkin Creek allotment is managed as an Extensive Recreation Management Area (ERMA). This Pumpkin Creek ERMA is part of the North, Middle, and Double Crossing pastures located on the north and east side of Highway 59. An ERMA is managed to support and sustain principal recreational activities and opportunities associated with those activities. Currently, there are no developed amenities available within the Pumpkin Creek ERMA.

Under the No Action alternative there would be no grazing within the ERMA. Under design features common to all Action Alternatives, grazing would only be allowed in the North, Middle, and Double Crossing pastures on a prescriptive basis (Section 2.1). If prescriptive grazing is allowed, experiences and benefit impacts to the recreation user would depend on type of recreational activity and individual user.

The remaining pastures within the Pumpkin Creek Allotment, west of Highway 59, are not specifically managed to enhance or maintain identified desired recreational settings, experiences, or beneficial outcomes. This area would be managed to meet only basic Recreation and Visitor Service needs. The west side of the Pumpkin Creek Allotment provides a variety of dispersed recreation opportunities for a self-directed experience. No amenities exist on the west side of the allotment and there are no site-specific recreation regulations in place. Relevant existing regulations still apply and include the 16-day overnight stay limit and all others related to public use and occupancy.

Grazing within the Pumpkin Creek allotment to the west of Highway 59 would still allow for public access to BLM administered lands. Dispersed recreational use would continue under all grazing alternatives. Any change in grazing pattern or rest rotation system would still allow for recreationists to use the public land with grazing or, if they prefer, to use a pasture nearby without grazing occurring at that specific time. There would not be any substantial changes to recreation opportunity or experience as a result of the implementation of any of the action alternatives. Different design features such as variation in timing and season of use within each alternative allows for certain recreational activities to continue without interference from grazing if that happens to be limiting for a specific recreationist (See Table 2 in Appendix F).

Recreational users have utilized the Pumpkin Creek Allotment with and without grazing. The

Pumpkin Creek Allotment has been grazed by cattle in 2014, 2017, 2018 and 2019, therefore, recreational users have become better accustomed to them in the project area. Within those years, the recreation planner has received very few and only minor complaints, none related specifically to grazing. Individual experiences for recreational users would depend on the type of dispersed recreational activity the user is participating in and the individual recreational user, and would be the same for all alternatives.

With the Pumpkin Creek Allotment remaining accessible to all recreational users; dispersed recreation being allowed under all alternatives; and experiences to recreationists dependent on the type of recreational activity and on the individual users for all alternatives; this issue has been considered and eliminated from further analysis.

2 Alternatives

Each of the following alternatives describe a specific grazing plan that, if selected, would be used to manage the Pumpkin Creek Allotment. The grazing plans vary by alternative depending on the type of authorization proposed in that alternative (renewable or non-renewable permit) and the number of permits that would be issued under that alternative. If a grazing permit or permits are issued, livestock grazing would be authorized in accordance with a specific management plan or plans (depending on the selected alternative) and would identify Animal Unit Months (AUMs) of permitted use. An Animal Unit Month means the amount of forage necessary for the sustenance of one cow or its equivalent for a period of one month. The term is further defined as "a month's use and occupancy of range by one cow, bull, steer, heifer. . . over the age of 6 months at the time of entering the public lands or other lands administered by Bureau of land Management. . ." An Animal Unit (A.U.) includes a cow and her calf if under 6 months when it enters public lands.

2.0 Features Common to All Alternatives

The following design features are considered in the impact analysis for all Alternatives in Chapter 3:

- Cooperative restoration efforts with MT Fish, Wildlife, and Parks (MTFWP) and Pheasants Forever (PF) to improve wildlife habitat along and adjacent to Pumpkin Creek along with restoration efforts by BLM to restore riparian habitat along Pumpkin Creek would continue in the future.
- The public lands in the project area would continue to be monitored according to the Miles City Field Office (MCFO) monitoring schedules and Greater Sage Grouse (GRSG) Monitoring Framework. There are currently 11 established upland monitoring sites, 12 cross sections along Pumpkin Creek to monitor stream geomorphology, and four fish and habitat monitoring sites from which data are collected and analyzed at established intervals to ensure Land Health Standards and habitat objectives are met, which enable the BLM to make a timely response to changed conditions.
- Visual design considerations would be incorporated into all surface disturbing projects regardless of size or potential impact. The contrast rating process would be used as a visual design and project assessment tool.

2.1 Features Common to All Action Alternatives

The following design features are considered in the impact analysis for all Action Alternatives in Chapter 3. These design features would be applied to minimize impacts from the implementation of the selected alternative:

- The AUMs in the North, Middle, and Double Crossing pastures (425) would not be authorized with the rest of the allotment. These AUMs would only be grazed on a prescriptive basis with free use permits for specific vegetation treatments. Prescriptive grazing is a type of grazing designed to manage vegetation to meet specific resource objectives other than production of livestock forage. This type of grazing would typically be very short in duration, limited to specific locations, and require a specific number of

livestock. Grazing on a prescriptive basis would ensure the timing, length of grazing period and number of livestock are consistent with meeting resource objectives such as restoring and maintaining the woody and herbaceous riparian communities along Pumpkin Creek. Grazing on a prescriptive basis would also allow the BLM to comply with the MOU between the BLM, MTFWP, and PF to ensure the terms and conditions of the Upland Game Bird Enhancement Program (UGBEP) contract are being met. The AUMs used by prescriptive use in these pastures are not included with the AUMs available in pastures on the west side of Highway 59.

- Only cow/calf pairs, yearling cattle and bulls would be authorized to graze the Pumpkin Creek Allotment.
- Supplemental feed (including salting) would not be placed within one quarter mile of stock watering facilities, riparian zones, hardwood draws or wetlands. (Supplemental feed is defined as feed that provides for improved livestock nutrition or rangeland management but does not replace forage available from public lands.) The placement of supplements must be approved in advance.
- Site specific protection measures such as but not limited to, construction of temporary or permanent physical barriers, formal testing and/or data recovery may be required for Historic Properties under this alternative.
- Range improvements projects would be repaired and maintained to BLM specifications prior to turnout each year. Any maintenance activity related to grazing or implementing the selected grazing plan must remain within existing disturbance and follow BMP's referenced in Appendix N of the MCFO ARMP.
- Gates would be left open when livestock are not present.
- Prior authorization is required for motorized administrative use off established roads and trails.
- Permittee would record animal numbers and move dates and submit an Actual Use Report which is due no later than 15 days after the grazing season has ended.
- Changes in the grazing season or numbers of livestock, etc. due to drought, fire, water system failure, etc. would be made on an as-needed basis after coordination and approval from the BLM authorized officer.

2.2 Alternative 1 - No Action Alternative

Currently there is a permittee grazing the Pumpkin Creek Allotment that was assigned the grazing preference from a previous decision. However, that decision was appealed resulting in an order for the current permittee to vacate and the decision remanded back to the BLM for new analysis (See Section 1.0). The BLM and the appellant (current permittee) reached a stipulated settlement agreement allowing for the vacatur to be deferred to February 22, 2021, the end of the grazing season while the BLM conducts new analysis. The stipulated settlement agreement also allowed for the current grazing system to remain in place for one more grazing season if the BLM does not reach a new decision by December 1, 2020. Therefore, the latest date the current grazing system could remain in place is February 1, 2022. Thus, the existing management that would continue if the No Action is selected would be no grazing. Subsequently, the reference point or baseline for comparing environmental effects of each Action Alternative is No Grazing.

2.3 Alternative 2 – One Grazing Authorization for the Pumpkin Creek Allotment

Total AUMs (Animal Use Months) available would be 2,552. The class of livestock would be limited to cattle (cow/calf pairs, yearlings, or bulls). All nine pastures west of Hwy 59 would be included in a rest rotation grazing system. Nine grazing-resting treatments would be utilized meaning one pasture would be rested each year and eight pastures would receive grazing at some point during the season. The season of use would be from May 1 to October 10. A herd of up to 378 cattle animal units (A.U.) would graze through the scheduled available pastures each year. The number of days animals would be in a pasture would be determined by that pasture's grazing capacity. Note: The AUMs available does not equate to the AUMs used each year due to resting a pasture each year. See grazing rotation schedule in Appendix G, Section 12.0.

Under Alternative 2, the permit would be issued with the following terms and conditions:

Grazing Authorization Alt 2

Allotment Name & Number	Livestock Number	Livestock Kind	Grazing Begin	Period End	%PL	Type Use	AUMs
Pumpkin Creek # 10509	476	C	05/01	10/10	100	Active	2,551
	1	C	05/01	06/01	100	Active	1

Total Active AUMs: 2,552

Terms and Conditions:
A herd size of 378 animal units (A.U.) will be grazed in a rest rotation grazing system with 9 pastures and 9 treatments. One pasture will be rested every year. Eight pastures will be grazed every year. Grazing will be in accordance with DOI-BLM-MT-C020-2020-0040-EA, Appendix G, Section 12.0.

Permittee will record animal numbers and move dates and submit an Actual Use Report which is due no later than 15 days after the grazing season has ended.

Range improvements projects will be repaired and maintained to BLM specifications prior to turnout each year.

Gates will be left open when livestock are not present.

Prior authorization is required for motorized administrative use off of established roads and trails.

Supplemental feed (including salting) will not be placed within one quarter mile of stock watering facilities, riparian zones, hardwood draws or wetlands. Supplemental feed is defined as feed that provides for improved livestock nutrition or rangeland management but does not replace forage available from public lands. Placement of supplements must be approved in advance.

Changes in the grazing season or numbers of livestock, etc. due to drought, fire, water system failure, etc. will be made on an as-needed basis after coordination and approval from the BLM authorized officer.

Line 2 on the grazing schedule is to authorize the full preference.

2.4 Alternative 3 – Two Grazing Authorizations for the Pumpkin Creek Allotment

The Pumpkin Creek Allotment would be divided to accommodate two term grazing permits. This would provide economic opportunity for two entities instead of just one. Two separate grazing systems would be implemented on the pastures west of Highway 59, one for each grazing authorization. The class of livestock would be limited to cattle (cow/calf pairs, yearlings, or bulls) on both grazing authorizations.

First Grazing Authorization:
The total available forage in the first grazing authorization is 1,726 AUMs. This grazing rotation would involve the Dry Creek Pasture, Dry Divide Pasture, Pine Hill Pasture, and Jack Divide Pasture. A four-pasture rest rotation grazing system would be implemented. Four grazing treatments would be utilized. One pasture would be rested each year. The season of use would be May 15 to October 1. A herd of up to 261 cattle A.U. would graze through the scheduled available pastures each year. The number of days animals would be in a pasture would be determined by that pasture's grazing capacity. Note: The AUMs available does not equate to the AUMs used each year due to resting a pasture each year. See grazing rotation schedule in Appendix G, Section 12.1.1.

Under Alternative 3, the permit for Authorization 1 would be issued with the following terms and conditions:

Grazing Authorization 1 for Alt 3

Allotment Name & Number	Livestock Number	Livestock Kind	Grazing Begin	Period End	%PL	Type Use	AUMs
Pumpkin Creek # 10509	375	C	05/15	10/01	100	Active	1726

Total Active AUMs: 1,726

Terms and Conditions:
A herd size of 261 animal units (A.U.) will be grazed in a rest rotation grazing system with 4 pastures and 4 treatments. One pasture will be rested every year. Three pastures will be grazed every year. Grazing will be in accordance with DOI-BLM-MT-C020-2020-0040-EA, Appendix G, Section 12.1.1.

Permittee will record animal numbers and move dates and submit an Actual Use Report which is due no later than 15 days after the grazing season has ended.

Range improvements projects will be repaired and maintained to BLM specifications prior to turnout each year.

Gates will be left open when livestock are not present.

Prior authorization is required for motorized administrative use off of established roads and trails.

Supplemental feed (including salting) will not be placed within one quarter mile of stock watering facilities, riparian zones, hardwood draws or wetlands. Supplemental feed is defined as feed that provides for improved livestock nutrition or rangeland management but does not replace forage available from public lands. Placement of supplements must be approved in advance.

Changes in the grazing season or numbers of livestock, etc. due to drought, fire, water system failure, etc. will be made on an as-needed basis after coordination and approval from the BLM authorized officer.

Second Grazing Authorization:
The total available forage in the second grazing authorization is 826 AUMs. This second grazing rotation would involve the Upper Prat Creek Pasture, Two Wells Pasture, Old Corral Pasture et al, West Ridge/Well Pasture, and Artesian Pasture. A five-pasture rest rotation grazing system would be implemented. Five grazing treatments would be utilized. One pasture would be rested each year. The season of use would be May 15 to October 1. A herd of up to 128 cattle A.U. would graze through the scheduled available pastures each year. The number of days animals would be in a pasture would be determined by that pasture's grazing capacity. Note: The AUMs available does not equate to the AUMs used each year due to resting a pasture each year. See grazing rotation schedule in Appendix G, Section 12.1.2.

Under Alternative 3, the permit for Authorization 2 would be issued with the following terms and conditions:

Grazing Authorization 2 for Alt 3

Allotment Name & Number	Livestock Number	Livestock Kind	Grazing Begin	Period End	%PL	Type Use	AUMs
Pumpkin Creek # 10509	179	C	05/15	10/01	100	Active	824
	1	C	05/15	07/15	100	Active	2

Total Active AUMs: 826

Terms and Conditions:
A herd size of 128 animal units (A.U.) will be grazed in a rest rotation grazing system with 5 pastures and 5 treatments. One pasture will be rested every year. Four pastures will be grazed every year. Grazing will be in accordance with DOI-BLM-MT-C020-2020-0040-EA, Appendix G, Section 12.1.2.

Permittee will record animal numbers and move dates and submit an Actual Use Report which is due no later than 15 days after the grazing season has ended.

Range improvements projects will be repaired and maintained to BLM specifications prior to turnout each year.

Gates will be left open when livestock are not present.

Prior authorization is required for motorized administrative use off of established roads and trails.

Supplemental feed (including salting) will not be placed within one quarter mile of stock watering facilities, riparian zones, hardwood draws or wetlands. Supplemental feed is defined as feed that provides for improved livestock nutrition or rangeland management but does not replace forage available from public lands. Placement of supplements must be approved in advance.

Changes in the grazing season or numbers of livestock, etc. due to drought, fire, water system failure, etc. will be made on an as-needed basis after coordination and approval from the BLM authorized officer.

Line 2 on the grazing schedule is to authorize the full preference.

2.5 Alternative 4 – Designate the Pumpkin Creek Allotment as a Reserve Common Allotment (RCA)

The total available forage in this alternative is 2,552 AUMs. Approximately one half of the RCA would be grazed annually either in a 3-pasture deferred rotation (1,430 AUMs available in the Dry Divide, Pine Hill and Jack Divide pastures) or in a 6-pasture deferred rotation (1,122 AUMs available in the Dry Creek, Artesian, Well/West Ridge, Old Corral et al, Two Wells and Upper Prat Creek pastures). Year to year use would alternate between the 3-pasture system and the 6-pasture system. In the event of an emergency (e.g. wildfire), the rested portion of the RCA would be available for grazing to permittees affected by the emergency, dependent on resource needs being achieved in accordance with Appendix H. Resource needs would dictate how often these rest pastures would be available. Use dates would be limited to be between May 1 to October 1. A temporary non-renewable grazing authorization (current year's bill) would be issued to selected permittees. Note: The AUMs available does not equate to the AUMs used each year due to pastures being rested. Fence maintenance would be the responsibility of the selected permittee(s). BLM would be responsible for the maintenance and repair of water developments. See grazing rotation schedule in Appendix G, Section 12.2. See Appendix H for the process for authorizing temporary non-renewable permits.

Under Alternative 4, the non-renewable permit(s) would be issued with the following terms and conditions:

Temporary Non-Renewable Grazing Authorization:

Allotment Name & Number	Livestock Number	Livestock Kind	Grazing Begin	Period End	%PL	Type Use	AUMs
Pumpkin Creek # 10509	282	C	05/01	10/01	10/01	Active	1428
	1	C	05/01	07/01	10/01	Active	2

Total Active AUMs: 1,430

Terms and Conditions:
A herd size of up to 282 animal units (A.U.) will be grazed in a deferred rotation grazing system with 3 pastures and 3 treatments. Following is the number of days of grazing that would be available in each pasture using 282 A. U. Grazing will be in accordance with DOI-BLM-MT-C020-2020-0040-EA, Appendix G, Section 12.2.

Pasture	#of days
Dry Divide Pasture	54
Pine Hill Pasture	56
Jack Divide Pasture	43

Permittee will record animal numbers and move dates and submit an Actual Use Report which is due no later than 15 days after the grazing season has ended.

Fence projects will be repaired and maintained to BLM specifications prior to turnout each year.

Gates will be left open when livestock are not present.

Prior authorization is required for motorized administrative use off of established roads and trails.

Supplemental feed (including salting) will not be placed within one quarter mile of stock watering facilities, riparian zones, hardwood draws or wetlands. Supplemental feed is defined as feed that provides for improved livestock nutrition or rangeland management but does not replace forage available from public lands. Placement of supplements must be approved in advance.

Changes in the grazing season or numbers of livestock, etc. due to drought, fire, water system failure, etc. will be made on an as-needed basis after coordination and approval from the BLM authorized officer.

Line 2 on the grazing schedule is to authorize the full preference.

ON ALTERNATE YEARS:

Temporary Non-Renewable Grazing Authorization:

Allotment Name	Livestock	Livestock	Grazing	Period	%PL	Type	AUMs

& Number	Number	Kind	Begin	End		Use	
Pumpkin Creek # 10509	221	C	05/01	10/01	10/01	Active	1119
	1	C	05/01	08/01	10/01	Active	3

Total Active AUMs: 1,122

A herd size of up to 221 animal units (A.U.) will be grazed in a deferred rotation grazing system with 6 pastures and 6 treatments. Following is the number of days of grazing that would be available in each pasture using 221 A. U. Grazing will be in accordance with DOI-BLM-MT-C020-2020-0040-EA, Appendix G, Section 12.2.

Pasture	#of days
Upper Prat Pasture	32
Two Wells Pasture	24
Old Corral, et al Pasture	20
Well/West Ridge Pasture	20
Artesian Pasture	17
Dry Creek Pasture	41

Permittee will record animal numbers and move dates and submit an Actual Use Report which is due no later than 15 days after the grazing season has ended.

Fences will be repaired and maintained to BLM specifications prior to turnout each year.

Gates will be left open when livestock are not present.

Prior authorization is required for motorized administrative use off of established roads and trails.

Supplemental feed (including salting) will not be placed within one quarter mile of stock watering facilities, riparian zones, hardwood draws or wetlands. Supplemental feed is defined as feed that provides for improved livestock nutrition or rangeland management but does not replace forage available from public lands. Placement of supplements must be approved in advance.

Changes in the grazing season or numbers of livestock, etc. due to drought, fire, water system failure, etc. will be made on an as-needed basis after coordination and approval from the BLM authorized officer.

Line 2 on the grazing schedule is to authorize the full preference.

2.6 Alternative 5 – Separate Allotment into a Reserve Common Allotment and One Grazing Authorization

Reserve Common Allotment (RCA)

A three-pasture rest rotation grazing system would be implemented in the Reserve Common Allotment pastures. Those pastures involve the Dry Divide Pasture, Pine Hill Pasture and Jack Divide Pasture. Three grazing treatments would be utilized. One pasture would be rested each year. The rest treatment would be followed by a deferred treatment. The season of use would be May 15 to October 1. A total of 196 cattle A.U. (cow/calf pairs, yearlings, or bulls) would graze through the scheduled available pastures. The number of days animals would be in a pasture would be determined by that pasture's grazing capacity. Note: The AUMs available does not equate to the AUMs used each year due to resting a pasture each year. Fence maintenance would be the responsibility of the selected permittee. BLM would be responsible for the maintenance and repair of water developments. See grazing rotation schedule in Appendix G, Section 12.3.1.

Under Alternative 5, the permit for the RCA would be issued with the following terms and conditions:

RCA - Temporary Non-Renewable Grazing Authorization

Allotment Name & Number	Livestock Number	Livestock Kind	Grazing Begin	Period End	%PL	Type Use	AUMs
Pumpkin Creek # 10509	310	C	05/15	10/01	100	Active	1427
	1	C	05/15	08/15	100	Active	3

Total Active AUMs: 1,430

Terms and Conditions:
A herd size of up to 196 animal units (A.U.) will be grazed in a rest rotation grazing system with 3 pastures and 3 treatments. One pasture will be rested every year. Two pastures will be grazed every year. Grazing will be in accordance with DOI-BLM-MT-C020-2020-0040-EA, Appendix G, Section 12.3.1.

Permittee will record animal numbers and move dates and submit an Actual Use Report which is due no later than 15 days after the grazing season has ended.

Fences will be repaired and maintained to BLM specifications prior to turnout each year.

Gates will be left open when livestock are not present.

Supplemental feed (including salting) will not be placed within one quarter mile of stock watering facilities, riparian zones, hardwood draws or wetlands. Supplemental feed is defined as feed that provides for improved livestock nutrition or rangeland management but does not replace forage available from public lands. Placement of supplements must be approved in advance.

Changes in the grazing season or numbers of livestock, etc. due to drought, fire, water system failure, etc. will be made on an as-needed basis after coordination and approval from the BLM authorized officer.

Line 2 on the grazing schedule is to authorize the full preference.

One Grazing Authorization
The grazing authorization would use a 6-pasture rest rotation grazing system and would involve the Upper Prat Creek Pasture, Two Wells Pasture, Old Corral Pasture et al, West Ridge/Well Pasture, Artesian Pasture, and Dry Creek Pasture. Six grazing treatments would be utilized. One pasture would be rested each year. The season of use would be May 15 to October 1. A total of 179 cattle A.U. (including bulls) would graze through the scheduled available pastures each year. The number of days animals would be in a pasture would be determined by that pasture's grazing capacity. Note: The AUMs available does not equate to the AUMs used each year. See grazing rotation schedule in Appendix G, Section 12.3.2.

Under Alternative 5, the permit would be issued with the following terms and conditions:

Grazing Authorization for 6 pasture rest rotation

Allotment Name & Number	Livestock Number	Livestock Kind	Grazing Begin	Period End	%PL	Type Use	AUMs
Pumpkin Creek # 10509	243	C	05/15	10/01	100	Active	1118
	1	C	05/15	09/15	100	Active	4

Total Active AUMs: 1,122

Terms and Conditions:

A herd size of 179 animal units (A.U.) will be grazed in a rest rotation grazing system with 6 pastures and 6 treatments. One pasture will be rested every year. Five pastures will be grazed every year. Grazing will be in accordance with DOI-BLM-MT-C020-2020-0040-EA, Appendix G, Section 12.3.2.

Permittee will record animal numbers and move dates and submit an Actual Use Report which is due no later than 15 days after the grazing season has ended.

Range improvements projects will be repaired and maintained to BLM specifications prior to turnout each year.

Gates will be left open when livestock are not present.

Prior authorization is required for motorized administrative use off of established roads and trails.

Supplemental feed (including salting) will not be placed within one quarter mile of stock watering facilities, riparian zones, hardwood draws or wetlands. Supplemental feed is defined as feed that provides for improved livestock nutrition or rangeland management but does not replace forage available from public lands. Placement of supplements must be approved in advance.

Changes in the grazing season or numbers of livestock, etc. due to drought, fire, water system failure, etc. will be made on an as-needed basis after coordination and approval from the BLM authorized officer.

Line 2 on the grazing schedule is to authorize the full preference.

2.7 Alternatives Considered but not Analyzed in Detail

The following are alternatives, or portions of alternatives that were considered buy not analyzed in detail.

2.7.1 *Grazing the area east of Hwy 59 (North, Middle, and Double Crossing pastures) other than on a prescriptive basis.*

Grazing the area east of Highway 59 (North, Middle, and Double Crossing pastures) would not be feasible due to the restoration activities ongoing in this area.

To continue stream restoration objectives (improve channel form, regain access to floodplain, enhance riparian vegetation) to improve and restore declining fish, aquatic and wildlife habitat in and adjacent to Pumpkin Creek, the entire length of the creek would need to be fenced to remove the pressure and stressors of cattle grazing (Magilligan and McDowell 1997, Batchelor et al. 2015). Pumpkin Creek is currently in a degraded state, structurally starved and incised. Once riparian-wetland areas exceed a functional threshold, they can persist in a degraded state for decades to centuries. Both passive (no grazing) and active restoration are often needed accelerate and sustain the healing process. A cooperative habitat improvement project is underway on the North and Middle pastures with MTFWP and PF (DOI-BLM-MT-C020-2012-0192-EA). To uphold the terms of the UGBEP contract, all the restoration units would have to be fenced out from grazing for a period of ten years. Each unit will have a ten-year term, which begins when the restoration work begins on that unit (Map 3 in Appendix E). Each of these units (23 units total, approximately 630 acres) would need to be fenced out from grazing. Adding the amount of fencing needed to fence out all 23 restoration units, Pumpkin Creek, and all riparian and wetland areas would not meet other resource objectives such as wildlife (minimize wildlife habitat fragmentation) and Recreation (meet extensive recreation management objectives).

Given the requirements of the restoration plans, the BLM has determined that grazing would not be feasible on this portion of the allotment (North, Middle, and Double Crossing pastures) on a rotational basis included with any of the Action Alternatives. Therefore, the forage available would be utilized on a prescriptive basis for any vegetation treatments that may be needed to complement the restoration projects that are being done by MTFWP and PF in the North and Middle pastures and restoration projects by the BLM in the North, Middle, and Double Crossing pastures.

2.7.2 *Including sheep as livestock, either separately or mixed with cattle*

Scoping comments requested the BLM consider running sheep concurrently with cattle to

enhance the vegetation as cattle would primarily browse grasses and sheep would browse forbs and sheep would bond with the herd of cattle eliminating the need for sheep tight fencing.

While grazing sheep and cattle on the same pastures can have beneficial impacts to the rangeland due to the different diet preferences, implementation of running sheep would be infeasible given the resources and uses in the area. Given that sheep may require different facilities than cattle, and this allotment was not grazed with sheep historically, there may be a need for modifications to or additional facilities, such as watering facilities and fencing, in order to run sheep on the allotment. Sheep have a much lower profile than cattle and depending on the current watering facilities in the allotment, there may need to be separate tanks for sheep to utilize. Boundary fences at a minimum would need to be replaced with sheep tight fencing because information on sheep bonding and staying with a cattle herd is speculative. Replacing boundary fencing with sheep tight fencing would not meet our wildlife objectives as sheep tight fencing is not wildlife friendly. Predation is still an issue with sheep, even when mixed with a cattle herd, so the use of a guard dog or would be probable. If sheep guard dogs are not well trained, they could cause an issue with recreation as this allotment is a popular area for dispersed recreational use and includes activities such as walking, hiking, dog walking, etc.

2.7.3 *Including Bison as livestock*

Bison permits in the Miles City Field Office constitute less than 0.4 percent of the current field office authorizations. This office has not received an application to run bison for over 10 years and there are no known potential applications. No local or adjacent bison handling facilities exist near Pumpkin Creek. The nearest bison authorization is approximately 60 miles away.

Due to the proximity to Miles City, public access from two state highways, and the amount of public use the allotment receives, there is concern that curious members of the public would approach bison. Signage could be erected, but the novelty of bison would attract members of the public seeking a photo opportunity. Bison are typically accustomed to large expanses of unconfined space when compared to traditional domestic livestock (cows and sheep). Bison unaccustomed to human interaction, not unlike other animals, can perceive you as a threat and aggressively defend their family and territory, therefore posing a larger safety risk to public users.

2.8 Table 1: Comparison of Alternatives

Components of Each Alternative	**Alternative 1 No Action/No Grazing**	**Alternative 2 One Grazing Authorization**	**Alternative 3 Two Grazing Authorizations**	**Alternative 4 RCA**	**Alternative 5 Partial RCA, Partial authorization (one)**
Season of Use	No Use	May 1 to Oct 10	May 15 to Oct 1	May 1 to Oct 1	May 15 to Oct 1
Grazing system	No Grazing	9 pasture rest rotation	Allotment split into two separate grazing systems. A 4-	Alternate between a 3-pasture deferred rotation and a	Allotment split into two separate grazing systems. A 3-

Components of Each Alternative	Alternative 1 No Action/No Grazing	Alternative 2 One Grazing Authorization	Alternative 3 Two Grazing Authorizations	Alternative 4 RCA	Alternative 5 Partial RCA, Partial authorization (one)
			pasture rest rotation and a 5-pasture rest rotation	6-pasture deferred rotation yearly	pasture rest rotation and a 6-pasture rest rotation
Rested Pastures	All	One pasture rested per year; each pasture rested once every nine years	Two pastures rested per year. • Within the 4-pasture group each pasture is rested once every 4 years. • Within the 5-pasture group each pasture is rested once every 5 years.	Alternate yearly – 3 pastures rested for one year then 6 pastures rested for one year*	Two pastures rested per year. • Within the 3-pasture group each pasture is rested once every 3 years. • Within the 6-pasture group each pasture rested once every 6 years.
Grazing Authorizations	None	One Preference Permit	Two Preference Permits	One or Multiple Temporary non-renewable Permit(s)	One Temporary non-renewable Permit and One Preference Permit
Pastures available for emergency use or available for vegetation treatments	None	None	None	6 pastures available (3 pastures on alternative years). Could accommodate up to two herds	3 pastures available. Could accommodate one herd.

* In the event of an emergency (e.g. wildfire) the rested pastures would be made available to those affected by the emergency to utilize.

3 Affected Environment and Environmental Consequences

3.0 General Setting

The Pumpkin Creek Allotment has 19,498 acres of public lands and two (2) sections of State of Montana lands. The Pumpkin Creek Allotment has 12 pastures; nine are located west of Highway 59 and three are located east of Highway 59. The allotment is primarily made up of uplands including grass and shrublands typical of the Northern Great Plains. It also contains approximately eight stream miles of Pumpkin Creek and a few associated tributaries and reservoir margins that contain riparian vegetation typical for prairie streams in eastern Montana (Map 1 in Appendix E).

3.1 Resource Issue 1 – Upland Health and Vegetation

3.1.1 *Affected Environment*

Upland vegetation consists of native grass/Wyoming big sagebrush mix. Based on upland monitoring observations, dominant herbaceous species include western wheatgrass, bluebunch wheatgrass, prairie junegrass, blue gramma, needle-and-thread, green needlegrass, threadleaf sedge, buffalo grass, and Japanese brome when precipitation factors are favorable. Generally, the forb component on all the upland transects is light, but common forbs include prickly pear cactus, fringed sagewort, western salsify, scarlet globemallow, and common dandelion. The dominant shrub is Wyoming big sagebrush, although on some sites, greasewood is the dominant shrub. Silver sagebrush is also present on the allotment.

There are eight active trend transects to monitor upland vegetative conditions on Pumpkin Creek. These transects are located on representative ecological sites such as silty, shallow, and clayey (10-14" precipitation zone). Two transects are located in the Dry Creek Pasture. Two transects are located in the Pine Hill Pasture. Two transects are located in the Jack Divide Pasture. One transect is located in the Dry Divide Pasture. One transect is located in the Two Wells Pasture. Two transects were established in 1986 and the remaining transects were established in 1989. Around this same time period, the operator entered into the Rogers Ranch Allotment Management Plan with the BLM and also entered into a Soil Conservation Service Great Plains Contract to address rangeland conditions across the ranch. Range improvement projects such as water development and fencing occurred at this time. A deferred rotation grazing system was implemented. Grazing continued under that plan until 2007. Portions of the allotment were grazed in 2008 and 2009. The land exchange was completed in 2009. Grazing did not occur on the allotment from 2010 to 2017 except for a grazing authorization in 2014. Since transect establishment, a common observation across the area is the decrease in annual bromes and increase in western wheatgrass readings. A few transects have shown an increase in Wyoming big sagebrush. The native vegetative component, litter component, and bare ground component have all remained very stable throughout the years.

The 2011 Standards for Rangeland Health Assessment selected five representative sites (different than the upland monitoring locations) on the Pumpkin Creek Allotment, previously known as the Rogers Allotment. These sites were representative of ecological sites in the area, but different than the trend monitoring sites. Three sites were on silty ecological sites (10-14"

precipitation zone). One site was on a silty steep site and the last site was on sandy ecological site (both 10-14" precipitation zone). Two of the three silty sites rated in late seral ecological condition. One silty site rated in mid seral ecological condition. All three sites saw some degree of biotic integrity departure from what was expected for a silty site. There were slight to moderate departures observed related to functional/structural groups present. Desirable cool season bunchgrasses were notably absent on the mid seral site. All three sites had a 'none to slight' departure in relation to soil and site stability and hydrologic function. The silty steep ecological site rated in late seral ecological condition. Biotic integrity for this site had some departure from reference areas in that invasive plants (Japanese brome) were common throughout the site. Soil and site stability and Hydrologic function indicators had a 'none to slight departure from what was expected for the site. The sandy ecological site rated in late seral ecological condition. There were 'none to slight' departures for soil and site stability and hydrologic function. Biotic integrity indicators had 'none to slight' departures with the exception of one indicator addressing functional/structural groups. The documentation notes that warm season grass species were notably absent from the plant community. Vegetation was vigorous on all sites and reproductive capability was not inhibited. Recent monitoring reflects a decrease in the Japanese brome component. Improvement in apparent trend has been observed. For more discussion on rangeland health attributes: soil/site stability, hydrologic function, and biotic integrity, please see Technical Reference 1734-6, Interpreting Indicators of Rangeland Health.

Overall, vegetative conditions across the allotment are similar to those expected for the respective ecological sites. However, there is evidence that historic grazing practices, livestock congregation areas (such as near reservoirs and old feed grounds) and the expansion and contraction of prairie dog towns have affected the current vegetative composition and production in some areas.

Invasive species present on the Pumpkin Creek Allotment include cheatgrass, Japanese brome, Canada thistle, leafy spurge, and salt cedar. Most infestations are small and isolated with the exception of cheatgrass and Japanese brome patches scattered throughout the area. "Brome is often abundant when autumn precipitation is high, spring precipitation is high after a dry fall and winter, and distribution is adequately uniform to allow the soil to remain wet for 3 to 5 days (Haferkamp et al. 2001 b). Although annual brome populations are heavily influenced by precipitation timing and distribution, monitoring transects have shown a decreasing trend in annual bromes. New leafy spurge infestations are a continual threat. Existing known infestations of spurge and other noxious weeds have been treated according to the MCFO integrated weed management plan.

3.1.2 *Environmental Effects —No-Action Alternative*

Existing species composition, diversity and spatial patterns would continue in the short term. Long term exclusion of grazing would impact vegetation composition, as this area was developed in conjunction with grazing animals. Plant stagnation would reduce plant vigor leading to a change in plant composition over time. Accumulated vegetation poses an increased wildfire hazard Wildfire would temporarily reduce vegetative cover. Longer lasting wildfire effects would include alternating vegetative composition favoring early establishing species and annual exotics such as cheatgrass and reduction or elimination of Wyoming big sagebrush across potentially large areas for many years.

3.1.3 *Environmental Effects—Alternative 2*

This alternative would implement a nine-pasture rest rotation grazing system. This alternative would provide growing season rest which is essential for desirable perennial vegetation's maintenance and growth. The longest grazing period in a pasture is 42 days. Limiting the days animals are in a pasture limits the selective re-grazing of preferred plants, which can be damaging by reducing the plant's food reserves. While not mandatory nor necessary on all grazing allotments, Miles City Grazing Guidelines for Livestock Grazing Management can assist in maintaining desired rangeland conditions. Miles City Guideline #5 says: *Frequency of grazing and extent of defoliations will be managed to promote desired plants and plant communities, based on the rate and physiological conditions of the plant growth. To meet these plant growth considerations, the following could be applied: No grazing unit should be grazed for more than half the growing season of key plant species.* (Montana/Dakota Standards for Rangeland Health and Guidelines for Livestock Grazing Management Aug 1997). Key plant species are indicators of desired range conditions and can include the most palatable forage plants for livestock. Natural Resources Conservation Service (NRCS) Prescribed Grazing Specification MT 528-1 also says: No field should be grazed for more than 45 days or for half the growing season if the growing season is less than 90 days. This provides for plant recovery and reduces selective re-grazing of preferred plants. Generally cool season plants actively grow during April, May, June and warm season during May, June & July. (NRCS, MT 2018). The proposed rest rotation system would allow abundant residual vegetation to remain on the ground protecting the soil surface from wind and water erosion. This rest rotation is designed so that the rest treatment promotes seedling establishment and is followed by deferred treatments so that livestock would trample seed into the soil. (Hormay 1970).

Utilization of herbaceous biomass by livestock would promote tillering of native rhizomatous grass species and increase nutrient cycling by increasing contact of manure and litter with the soil surface. This speeds decomposition and organic buildup of soil, thereby increasing soil productivity over time. Herbivory would initiate rhizomatous grass response to grazing by tillering which increases soils stability and resilience to invasive species invasion. Using livestock to treat vegetation in grazing adapted ecosystems like the Northern Great Plains would help maintain rangeland resiliency to major disturbance events such as severe wildfire or drought. All units would be expected to continue to meet the upland vegetation standard (#4) and upland plant diversity standard (#5) portions of the standards for rangeland health under this alternative.

Livestock can be vectors in weed spread. However, weed establishment is more difficult in a resilient rangeland setting. The proposed rest rotation grazing system would maintain healthy vegetation minimizing bare soil available for weed establishment.

3.1.4 *Environmental Effects—Alternative 3*

This alternative would implement two rest-rotation grazing systems. One four-pasture rest-rotation grazing system and one five-pasture rest rotation grazing system. The longest grazing period in the four-pasture rest rotation system is 61 days. The length of grazing in a pasture is

over the recommended guideline of 45 days. The longer grazing length would give opportunity for selective re-grazing of preferred plants and reduce the plant's food reserves, leading to plant damage. The rest-rotation system would provide for a year of rest followed by a deferred treatment which would promote seedling establishment and survival, however.

The longest grazing period in the five-pasture rest rotation system is 55 days. Again, the length of grazing in a pasture is over the recommended guideline of 45 days. The longer grazing length would give opportunity for selective re-grazing of preferred plants and reduce the plant's food reserves, leading to plant damage. The rest treatment followed by a deferred treatment every five years would promote seedling establishment and survival, however.

3.1.5 *Environmental Effects—Alternative 4*

This alternative would designate the Pumpkin Creek Allotment as a Reserve Common Allotment (RCA). Two grazing systems would be implemented. A three-pasture deferred rotation would be alternated with a six-pasture deferred rotation. The portion of the allotment that is not scheduled to be grazed would be rested but would be available in an emergency wildfire situation. The three-pasture deferred rotation would have grazing periods of 44 to 56 days, but would be rested every other year, unless grazed in the event of a wildfire. The grazing length in a pasture is over the recommended 45 days, which could lead to selective re-grazing of preferred plants. However, resting every other year (unless a wildfire necessitated the grazing of the rested portion of the RCA) combined with the deferred rotation would promote plant recovery.

The six-pasture deferred rotation would have grazing periods of 17 to 41 days. The length of grazing period in a pasture is within the 45-day guideline. The deferred rotation would allow adequate plant recovery.

3.1.6 *Environmental Effects—Alternative 5*

Alternative 5 would implement a three-pasture rest rotation in a Reserve Common Allotment. The longest grazing period would be 81 days. The length of grazing in a pasture is over the recommended guideline of 45 days. The longer grazing length would give opportunity for selective re-grazing of preferred plants and reduce the plant's food reserves, leading to plant damage. The rest rotation system would provide for a year of rest followed by a deferred treatment which would promote seedling establishment and survival, however.

The longest grazing period in the six-pasture rest rotation would be 50 days. This is slightly over the 45-day guideline. The rest rotation system would provide for a year of rest followed by a deferred treatment which would promote seedling establishment and survival

3.1.7 *Cumulative Effects*

Additional water sources or fences (or removal of fences) may need to be evaluated if current water developments restrict the ability to run a rest or deferred rotation due to seasonal water shortages, especially in the heat of the summer.

Historical and ongoing activities within Pumpkin Creek are similar to those of the ARMP planning area that have affected or are currently affecting vegetation communities. These include energy and mineral development, livestock grazing, on and off-highway vehicle use, recreation, infrastructure development, fire suppression, fuels management, forestry, urbanization, invasive weed infestations, pollutants, and agriculture. These impacts are expected to continue into the future. The cumulative effects of such activities have directly or indirectly contributed to increased shift of native plant community size, distribution, and risk of invasion or expansion of invasive species and alteration of wildfire dynamics. Currently, the BLM is not aware of any other reasonably foreseeable future actions, other than those discussed above.

3.2 Resource Issue 2 – Socioeconomics

3.2.1 *Affected Environment*

In terms of potential socioeconomic effects, the affected environment includes the residents, agricultural operations and businesses located in Custer County, MT.

Certain existing demographic and economic features influence and define the nature of local economic and social activity. Long-held customs, social cohesion, and history of an area provide valuable insight into how events or changes to the area may affect the livelihood and quality of life of the residents.

The Pumpkin Creek Allotment is located in Custer County, Montana, a rural community with an estimated total population of 11,845 residents (U.S. Census Bureau 2018). The per capita personal income in 2014 for Custer County was $40,126 (U.S. Bureau of Economic Analysis 2015a) while the median household income was $47,493 (U.S. Census Bureau 2015). Environmental Justice populations are not disproportionally represented in the population. The racial makeup and ethnicity of Custer County, MT's population is discussed in the Miles City ARMP (2015), as amended. Current population estimates for Custer County, MT (U.S. Census Bureau 2018) do not show a significant change in the county's racial makeup and ethnicity when compared to the statistics used in the Miles City ARMP and the population analysis presented in that document remains valid for the purposed of this Proposed Action.

More information on the socioeconomics of the area is available in the Miles City RMP FEIS (2015). The affected environment discussed here focuses on the agriculture/grazing aspects of Custer County, Montana.

In 2017 there were 441 farms in Custer County covering approximately 2.1 million acres (NASS 2019). There is considerable diversity in the size of these farms. The average farm size in 2017 was 4,737 acres and there were 172 farms at least 1,000 acres in size; however, one-half of all of the farms in Custer County were 600 acres or less (NASS 2019).

In 2017 Custer County farm operations had inventories of 90,952 cattle and calves and ranked sixth among Montana counties in cattle and calves livestock inventory (NASS 2019). Between 2012 and 2017 livestock inventories dropped 20 percent (NASS 2014, 2019).

The vast majority of grazing taking place in Custer County is on private land. At an example of 10 AUMs per head, cattle operations would require 900,000 AUMs to support their inventory. In 2020 the Miles City FO has a total of 14,252 AUMs authorized in Custer County, MT.

The value of Custer County's agricultural sales in 2017 was $76.6 million, the large majority of this (85%) attributed to cattle and calf sales (NASS 2019). Average total sales per farm in 2017 were $174,000, with 39 percent of these farms earning less than $100,000 from crop and livestock sales while 138 farms (31% of the total) earning $100,000 or more in sales (NASS 2019). Total farm sales fell 30 percent in 2017 compared to the 2012 survey (NASS 2019 – income).

While farm and ranch operations are important to the county's residents, the USDA's Economic Research Service (ERS) does not classify Custer County as having an economic dependency upon the farming industry (ERS 2015), meaning that on average, this industry represented less than 25 percent of the total earnings generated within the county and less than 16 percent of average annual employment. The ERS finds that several of the surrounding counties (Garfield, Powder River, Prairie and Wibaux) did reach this criterion, while the other neighboring counties (Fallon and Rosebud) were economically dependent upon the mining industry. It should be noted that although Custer County as a whole may not meet ERS criteria for being farming dependent, it is likely that there are communities within Custer County whose local economies are more heavily dependent upon agriculture.

The most recent BEA data for 2018 shows there were 470 full- and part-time jobs in farming in Custer County, representing six percent of total employment. Of the 2,106 business proprietors in the county, 16 percent (340) were farm owners (BEA 2018). There are also a large number of farm workers in Custer County (523) who do not collect a wage (USDA 2019). This group likely represents the farm owners and their families.

Various types of beef cattle operations exist such as cow/calf operations, stocker operations, and feedlots, each of which can impact the local economies differently due to the costs and needs associated with the operation. BLM's management decision most likely affects cow/calf operations, stocker (yearling) operations, or a combination thereof (such as a cow/calf-yearling) via grazing on public lands. Generally a cow/calf operation maintains a cow herd, replacement heifers, and some bulls year-round while most calves are sold at weaning, generally in the fall, although some yearlings may be sold in early spring (Eisele, Ritten, Bastian, and Paisley 2011). Stocker operations generally purchase weaned cattle in the spring, graze the cattle through the summer and market them in the fall (Ruff, Peck, Bastian, and Cook 2014a). Major costs associated with cow/calf operations include winter feeding, spring calving, cattle transportation, grazing, and replacement cows/heifers and bulls (Eisele, Ritten, Bastian, and Paisley 2011; Ruff, Peck, Bastian, and Cook 2014b; Eborn, Gunn, and Harrison 2016). Major costs associated with stocker operations include purchasing calves, cattle transportation, grazing, and marketing (Ruff, Peck, Bastian, and Cook 2014a; Eborn, Harrison and Rimbey 2016). Stocker operations tend not to maintain cattle over the late fall through early spring months and therefore would not have associated winter feeding costs (Ruff, Peck, Bastian, and Cook 2014a). Purchases, such as fencing materials and feed, occurring within the local area contributes to the local economy.

Also, cow/calf operations tend to require more labor overall and hire year-round labor from within the local area.

The BLM collects annual grazing fees from operators based on the number of AUMs they are permitted. For calculating the fee, an AUM is defined as a month's use and occupancy of range by one (1) cow, bull, steer, heifer, horse, burro, mule, five (5) sheep, or five (5) goats, over the age of 6 months at the time of entering the public lands, weaned animals of any age; and by such animals that would become 12 months of age during the authorized period of use. Animals under 6 months of age, at the time of entering public lands and are natural progeny of animals for which fees are paid and do not become 12 months of age during the authorized period of use and progeny born during the authorized period of use are not charged.

Livestock grazing on BLM managed allotments can involve Section 3 grazing permits (grazing on public lands within grazing districts designated by the Taylor Grazing Act), Section 15 grazing leases (grazing on public lands outside of grazing districts designated by the Taylor Grazing Act), and grazing on land acquired under the Bankhead Jones Land Utilization Act. On public domain lands, 50 percent of revenues from Section 15 grazing fees are distributed to the state and in Montana the state then reallocates all of it back to the counties in which the fees originated; 12.5 percent of grazing fees from Section 3 permits are distributed to the state and counties. On lands acquired under the Bankhead-Jones Land Utilization Act, 25 percent of revenues from both Section 3 and Section 15 lands are distributed to the counties.

Grazing on Federal lands is considerably cheaper per AUM (cow/calf pair) ($1.35 in 2020) than grazing on lands owned by the State of Montana ($12.92) and both are less expensive than average grazing fees on private Montana land (around $26.50 per month) (NASS 2018, Montana Ag Statistics 2017). Recent estimates show rental prices for Montana pasture lands increasing by an average of 3 percent per year (NASS Quickstats 2020) but year-to-year changes may vary. At the county level average rental prices can increase or decrease from year to year due to such factors as the availability of forage (drought) and/or parcels offered for rent.

The value of cattle grazing in a specific area can be estimated based on the actual grazing use of the area in AUMs and the value of an AUM. For a cow/calf operation the average value of an AUM can be estimated using data on the value of cattle production per bred cow and dividing by 16 (Workman 1986).

The alternatives affect the socioeconomic characteristics of the affected area proportional to the AUMs made available under each alternative. The lessee chosen would earn additional revenue from production on the Federal lease, and some of the lessee’s spending to support this additional production would become additional revenue to Custer County businesses and individuals.

See *Analytic Assumptions Used in This Economic Analysis in Appendix I* for more information.

3.2.2 *Environmental Impacts – No Action Alternative*

Existing economic activity attributable to management and use of Pumpkin Creek would continue. This would include some local spending and additional labor to maintain exterior

boundary fences and prevent livestock trespass. There could possibly be additional spending by recreationists who need or prefer sites where livestock are never present, but this value is uncertain.

Existing permittees would continue to utilize the available Federal grazing and their production would continue to contribute to the Custer County economy. In 2020 this grazing represented 14,252 AUMs. At the time when the current Pumpkin Creek permit is vacated (in 2021 or 2022) this total would decrease by 2,847 AUMs to a total of 11,405. If the permit is vacated in 2022 and the production does not shift to non-Federal grazing, it would represent a permanent reduction of $3,872 ($2020) in annual Federal lease payments and $115,360 ($2020) in average annual cattle production.

There would be no additional costs of supporting production, including project maintenance on water developments and fencing, to Custer County producers. BLM would prioritize maintenance of allotment boundary fencing to alleviate potential livestock trespass from adjoining lands.

3.2.3 *Environmental Impacts – Alternative 2*

Use would be as described in Alternative 2. See Appendix I for details on how these estimates were calculated. Estimates of the value of rental and lease payments and production values are reported as present values. For example, "$2,000 ($2020)" would mean the equivalent of $2,000 received in the year 2020).

Over the course of a 10-year lease, the availability of the 2,001-2,072 AUMs would generate on average $2,950 per year in Federal lease payments and over the course of this lease Federal lease payments would total $29,503 ($2020).

Annual livestock production in Custer County would increase by 2001-2027 AUMs per year based upon the grazing plan (Appendix G). The inflation-adjusted present value of producing a cow-calf pair in 2015-2019 averaged $643.06. Since 2010 annual real production value per AUM have ranged from $36.48 to $47.06 but the 10-year price trend is essentially flat. Over a 10-year lease starting in 2020 average annual production on the parcel would be $81,984 per year and total production over the lease would be $820,000.

Relative to the No-Action Alternative, in the same time frame total Federal lease payments would be $21,759 greater and total animal production would be $589,121 larger.

Additional costs of supporting production, including project maintenance on water developments and fencing, would be assigned to the permittee upon permit issuance.

3.2.4 *Environmental Impacts – Alternative 3*

Two authorizations would be issued. Use would be as described in Alternative 3. See Appendix I for details on how these estimates were calculated. Compared to the No Action Alternative there would be additional workload costs of monitoring livestock pasture moves and resource

conditions. These costs would likely be higher than those under a single authorization.

Using the methodology described in Alternative 2, actual AUMs in the first authorization would average 1,202 each year and 589 AUMs each year on the second authorization. Federal lease payments under this Alternative would average $2,611 ($2020) and over a 10-year lease these Federal payments would total $26,107.

Over a 10-year lease starting in 2020 Authorizations 1 and 2 would generate an average of $72,587 per year ($2020) in additional cattle production and the total value of additional livestock production over a 10-year lease would be $725,869 ($2020).

Relative to the No-Action Alternative, over the same time-period total Federal lease payments would be $18,363 greater and total animal production would be $495,149 larger.

Additional costs of supporting production, including project maintenance on water developments and fencing, would be assigned to the two permittees upon issuance of permits.

3.2.5 *Environmental Impacts – Alternative 4*

The Pumpkin Creek Allotment would be designated a Reserve Common Allotment. Use would be described as in Alternative 4. See Appendix I for details on how these estimates were calculated. Relative to the No Action Alternative there would be additional administrative costs associated with selecting applications and coordinating grazing on the RCA. These costs would also likely be higher than those for a single term authorization grazing permit.

Using the methodology described in Alternative 2, actual AUMs would alternate between 1,430 and 1,122 each year. Federal lease payments under this Alternative would average $1,859 ($2020) per year and over a 10-year lease beginning in 2020 these Federal lease payments would total $18,586 ($2020).

Using the methodology described in Alterative 2, assuming there were no wildfire-induced needs the alternating 1,430 and 1,122 AUMs each year would generate an average of $51,729 per year ($2020) in additional livestock production and over a 10-year lease starting in 2020 the total value of this additional production would be worth $517,290 ($2020).

Relative to the No-Action Alternative, over the same time period total Federal lease payments would be $10,842 greater and total animal production would be $509,546 larger.

As designed, an adverse event such as a wildfire could lead to all of the active AUMs being used. Assuming that the wildfire destroyed Custer County pasture that otherwise would have been in use, and that the otherwise resting pasture could tolerate emergency grazing without altering the planned rotation, it is unclear if this type of event would support any additional livestock production above that from livestock on the site. Instead, this emergency grazing could prevent a loss of up to 1,430 AUMs and $51,729 ($2020) in Custer County livestock production in that post-wildfire year.

Additional costs of supporting production, including fence maintenance, would be assigned to the RCA permittee upon nonrenewable permit issuance. BLM would be responsible for maintenance of water developments in the RCA. This would require additional cost to contract needed maintenance annually and throughout the grazing season.

3.2.6 *Environmental Impacts – Alternative 5*

Use would be as described in Alternative 5. See Appendix I for details on how these estimates were calculated. Relative to the No Action Alternative there would be additional administrative costs associated with selecting applications and coordinating grazing on the RCA. These costs would also likely be greater than those associated with administering a term authorization grazing permit.

With 1,727 actual AUMs used each year, over a 10-year lease beginning in 2020, the Federal lease payments under this Alternative would generate an average of $2,376 ($2020) per year in Federal revenue and over 10 years Federal revenues would total $23,763 ($2020).

The production of additional livestock due to these AUMs would generate $70,013 ($2020) per year and over the course of a 10-year lease starting in 2020 the present value of this production would be $700,126.

Relative to the No-Action Alternative, over the same time period total Federal lease payments would be $16,019 greater and total animal production would be $692,382 larger.

As designed, a wildfire event may lead to all of the active AUMs being used. Assuming that the wildfire destroyed Custer County pasture that otherwise would have been in use, and that the otherwise resting pasture could tolerate emergency grazing without altering the planned rotation, it is unclear if this type of event would support any additional livestock production. Instead, using the case of Artesian pasture made available for emergency grazing in its resting year, this emergency pasturing could prevent a loss of up to $11,617 ($2019) in Custer County livestock production and Federal lease revenue in that post-wildfire year.

Additional costs of supporting production, including fence maintenance, would be assigned to the RCA permittee upon nonrenewable permit issuance. BLM would be responsible for maintenance of water developments in the RCA. This would require additional cost to contract needed maintenance annually and throughout the grazing season.

Additional costs of supporting production, including fence and water development maintenance, would be assigned to the permittee upon permit issuance for the non-RCA part of the allotment.

3.2.7 *Table 2. Summary of Economic Effects of Alternatives*

	Alternative 1 No Action/No Grazing	**Alternative 2 One Grazing Authorization**	**Alternative 3 Two Grazing Authorizations**	**Alternative 4 RCA**	**Alternative 5 Partial RCA, Partial authorization (one)**
Additional AUMs per Year	(2020-21) 0 (2022-29) -2,847	2,001-2,072	1,791	1,122-1,430	1,727
Fed Lease Revenue over 10 Years ($2020)	$7,744	$29,503	$26,107	$18,586	$223,763
Value of Additional Livestock Production over 10 Years ($2020)	$230,720	$819,840	$725,869	$517,290	$700,126
Potential Production Value Saved by One Year of Emergency Grazing ($2020)				e.g. 1,430 Acres Avail: $1,931 (Lease) +$51,729 (Prod) =$53,660	e.g. Artesian Pasture Avail: $404 (Lease) +$11,213 (Prod) = $11,617
Additional BLM Costs[1]	Lowest management costs.	Management cost greater relative to No Action Alt.	Mgt costs greater than No Action and Alts 2,4,5	Mgt costs greater relative to No Action and Alts 2,4,5	Highest management costs.

3.3 Resource Issue 3 – Historic Properties

3.3.1 *Affected Environment*

The cultural resources present in the MCFO as of May 2005 consists of 7,065 prehistoric and 2,869 historic archeological sites (Aaberg 2006). Custer County contained 596 (8.4%) prehistoric sites which include types such as lithic scatters, stone circles, kill sites etc. and 195 (6.8%) historic sites which most commonly include homesteads, bridges, agricultural landscapes, and range features within the field office. Since 2005 the number of total cultural sites within the field office boundaries is 13,205 cultural sites, compiled from available GIS data, which is further narrowed down again to Custer County having 1,212 (9.17%) of all the sites within the field office.

[1] Order of Relative BLM Management Costs (in order of lowest to highest): No Grazing, Single Permit, Two Permits, RCA, RCA + Permits.

A review of Montana State Historic Preservation Office (SHPO) database on March 24, 2020 shows 28 previously recorded cultural sites the Pumpkin Creek allotment. Prior to this undertaking a Class III inventory for cultural resources identification only existed for approximately 3,512.03 acres of existing inventory. In 2020, the MCFO contracted a Class III inventory of the un-inventoried portions to identify and record all cultural resources and Historic Properties in the allotment. The results of the survey resulted in the recordation of *(number of sites to be determined when data is available)* new cultural sites, see cultural report number MT-020-20-67.

The Pumpkin Creek Allotment has *(number of sites to be determined when data is available from current survey being conducted)* cultural sites within its boundaries. The sites are generally divided into prehistoric (n= *(number of sites to be determined when data is available)*) and historic (n=*(number of sites to be determined when data is available)*) types. Within the allotment boundary 20 sites were previously determined not eligible for the National Register of Historic Places and eight of the sites were determined eligible for the National Register of Historic Places.

The *(number of sites to be determined when data is available from survey currently being conducted)* newly recorded sites were evaluated for their potential for listing in the National Register of Historic Places. Of the newly recorded sites *(number of sites to be determined when data is available)* of them were determined to be not eligible for listing on the National Register of Historic Places and *(number of sites to be determined when data is available)* of the newly recorded sites were determined to be eligible for listing on the National Register of Historic Places.

There are *(number of sites to be determined when data is available)* site within the allotment that are considered eligible for the National Register, 8 previously record sites and *(number of sites to be determined when data is available)* newly recorded sites. Each of the sites was evaluated for it impacts related to the Proposed action and its alternatives, see below. *See cultural project number: MT-020-20-67B.* The MCFO consulted on the efforts of identification, impacts, eligibility and effect with the SHPO on *DATE*. Concurrence and or comment was received from the SHPO on *DATE*. BLM addressed questions or issues with the SHPO on *DATE*.

3.3.2 *Environmental Impacts – Common to All Action Alternatives*

- Impacts to cultural sites and historic properties in the North, Middle, and Double Crossing pastures would involve *(number of sites to be determined when data is available)* cultural sites *(number of sites to be determined when data is available)* are not eligible for the National Register with XX of them being eligible for listing on the National Register. The eligible sites are (*24CRXXX*). These three pastures would require analysis dependent on specific prescriptions related to vegetation treatments. Sites 24CRXXX & 24CRXXXX would require XXXX prior treatment implementation.
- Authorizing only cow/calf pairs, yearling cattle within the allotment would impact cultural resources. The *(number of sites to be determined when data is available)* cultural sites that are determined not eligible for the National Register would be impacted by authorizing the grazing. Each of the *(number of sites to be determined when data is*

available) cultural sites that are recommended eligible for the National Register of Historic Places was evaluated for the potential for grazing to have an adverse effect to the Historic Property.

- Placement of cattle supplements within the allotment has the potential to effect Historic Properties. The proposed action requires that the placement of supplements be approved in advance. Historic Properties would be avoided by supplement placement by a minimum of 30 meters (approximately 100 feet) or more as appropriate.
- Range improvements projects would be repaired and maintained to BLM specifications prior to turnout each year. There are *(number of sites to be determined when data is available)* cultural sites within 30 meters (approximately 100 feet) of the existing range improvements within the Pumpkin Creek allotment. There are *(number of sites to be determined when data is available)* sites that are not eligible for listing on the National Register of Historic Places. There are *(number of sites to be determined when data is available)* sites that are considered eligible for listing on the National register of Historic Places. The range improvements projects are existing maintenance activities related to implementation of the grazing plan would not adversely affect Historic Properties within existing disturbances. New surface disturbance would require approval in advance. The *(number of sites to be determined when data is available)* Historic Properties identified within 30 meters (approximately 100 feet) and beyond which may be impacted by maintenance activities related to new surface disturbance would be specifically analyzed, consulted and if necessary, mitigated prior to surface disturbance activities.

3.3.3 *Environmental Impacts – No Action Alternative*

No Historic Properties would be affected by grazing if the no action alternative is selected.

3.3.4 *Environmental Impacts – Alternative 2*

This alternative would impact *(number of sites to be determined when data is available)* cultural sites that are determined not eligible for the National Register. There are XXX Historic Properties within the allotment, (*number of sites to be determined when data is available)* of the Historic Properties were determined to not have an adverse effect through this alternative. Several specific sites notably (*24CRXXXX, 24CRXXXX*) were identified as requiring physical barriers protection, formal testing, or data recovery etc. Each sites condition, type, elements contributing to eligibility are described in attached memorandum MT-020-20-(*XXX*).

3.3.5 *Environmental Impacts – Alternative 3*

Same as Alternative 2

3.3.6 *Environmental Impacts – Alternative 4*

This alternative would impact *(number of sites to be determined when data is available)* cultural sites that are determined not eligible for the National Register. There are XXX Historic Properties within the allotment. *(number of sites to be determined when data is available)* of the Historic Properties were determined to not have an adverse effect through this alternative. The

deferred and alternative rest natural of the reserve common allotment alternative impacts fewer of the sites simultaneously. Sites that are considered eligible for the National Register of Historic Places would require that, when the pastures are selected for grazing, specific sites within the targeted pastures would have temporary electric fences placed 30 meters (approximately 100 feet) from the sites. Which are (*24CRXXXX, 24CRXXXX*) were identified as requiring physical barriers protection, formal testing, or data recovery etc.

The changes in responsibility for maintenance of fences and range improvements are the same as noted in bullet #4 above in impacts common to all alternatives.
Each sites condition, type, elements contributing to eligibility are described in attached memorandum MT-020-20-(*XXX*).

3.3.7 *Environmental Impacts – Alternative 5*

Portions of this alternative that pertain to the Dry Divide, Pine Hill and Jack Divide pastures would have the same impacts and stipulations applied as the Reserve Common Alternate 4. The second part of this allotment would have impacts similar to alternatives 2 & 3 for the Dry Creek Pasture, Artesian, Well/West Ridge Pasture, Old Corral et al Pasture, Two Wells Pasture and the Upper Prat Pasture.

3.3.8 *Cumulative Effects*

Cumulative effects to cultural resources include the *(number of sites to be determined when data is available)* sites that are determined not eligible for the National Register of Historic Places. The available forage analysis for the Pumpkin Creek Allotment and the impacts to not eligible sites are not significant. Not eligible sites would continue to be and have been impacted by BLM actions within the Pumpkin Creek Allotment.

The *(number of sites to be determined when data is available)* sites determined eligible for the National Register of Historic Places within the allotment would not be impacted either through protection as part of the alternative and/or site specific design features. Future foreseeable actions and uses within the allotment may indicate or warrant additional protections or mitigation to Historic Properties. The remaining *(number of sites to be determined when data is available)* sites determined eligible for the National Register of Historic Places would not be adversely affected by authorizing grazing within the Pumpkin Creek Allotment. The impacts to these remaining sites would not be significant. See Cultural Project Number: MT-020-20-*XX*

3.3.9 *Mitigation and Residual Impacts*

No specific mitigation measures are warranted for each Historic Property due to the applicability of design features for each alternative.

Residual effects to cultural resources would be increased artifact visibility from grazing and groundcover reduction, where recreationalists and other visitors of the area would encounter resources putting them at an additional risk of collection or destruction. Areas of cattle concentration, see features common to all action alternatives, would also be impacted by the

concentration through trampling and erosion.

Historic Properties (Pending Field Visits evaluation of impacts and consultation) using temporary fencing would have reduced impacts due removing cattle traffic from the specifically identified sites and leaving the vegetation intact during the grazing season obscuring the surface artifacts from recreationists and visitors.

Historic Properties where permanent fencing is a design feature would remove impacts associated with grazing and cattle traffic would increase attention from recreationist and visitors. BLM would place protection, resource and interpretive signs (where need if the site value is conducive) in areas where vandalism and unauthorized collection from visitation can be monitored as part of the annual program of cultural resources. These historic properties are listed individually in Alternatives 2 and 3 above.

3.4 Resource Issue 4 – Nesting and brood rearing habitat for Grouse and Sensitive Status Avian Species

3.4.1 *Affected Environment*

The Pumpkin Creek Allotment is located in a General Habitat Management Area (GHMA) polygon for sage grouse, as identified by the 2015 Miles City Field Office ARMP, as amended. There is one unconfirmed sage-grouse (*Centrocercus urophasianus*) lek in the Pumpkin Creek Allotment with zero (0) birds observed in 2019. The nearest confirmed active lek is 0.83 miles to the southwest of the allotment and was last observed with zero (0) birds in 2019. Vegetation transects in the uplands show low levels of forb diversity and density and minimal amounts of big Wyoming sagebrush. As a result, sage grouse are not expected to heavily utilize the allotment for any of their seasonal needs (winter, breeding, nesting, or brood-rearing), but may be present in low numbers. The riparian area to the east of Highway 59 is expected to provide the best area of sage-grouse habitat in the allotment, particularly during brood-rearing season, as forb diversity there is higher than the rest of the allotment and there are abundant insects.

Pumpkin Creek contains high quality sharp-tailed grouse (*Tympanuchus phasianellus*) habitat. Five leks are known to occur in the Pumpkin Creek allotment. Sharp-tailed grouse are expected to highly utilize the allotment for all their seasonal uses, as they primarily prefer grasslands interspersed with shrub and brush-filled coulees.

Pumpkin Creek provides habitat for breeding birds primarily found in grassland systems, sage-brush obligates, and the eastern portion of the allotment contains abundant Great Plains riparian and Great Plains floodplain systems which provides quality habitat for riparian/forest species A species inventory list (Table 3) was created using a breeding bird inventory in Pumpkin Creek in June 2020 and occurrence data from the Locate Route of USGS Breeding Bird Survey. The Locate route has 41 years' worth of survey data and is located 18 miles to the southeast of Pumpkin Creek. It contains similar habitat (predominantly grassland systems with come sagebrush and riparian/forested systems interspersed).

Table 3. Sensitive Status Species Known or Expected to Occur in Pumpkin Creek

Grassland Species	**Sagebrush Obligates**	**Riparian/Forested Species**
Baird's Sparrow (*Centronyx bairdii*) Chestnut-collared Longspur (*Calcarius ornatus*)	Brewer's Sparrow *(Spizella breweri*) Greater Sage-grouse (*Centrocercus urophasianus*) Sage Thrasher (*Oreoscoptes montanus*)	American Bittern (*Botaurus lentiginosus*) Black-Billed Cuckoo (*Coccyzus erythropthalmus*) Loggerhead Shrike (*Lanius ludovicianus*) Red-headed Woodpecker (*Melanerpes erythrocephalus*)

A cooperative habitat improvement project began in 2012 with MTFWP and Pheasants Forever (Tongue River Chapter) to improve upland game bird habitat by restoring predominantly non-native habitats (crested wheatgrass, yellow sweet clover, smooth brome) to a more native species component, most of the upland units continue with a mixture of planting, spraying and prescribed fire treatments. In 2016, two units were planted to permanent/native vegetation and monitoring was completed the following year. In unit 1, native species included American vetch (*Vicia americana*) which was the dominant species by 55 percent followed by green needlegrass (*nassella viridula*) at 23 percent with an average number of seedlings per square foot of 0.32. Unit 3 had a much higher average number of seedlings per square foot at 1.81 and 1.65, and with thickspike wheatgrass (*Elymys lancelatus)* being the dominant species by 56 percent at one location and green needlegrass at 38 percent. Other units have been planted into cover crops and will later be planted to native species, depending on success. It should be noted that success of the cooperative project has been limited and conversion of non-native vegetative species such as crested wheatgrass can be extremely difficult and time consuming.

Horse Creek in the Pine Hill Pasture also provides some habitat for SSS riparian/forested avian species such as red-headed woodpeckers and loggerhead shrikes. Breeding bird diversity and richness is often correlated to higher amounts of vertical structures in riparian areas and woody draws (Rumble & Gobeille, 1998). Riparian vegetation along Horse Creek has improved since 2009 due to lack of grazing in the pasture from 2010 to 2017. The lack of grazing allows for the vegetation to become established and able to withstand grazing pressure. Riparian vegetation currently along Horse Creek include cottonwoods, willows, and three-square bulrush. Cottonwood seedlings have only just begun to be noticeable since 2011. Prat Creek and Dry Creek are ephemeral drainages and may not support riparian vegetation.

Numerous reservoirs exist throughout the Pumpkin Creek Allotment, but they lack the vertical features important for riparian avian species. The Pine Hill reservoir and the two unnamed reservoirs located near the headwaters of Horse Creek in the Jack Divide pasture lack the riparian vegetation and diversity (less than three riparian species present) and have no

established woody vegetation.

3.4.2 *Environmental Impacts – No Action Alternative*

Grassland birds vary in their habitat requirements and preferred grass growth structure and height. Most species have adapted to the lack of canopy cover by nesting on the ground or in shrubs (NRCS, 1999). Undisturbed expanses of grasslands are essential to many grassland bird species. Under the no grazing alternative, the existing habitat for upland birds, including sage-grouse and sharp-tailed grouse, is expected to improve in the short-term. The increase in vegetation would create additional cover for ground nesting birds and increase nesting success and chick survival. In the long term, plant accumulation, stagnation, and the eventual buildup of litter would reduce the overall vigor of the vegetation community and decrease nesting habitat. Species that prefer short to medium grass height, such as Mountain plovers (*Charadrius montanus*) and McCown's longspurs (*Rhynchophanes mccownii*), would be the most negatively affect by the no action alternative, while species which prefer tall grass, such as Sprague's pipits (*Anthus spragueii*) and American bitterns (*Botaurus lentiginosus*) are likely to increase under the no action alternative.

In the northern Great Plains, riparian areas occupy only one to four percent of the land, however, the highest total biomass for breeding birds can be found in these regions (Lesica & Marlow, 2011). Cattle spent a significant amount of time foraging in riparian zones in late summer as riparian forage is generally more palatable and higher in nutrient than upland vegetation during this time of years (Marlow and Pogacnik,1986). Shade and moisture also draw livestock into the draws and ravines, concentrating use and creating the potential for degradation and the spread of exotic and invasive species. Overuse in these riparian areas can suppress shrub and tree recruitment and lead to deteriorating riparian habitat.

Great Plains Wooded Draws and Ravines that are in less disturbed sites have a vegetation component that typically comprises of three-layers. The first layer is dominated by trees such as cottonwood, green ash or chokecherry, followed by a shrub layer and then a ground layer dominated by sedges (*Carex* species) and grasses. This structure provides for the greatest biodiversity and evenness of riparian avian species. There is expected to be an increase in aquatic invertebrates which are heavily utilized during chick-rearing season for species such as black-billed curlews and red-headed woodpeckers. Forb density and diversity is also expected to improve which is important for grouse species throughout their nesting and brood rearing seasonal use. Under the no grazing alternative, shrub and tree recruitment is expected to continue and overall benefit the riparian avian species. This would support the habitat improvement projects goal to restore or improve unsatisfactory or declining wildlife habitat

3.4.3 *Environmental Impacts – Alternative 2*

Under alternative 2, the allotment would be divided into nine pastures with one pasture rested each year. Time of year and duration in each pasture would vary, with the Pine Hill Pasture having the longest period of use (42 days maximum) and the Artesian Pasture having the shortest period of use (9 days). This rotation involves moving livestock through a series of pastures at scheduled time intervals, where each pasture is used only once during the growing season and

the sequence of grazing is changed each year. Total AUMs used vary from 1988 (year 6) to 2002 (years 1 and 2).

Under alternative 2, utilization levels would be below 50 percent. Grazing has little to no effect on sage-grouse habitat, provided that there is light to moderate use (30-50% utilization) and standards and guides are being met (Anderson and McCuistion, 2008; Smith et al. 2018). Grazing impacts on grassland birds is poorly understood and it is generally thought that grazing has little to no impact (Sliwinski, et al., 2019). Different species have different grazing tolerances and preferred vegetation height characteristics. Some species, such as Mountain plovers and McCown's longspurs, have a high grazing tolerance and prefer short-stature grass. Other species, such as Sprague's pipits and American bitterns, have low grazing tolerance and prefer a medium to tall grass structure (USDA, 2006). The highest density and diversity of grassland bird species is most closely linked with contrasting vegetation structure in large areas and at a large-scale, which grazing can be used to engineer (Sliwinski, et al., 2019)

Under the type of rest rotation grazing system in alternative 2, studies in Nebraska found they had the lowest heterogeneity in grass cover compared to three other grazing systems (Sliwinski, et al., 2019). This may limit the mosaic of differing herbaceous composition and structures providing habitat for an array of upland bird species. However, Pumpkin Creek currently has 2,365 acres of active Black-tailed prairie dog (Cynomys ludovicianus) colonies which typical maintain a grass height of 3 to 5 inches in the colonies. (Clippinger, N.W., 1989). These colonies are expected to benefit species which prefer short-stature grass structures while maintaining the mosaic of medium and tall grass structures that benefit species with preference for medium or tall grass height.

Restricting the pastures to the east of Highway 59, where restoration projects are ongoing to repair the uplands, to prescriptive grazing is expected to increase overall habitat for upland and riparian avian species for the same reasons discussed in the no action alternative. This would support the habitat improvement projects goal to restore or improve unsatisfactory or declining wildlife habitat

Under this alternative, the Pine Hill Pasture would be grazed the longest (42 days). Use of this allotment in August/September is expected to have the greatest impact to available riparian habitat, as cattle concentrate in these areas two consecutive years of use along Horse Creek during the hot season is expected to increase livestock concentration. This can reduce or eliminate the recruitment of new shrubs and trees and negatively impact the diversity of riparian avian species. Design features requiring the placement of supplements to be a minimum of 0.25 miles from water, riparian and wetland areas to draw cattle away from the riparian areas would negate some of the overuse in these riparian areas. Horse Creek would rest for seven years during the hot season following two years of use would provide for recruitment and reestablishment of riparian vegetation, as cattle generally spend more time in the uplands early in the season. This would maintain or enhance plant communities and habitat (Marlow and Pogacnik, 1986). This is likely to result in an increase in insect and forb diversity similar to what would be seen in the pastures east of Highway 59.

3.4.4 *Environmental Impacts – Alternative 3*

Under alternative 3, the allotment would be divided into two authorizations. One authorization would utilize 4 pastures that would rotate cattle through three of the pastures at scheduled time intervals, where each pasture is used only once during the growing season and the sequence of grazing is changed each year with each pasture rested every four years. The second would include 5 pastures with a similar rotation with each pasture rested every 5 years. Less AUMs would be utilized each year compared to Alternative 2.

Impacts to the three pastures east of Highway 59 would be the same as alternative 2, as only prescriptive grazing would be utilized. In the pastures to the west of the highway, the total maximum time spent in the pastures would increase (maximum of 34 to 61 days for authorization 1, and 28 to 55 days for authorization 2). Increasing the time in which grazing occurs in the Pine Hill pasture (61 days), particularly during the hot season when cattle are more likely to concentrate in the riparian areas, is expected to reduce the recruitment of shrubs and trees and limit the vertical components important for many species. The black-billed cuckoo, for example, inhabits dense, brushy thickets in coulees in the prairie portion of their range. A decrease in canopy cover showed a significant negative interaction with the black-billed cuckoo (Trzcinski et al., 1999). While most tree nesting riparian avian species are not directly impacted by grazing, the lack of new tree recruitment can, in the long term, eliminate habitat for these species.

Similar to alternative 2, the grazing rotation in the uplands is expected to cause minimal impacts to sage-grouse and breeding and brood-rearing habitat for grassland and sage-brush obligate bird species as grazing rarely effects upland songbirds (as discussed in alternative 2). A comparison of songbird communities in a rest-rotation grazing system as described in alternative 3 and season-long grazing system in eastern Montana found only one, the McCown's Longspur, of the eight species studied preferred this rest-rotation. This likely indicates that McCown's Longspurs are less reliant on structural heterogeneity. Meanwhile, there was no measurable effect to this grazing system on Brewer's Sparrows and Chestnut-collared Longspurs. This is likely because neither grazing system have an effect on the sagebrush component for the sagebrush obligate Brewer's sparrow and chestnut-collared longspurs are generalist primarily driven by annual forage productivity. Another study in eastern Montana found occupancy of mesocarnivores highest under this grazing rotation. Mesocarnivores, such as foxes, coyotes, badgers, and skunks frequently predate nests of ground nesting birds and can lead to decrease in nesting success. However, it was also strongly correlated with increased stocking rate (Vold, 2018). Ultimately, due to only utilizing less than 50 percent of the available forage under this alternative, there are no expected impacts to breeding and nesting habitat for upland sensitive status species.

3.4.5 *Environmental Impacts – Alternative 4*

In the event that the entire RCA is not used, under alternative 4 every pasture would be rested every other year and time in each pasture would vary from 13 (Artesian pasture) to 56 days (Pine Hill Pasture). Under this deferred rotation system, impacts to grassland and sage-brush obligate breeding birds is expected to be similar to alternative 3. No impacts to species density for species such as Brewer's sparrows and Chestnut-collared longspurs, but a possible increase in the amount of mesocarnivores that may predate nests and impact nesting success rates. Again, with a

utilization under 50 percent of available forage, there are no expected impacts to breeding and nesting habitat for upland sensitive status species.

Days of grazing in the Pine Hill pasture would be slightly less that alternative 2 (56 days versus 61 days) and would receive more years of rest as long as the entire RCA is not used. This alternative would also allow for flexibility if a problem is noticed or a specific pasture needs additional rest to enable the enhancement. In the long term, this can improve riparian habitat for SSS avian species, allowing for recruitment of shrubs and trees to create the vertical component important to many species and increase insects and forbs for forage important during nesting and brood-rearing seasonal use. Even if all 56 days of use in this pasture are used during the hot season, the additional rest and flexibility in the plan can be used to improve conditions.

In the event the entire RCA is used multiple years in a row, riparian areas can be severely impacted, especially if riparian areas are repeatedly grazed during the hot season and no new recruitment can occur, similar to alternative 3. The recruitment of shrubs and trees would be limited and the three-layer vegetation component important for many riparian avian species would be reduced or even eliminated. The black-billed cuckoo habitat would decrease due to reduced canopy cover and the lack of new tree recruitment can eliminate habitat for tree nesting species. However, with the flexibility the plan allows, problems can be addressed in later years and the pasture can be given additional rest for recovery.

3.4.6 *Environmental Impacts – Alternative 5*

As with alternative 4, use of the RCA would vary from year to year and can expect similar impacts. Under alternative 5, sage-grouse, grassland and sagebrush obligate habitat in the uplands is expected to have similar impacts as both alternatives 3 and 4 as utilization is below 50 percent of the available forage. Species density for sage-brush obligates such as Brewer's sparrows and generalist such as Chestnut-collared longspurs are expected to remain the same. The allotment may see an increase in the amount of mesocarnivores that may predate nests and impact nesting success rates. Again, with a utilization under 50 percent of available forage, there are no expected impacts to breeding and nesting habitat for upland sensitive status species.

The Pine Hill pasture would be grazed for 81 days for two consecutive years before being rested for one year. Every third year these 81 days of use would coincide with the hottest time of the year (July, August, and September). Heavy and prolonged use in Horse Creek would be expected to severely limit the ability of the habitat for SSS riparian avian species to improve, thus limiting their density and diversity. One year of rest would likely not allow for enough recovery time. Overall, habitat for riparian avian species would, at best, be maintained at current conditions but would see no additional improvements. Even with design features requiring the placement of supplements to be a minimum of 0.25 miles from water, riparian and wetland areas to draw cattle away from the riparian areas to negate some of the overuse in these riparian areas, such prolonged use can reduce or eliminate the recruitment of new shrubs and trees, suppress or eliminate the three layer vegetation structure required by many riparian avian species, and limit insect and forb diversity crucial to many species during brood-rearing season. As with alternative 4, the lack of additional tree recruitment would, in the long term, reduce and possibly eliminate habitat for tree nesting birds as no new trees would replace the existing ones.

The six-pasture grazing authorization does not provide quality habitat for species typically

associated with riparian areas. However, for upland game birds similar impacts are expected as Alternative 1. Utilization levels would be below 50 percent and grazing has little to no effect on sage-grouse habitat, provided that there is light to moderate use (30-50% utilization) and standards and guides are being met (Anderson and McCuistion, 2008; Smith et al. 2018). Based on species grazing tolerances and preferred vegetation height characteristics, some species, such as Mountain plovers who have a high grazing tolerance and prefer short-stature grass, may decrease. Other species, such as Sprague's pipits and American bitterns which have low grazing tolerance and prefer a medium to tall grass structure may increase (USDA, 2006) as the highest density and diversity of grassland bird species is most closely linked with contrasting vegetation structure in large areas and at a large-scale (Sliwinski, et al., 2019).

3.4.7 *Cumulative Effects*

Under the No Action Alternative, passive restoration techniques by means of removing cattle would continue throughout the Pumpkin Creek pastures. The riparian area and riparian habitat would be expected to improve over time. Ongoing restoration with PF and MTFWP in the uplands east of Highway 59 is expected to continue along with additional restoration of Pumpkin Creek. Active restoration with the use of planting, prescribed fire, and spraying would continue along Pumpkin Creek is a reasonably foreseeable actions to improve the conditions of both the uplands and riparian area to the east of Highway 59. This would allow for more regeneration of riparian vegetation, closing of the canopy cover, and overall improved habitat for riparian species, particularly those that nest in trees. Insect and forb density and diversity would be expected to improve, increasing chick survival for species heavily reliant on this food sources during chick rearing. Additionally, conversion of cropland and planting of native forbs and grasses would provide cover for ground nesting birds and increased food sources.

Under alternatives 2-5, prescriptive grazing under these alternatives would be expected to supplement future restoration activities in the pastures to the east of Highway 59. These alternatives would allow the BLM to employ additional tools for the restoration projects. The use of these prescriptive grazing techniques can be used to target invasive species, which can predispose native vegetation, especially woody plants, to secondary pathogens or to environmental stress (Poff et al., 2012). It can also be used to target upland vegetation undesirable to upland game birds. This would have additional positive, cumulative effect on habitat for both riparian and upland avian species during their nesting and brood-rearing season.

3.5 Resource Issue 5 – Riparian and Wetland Areas

3.5.1 *Affected Environment*

Named creeks on the Pumpkin Creek Allotment include Dry Creek, Prat Creek, Horse Creek, Bridge Creek, Johnson Creek, and Pumpkin Creek. Most of these creeks, along with several reservoirs, are associated with riparian and wetland areas. See Table 4 for riparian-wetland habitat types found on the allotment. Pumpkin Creek is the only perennial creek on the allotment. Dry Creek, Prat Creek, Horse Creek, Bridge Creek, and Johnson Creeks were inventoried between 2010 and 2014. These drainages were found to be ephemeral upstream in the drainage and more intermittent in nature along downstream stretches, with most flow occurring because of

snow melt and precipitation events. Groundwater contributions maintain some water levels in isolated pools throughout a portion of the year.

Horse Creek is approximately six miles long and flows through the Jack Divide, Dry Divide, and Pine Hill pastures (on the west side of Highway 59). Downstream stretches of Horse Creek contain moist zones with water surfaced well into the summer. These wet areas are holding riparian species such as three-square bulrush and prairie cordgrass. The riparian area along Horse Creek has been improving since acquisition in 2009 predominately due to no grazing from 2010 to 2017 (other than one authorization in 2014). Woody riparian vegetation was recently noted during an aquatic inventory in 2015 where cottonwood and willow seedlings were found along lower reaches of Horse Creek. This evidence suggests that the area has the potential to support a mature habitat of the woody riparian vegetation. Aquatic habitat is monitored every five years, mainly through photo point surveys and qualitative (observational) data. Since grazing was authorized on the allotment in 2017, Horse Creek has not been reevaluated. Horse Creek is scheduled to be monitored again during summer field season of 2020 (at which point any new data would be added into this analysis). Therefore, the current condition of these riparian areas along Horse Creek are not known.

The other drainages (Dry, Prat, Bridge, and Johnson Creeks) were found not to support riparian vegetation. There are several other unnamed ephemeral drainages found on the allotment. The ephemeral drainages have not been inventoried but mostly likely would not support riparian vegetation. See Table 4 for acres of riparian-wetland habitat found on the allotment.

Table 4. Acres of Riparian-Wetland Habitat types found on the Pumpkin Creek Allotment

Riparian-Wetland Type	**Total Acreage**
Freshwater Emergent Wetland	33.26
Freshwater Pond	44.19
Riparian Forested	5.56
Riparian Scrub-Shrub	0.25
Riverine	23.56
Total	**106.82**

Pumpkin Creek is a perennial stream with approximately eight stream miles flowing through the North, Middle, and Double Crossing pastures north and east of Highway 59. Common riparian vegetation species found along Pumpkin Creek include three-square bulrush, creeping spike-rush, prairie cordgrass, plains cottonwood, and sandbar willows. Pumpkin Creek is currently in a channelized state indicative of a Stage 2 type of stream evolution process (Cluer and Thorne, 2013). A legacy of land-use effects (channelization of the stream, spreader dikes, season-long grazing) have left this portion of Pumpkin Creek lacking in riparian tree and shrub diversity, with little to no recruitment or propagation of riparian trees and shrubs, reduced riparian buffers, and a diminished floodplain size and functionality. All of which is resulting in poor to marginal riparian habitat.

Proper Functioning Condition (PFC) is a qualitative method for assessing hydrology, vegetation, soils, physical state, and processes to determine the overall condition or health of riparian areas. Classifications are Proper Functioning, Functioning at Risk, and Nonfunctioning. Two reaches of Pumpkin Creek were assessed for riparian health in 2015 and were found to be Functioning at Risk without an apparent trend. This means these reaches are in limited functional condition. However, an existing hydrologic, vegetative, or geomorphic attribute makes it susceptible to impairment. The "no apparent trend" finding provides that based upon observation and professional judgement at that single point in time the interdisciplinary team was unable to determine if those reaches were improving or degrading over time. Moreover, there are headcuts in Pumpkin Creek that by themselves show a non-functioning channel with a downward trend. Data from twelve cross section monitoring points and four stream habitat sites along Pumpkin Creek have shown little improvement in stream channel characteristics with no grazing from 2010 to 2017, other than one authorization in 2014. These data show parts of Reach 1 are degrading and widening out, transitioning from a Stage 2 type of channel to a Stage 3 or 4. Habitat data at Reach 4 have shown an increase in sediment size, from fines to fine gravel and coarse gravel, and an increase in cottonwood seedlings. The Reach 2 and Reach 3 areas of Pumpkin Creek have shown very little to no improvement since acquisition in 2009. Once riparian-wetland areas exceed a threshold, they can remain in a degraded state for decades to centuries. The meander scars in the valley bottom are evidence that Pumpkin Creek once functioned in a Stage 0 type of stream evolution process (Cluer and Thorne, 2013). One main issue preventing the attainment of a properly functioning stream channel (Stage 0 or Stage8) is the lack of structure (woody vegetation) along Pumpkin Creek.

In 2011 the BLM began planting native trees and shrubs along the eight miles of Pumpkin Creek (Reach 4 in 2011, Reach 3 in 2012, Reach 2 and Reach 1 in 2013) contained within the North, Middle, and Double Crossing pastures to increase the native seed source along the creek for woody species such as plains cottonwood and sandbar willow (See Map 2 in Appendix E). Approximately 15,800 plants (both rooted stock and cuttings) were planted between 2011 and 2013. As of 2015, the BLM estimated a 42 percent survival rate of the plantings. Since the planting have taken place, natural recruitment of cottonwood and willow seedlings have increased throughout the four reaches of Pumpkin Creek, evident from photo point surveys.

Multiple age classes are especially important when it comes to riparian trees and shrubs. The entire lifecycle (immature, mature, old stands, dead standings, down wood, instream wood) of riparian trees and shrubs are used by all terrestrial and aquatic species. Saplings to mature stands along the bank provide bank stabilization, thermal buffers, and water quality regulation for fish and other aquatic species. Dead standing trees provide perch sites, nest sites and food for hawks, eagles, owl, bats, woodpeckers, and cavity nesting birds. The down wood provides homes to small mammals, insects, sunning spots for reptiles, and aids in erosion control. Instream wood slows stream flow, creates pools and riffles, rebuilds gravel beds, and provides hiding and feeding spots for fish (Logan 1997). Thus, a multiple age class is one of the most important characteristics of a resilient and healthy riparian area. With multiple age classes there would be new recruitment to replace the old stands of trees and continue providing the important ecosystem services listed above.

In 2012 the BLM entered into a multi-year cooperative habitat improvement project with

MTFWP and PF for a native prairie restoration project to improve uplands and wetland areas along and adjacent to Pumpkin Creek. Objectives of the cooperative project include improving floodplain functionality, aquatic and wildlife habitat in Pumpkin Creek, the riparian areas, and surrounding uplands. The cooperative habitat improvement project includes restoration activities on approximately 630 acres within the North and Middle pastures (Map 3 in Appendix E). The cooperative restoration projects are currently ongoing under a separate EA (DOI-BLM-MT-C020-2012-0192-EA).

The Pine Hill reservoir is a perennial pond, approximately 5 acres in size, and is located on a tributary to Bridge Creek in the Pine Hill pasture. There is an unnamed reservoir located near the headwaters of Horse Creek in the Jack Divide pasture that is approximately 9 acres in size. There are two unnamed reservoirs (on two separate drainages) found within the Dry Divide pasture approximately 12 acres and 2.5 acres in size. The riparian vegetation associated with these reservoirs are lacking in diversity (generally less than three species) and the woody vegetation (when present) are not established populations, meaning there are not multiple age classes present. There are three other reservoirs scattered throughout the allotment that appear to hold water but have not been inventoried. These reservoirs likely include similar riparian vegetation.

3.5.2 *Environmental Impacts – No Action Alternative*

Under this alternative grazing would not be authorized. No grazing, or removing grazing, is a type of passive restoration technique. Some studies have shown that passive restoration alone can be enough for stream channels to improve, thereby improving the adjacent uplands and riparian areas (Batchelor et al. 2015, Magilligan and McDowell 1997, Bellows 2003). The downstream section of Pumpkin Creek (Reach 1, see Map 2 in Appendix E) has shown some improvement in stream evolution since acquisition. After acquisition in 2009, the allotment did not receive grazing from 2010 to 2017, other than one authorization in 2014. Cross section data from the Reach 1 area shows the stream channel is degrading and widening, transitioning from a stage 2 to a stage 3 or 4 channel (Cluer and Thorne, 2013). The Reach 2 and Reach 3 sections of Pumpkin Creek have shown very little to no improvement with passive restoration (no grazing) alone. Although the removal of grazing would allow for the stream evolution process to continue, the healing process in a structurally starved, incised channel can take decades to centuries to reach a recovered or desired state in stream evolution. Active restoration techniques coupled with passive (no grazing) techniques can accelerate the healing process.

Horse Creek, which is located west of the highway, in an intermittent drainage. There is some evidence of riparian species trying to get established in intermittent locations along the creek. The passive restoration in this habitat area would potentially allow for riparian habitats to become more established and prevalent. Woody riparian vegetation would recruit and aid in bank stabilization and add structure to the system.

Allowing the riparian vegetation to recover would maintain wetland and riparian habitat as well as provide ecosystem services such as filtering sediment, stabilizing banks and providing food and habitat source for aquatic and upland species.

3.5.3 *Environmental Impacts – Alternative 2*

The majority of the riparian and wetland areas are associated with Pumpkin Creek which flows through the North, Middle, and Double Crossing pastures. Under this alternative, the only grazing that would occur in these three pastures is prescriptive grazing. Prescriptive grazing is a type of grazing used for very specific vegetation treatments as opposed to livestock production. Prescriptive grazing would occur infrequently, livestock would be confined to specific areas of the pastures to accomplish the desired vegetation treatment and would generally occur in very short durations. Any prescriptive grazing that would occur within these three pastures would also follow Best Management Practices (BMPs) for grazing uplands and riparian areas (e.g. Bellows 2003). The typical impacts to riparian and wetland areas from grazing (browsing of woody vegetation, soil compaction, trampling, destabilizing banks, etc.) would not be expected to occur with prescriptive grazing. The differences in impacts from no grazing and prescriptive grazing would be negligible, as prescriptive grazing is expected to have the same impacts as no grazing. See the No Action Alternative (Section 3.5.2) for effects to the riparian-wetland areas within the North, Middle, and Double Crossing pastures.

Under this alternative there would be one grazing authorization for the allotment west of Highway 59. The riparian-wetland areas would not be fenced out from grazing. Therefore, there would be some impacts to the riparian-wetland areas from trampling and browse by livestock. The days of use for each pasture are less than 45 days (maximum recommended use, see Issue 1, Section 3.1.3). However, livestock use is not uniform between uplands and riparian areas (Armour et al. 1994). Cattle tend to spend more time in riparian and wetland habitat seeking shade and water during the hot season. Impacts to riparian areas would differ depending on the type of livestock (cow/calf pairs, bulls, or yearlings) as well. Cow/calf pairs tend to spend most of their time near water (within a mile), yearlings travel farther from water and travel more often, while bulls stay near the water and spend more time loafing in the water creating the most impacts on the riparian and aquatic habitat.

This alternative has the shortest grazing period per pasture but as stated before, livestock utilize riparian areas disproportionately than uplands. Any riparian habitat present in pastures used during the hot season would receive more impact (trampling, destabilizing banks, and excess nutrients and sediment input to the aquatic habitat) than during cool season use, provided the soils are dry during cool season use. The hot season of use in Eastern Montana can be lengthy, sometimes from July through September. Given the length of hot season, pastures with riparian areas could receive hot season use for 3 or 4 seasons in a row (see Appendix G) even though livestock would always be turned out in each pasture at different times each year. Consistent hot season use can impact riparian vegetation to a degree that hinders recovery (Ehrhart and Hansen 1997). Impacts to riparian areas can be lessened when other means (offsite water, supplements, etc.) are used to redistribute livestock (Ehrhart and Hansen 1997, Bellows 2003). There are other sources of water (pits and wells) in most pastures to encourage livestock to move out of the riparian areas associated with the creek channels and reservoirs. For example, in the Pine Hill pasture there are two pits and one well for offsite water. The pits are approximately 0.5 and 1.5 miles from Horse Creek and 0.7 and 0.75 miles from the Pine Hill Reservoir. The well, however, is less than 350 feet from Horse Creek and would not serve as a tool for distributing livestock away from Horse Creek. Design features requiring supplements to be placed a minimum of 0.25 miles from water, riparian, or wetland areas would also facilitate livestock movement away from

riparian and wetland habitat.

There is the potential for woody riparian vegetation to exist along Horse Creek. Cottonwood and willow seedlings were noted in 2017. These seedlings have not had enough time to grow above browse height. It can take five to ten years for woody vegetation to grow above browse height and recruit to the population. Any cottonwood or willow seedlings remaining on this portion of the allotment would remain small and shrub like due to grazing. Stunted woody vegetation would not provide the same structure that mature stands would in the stream channel evolution process. The herbaceous vegetation (e.g. three-square bulrush) may regenerate and grow to maturity, but trampling could be an issue depending on what time of year the area is grazed. It is also expected that cattle would congregate in the damp and wet areas during the heat of summer even if there is water dispersed throughout the allotment causing degradation of the critical moist areas.

3.5.4 *Environmental Impacts – Alternative 3*

Impacts to the North, Middle, and Double Crossing pastures would be the same as the No Action Alternative and Alternative 2, please see Section 3.5.2 for impacts to riparian-wetland areas in these three pastures.

Under this Alternative there would be two grazing authorizations, a 4-pasture and a 5-pasture system for portions of the allotment west of Highway 59. The 4-pasture rest rotation system includes most of the riparian and aquatic habitat on the allotment. The days of use within the 4-pasture system exceeds the maximum recommended amount (45) for three of the four pastures. Having livestock on the riparian areas for longer periods of time (than Alternative 2) could increase the effects on riparian and wetland habitat from livestock use, even though the stocking rate is lower in this alternative than Alternative 2. Most studies agree that the length of time spent in one pasture has the greatest influence on impacts to riparian areas over other elements such as number of cattle or season of use (Bellows 2003, Swanson et al. 2015, Ehrhart and Hansen 1997, etc.) There is the potential for woody riparian vegetation to exist along Horse Creek. Any cottonwood or willow seedlings remaining on this portion of the allotment would likely not survive past the seedling stage. The herbaceous riparian vegetation would be expected to maintain current conditions. Trampling of the riparian vegetation could be an issue depending on what time of year the area is grazed. It is also expected that cattle would congregate in the damp and wet areas during the heat of summer, even with other water sources dispersed throughout the allotment, causing degradation of the critical moist areas.

There is some uncertainty of the current condition of riparian and wetland habitat within the 5-pasture system. The days of use in the 5-pasture system are under the maximum recommended amount for all pastures except one (Upper Prat Creek pasture). Effects to riparian areas (if present) within the 5-pasture system would be similar to effects within the 4-pasture system, but slightly less degrading to the riparian vegetation. This will be dependent on the time the cattle stay and any particular year climatological impacts (precipitation and temperature variation).

Offsite water sources and design features would be the same as in Alternative 2.

3.5.5 *Environmental Impacts – Alternative 4*

Impacts to the North, Middle, and Double Crossing pastures would be the same as the No Action Alternative and Alternatives 2 and 3, please see Section 3.5.2 for impacts to riparian-wetland areas in these three pastures.

This Alternative would designate the portion of the allotment west of Highway 59 a Reserve Common Allotment (RCA) and would be separated into two grazing rotation systems, a 3-pasture deferred and a 6-pasture deferred. Grazing would alternate between the two systems yearly, leaving one system to be rested each year (unless a need arises from an emergency). The 3-pasture system includes most of the riparian and aquatic habitat on this portion of the allotment. The days of use for each pasture within the 3-pasture system are less than in Alternative 3 but more than Alternative 2. As stated before, livestock tend to utilize riparian areas more heavily than uplands. Increasing the number of days spent in a pasture could increase the impacts on the riparian areas. The same tools would be utilized under this alternative as discussed in Alternative 2 to facilitate livestock movement into the uplands such as offsite water and placements of supplements away from water and riparian areas. The herbaceous riparian vegetation (within the 3-pasture system and any present in the 6-pasture system) would be expected to improve under this alternative. Cottonwood and willow seedlings, if currently present along Horse Creek, would be expected to recruit and become established in the riparian areas. As woody riparian vegetation establishes, the stream channel would have more opportunity to gain structure needed to improve channel form and function.

On alternate years, the 6-pasture rest rotation system would be utilized. The drainages within these six pastures were found to not currently support riparian vegetation. However, these drainages may have the potential to support riparian vegetation. Without complete rest and some form of restoration, these drainages would not be expected to support riparian vegetation again.

In the event of an emergency (e.g. wildfire) the rested pastures in the RCA would be made available to those affected by the emergency. Use of the rested RCA pastures would follow the normal grazing system that is used on alternate years (either 3-pasture deferred, or 6-pasture deferred). There would not be any season long use or overuse during an emergency.

Before authorizing a temporary permit under category 3 (see Appendix H for how permits would be offered), the BLM would assess the riparian areas through a riparian assessment process such as PFC. If riparian assessments begin to show a downward trend (e.g. no rest treatments due to emergency use) then the BLM would have the management option to not graze those pastures for a year or more to allow the riparian areas to recover. With the planned rotation, design features (placement of supplements), and the management option to rest pastures for resource concerns the riparian vegetation (herbaceous and woody) would be expected to improve under this alternative. Allowing the riparian areas to improve would in turn improve the wetland and aquatic habitat. Allowing woody vegetation time to recruit and establish would greatly improve riparian areas and aquatic habitat as woody vegetation provides additional stream bank stabilization, other food sources and cover for aquatic species, and would eventually provide instream structure and habitat.

3.5.6 *Environmental Impacts – Alternative 5*

Impacts to the North, Middle, and Double Crossing pastures would be the same as the No Action Alternative and Alternatives 2, 3, and 4, please see Section 3.5.2 for impacts to riparian-wetland areas in these three pastures.

This Alternative would split the portion of the allotment west of Highway 59 into a Reserve Common Allotment (RCA) and one grazing authorization. The RCA would consist of Dry Divide, Pine Hill, and Jack Divide pastures and would follow a 3-pasture rest rotation. The 3-pasture system includes most of the riparian and aquatic habitat on the allotment. The duration of use on the 3-pasture system is longer than Alternatives 2, 3, and 4, with days of use ranging from 62 to 81 days; well over the maximum recommended number of days of use (see Issue 1). As stated in previous alternatives, the duration of use is a major function in the intensity of the impacts to riparian and wetland areas because cattle utilize riparian areas more heavily than uplands (Armour et al. 1994). Allowing livestock to graze in one pasture for 62 to 81 days increases re-grazing of vegetation and increases time spent in riparian areas. As discussed in the Affected Environment section, the current condition is uncertain. If the current condition is downward trending, this rotation would likely exacerbate this condition until it fails completely. This rotation would not allow for woody vegetation to establish because there would not be enough rest for seedlings to recruit to an established population (Bellows 2003). Because this portion of the allotment would be an RCA, the BLM would have the management option to rest these pastures for one or more years to allow the riparian areas to improve if needed. The BLM would monitor the riparian areas and assess the condition prior to authorizing a temporary permit.

In the event of an emergency (e.g. wildfire) the RCA pastures would be available for use to those affected by the emergency (if not currently permitted on a temporary permit). In the case of an emergency all three pastures would be available to accommodate one herd for that season.

The second half of the allotment would be grazed as a 6-pasture rest rotation. The drainages within these six pastures were found to not support riparian vegetation. These drainages may have the potential to support riparian vegetation. However, without complete rest and some form of restoration, these drainages would not be expected to support riparian vegetation again.

Offsite water sources and design features would be the same as in Alternative 2.

3.5.7 *Cumulative Effects*

For this proposal the cumulative effects analysis area would be the Pumpkin Creek Allotment. Within the Pumpkin Creek Allotment the BLM has future restoration plans for restoring the processes and attributes that historically sustained the health of the riparian and aquatic zone along Pumpkin Creek in the North, Middle, and Double Crossing pastures (under separate NEPA process). Pheasants Forever and MTFWP will continue with their restoration plans for the uplands and riparian areas within the North and Middle pastures (NEPA # DOI-BLM-MT-C020-2012-0192-EA).

Under the No Action Alternative grazing would not be authorized No grazing, or removing

grazing, is a type of passive restoration technique. Some studies have shown that passive restoration alone can be enough for stream channels to improve, thereby improving the adjacent uplands and riparian areas (Batchelor et al. 2015, Magilligan and McDowell 1997, Bellows 2003). However, most of Pumpkin Creek within the North and Middle pastures is severely degraded. Cross section data from 2010 to 2018 have shown little to no improvement in stream channel characteristics (e.g. aggradation of stream bed, suitable width to depth ratios, new floodplain development, etc.) from passive restoration alone (Section 3.5.1). Once riparian-wetland areas exceed a functional threshold, they can persist in a degraded state for decades to centuries. As active restoration activities continue, the No Action alternative (no grazing) would complement these restoration projects as severely degraded riparian areas require both active and passive restoration techniques to accelerate and sustain the healing process. Over time, improved riparian-wetland areas would result in improved floodplain functionality, bank stabilization, proper functioning riparian areas, and restored uplands. With the additional restoration plans in the foreseeable future, we would expect a cumulative positive effect on the riparian and wetland areas from not authorizing grazing in the North, Middle, and Double Crossing pasture.
The riparian areas on the west side of Highway 59 would not be cumulatively impacted as there are no restoration plans for the west side of the allotment.

Under Alternatives 2-5, grazing would be utilized as a tool for restoration on the riparian and wetland habitat on the north and east side of Highway 59. Under these alternatives the BLM would have an additional tool to use for restoration projects. If or when grazing would be a suitable tool to achieve restoration goals, the grazing prescription would be designed for site specific upland or riparian and wetland restoration goals and objectives. Prescriptive grazing under these alternatives would be expected to complement any restoration activities planned in the future. The differences in impacts from no grazing and prescriptive grazing would be negligible, as prescriptive grazing is expected to have the same impacts as no grazing. Because all Action Alternatives would only utilize prescriptive grazing in these three pastures, the cumulative impacts would be the same under all Action Alternatives. Since prescriptive grazing is expected to have the same impacts as no grazing, the cumulative impacts would be the same under all Action Alternatives as the No Action Alternative.

At some point in the future the Pine Hill Reservoir will be inspected for viability of supporting sport fish. If the reservoir is found capable of supporting sport fish a plan would be worked out with MTFWP to stock the reservoir.

Under the No Action Alternative there would not be any cumulative effects from not grazing and stocking the reservoir. Under the Action Alternatives (2-5) the reservoir would be fenced to protect and improve fish habitat from impacts by cattle (trampling and browse of vegetation, congregating in the reservoir, manure deposition in the reservoir, etc.). The riparian habitat within the exclosure would be expected to improve over time, therefore increasing the health of the aquic habitat. Because the exclosure would remove the pressure and stressors of grazing from the riparian and wetland habitat around the reservoir, the cumulative effect under each Action Alternative would reduce the impacts back to the level at the No Action Alternative, no grazing.

3.6 Resource Issue 6 – Water Resources

3.6.1 *Affected Environment*

The Pumpkin Creek Allotment is bisected by a north-south topographic divide. The west half (Milk-Tongue River watershed; HUC 1009010213) drains to the Tongue River via Dry Creek, Prat Creek, and several unnamed, ephemeral channels. The east half (Lower Pumpkin Creek watershed; HUC 1009010212) drains to Pumpkin Creek (proper) either directly or via Horse Creek, Johnson Creek, Bridge Creek, and several unnamed, intermittent, and ephemeral channels. Pumpkin Creek subsequently drains to the Tongue River approximately nine miles downstream from the north boundary. Dry Creek, Prat Creek, Horse Creek, Bridge Creek, and Johnson Creeks were inventoried between 2010 and 2014. These drainages were found to be ephemeral upstream in the drainage and more intermittent in nature along downstream stretches, with most flow occurring because of snow melt and precipitation events. Groundwater contributions maintain some water levels in isolated pools throughout a portion of the year.

Pumpkin Creek from its confluence with Little Pumpkin Creek to the Tongue River is perennial and is listed on the MT Department of Environmental Quality (MT-DEQ) §303(d) list of the Clean Water Act as impaired due to water temperature and salinity. The impairment has been attributed to natural sources and irrigated crop production. Stream channel form and function of the portion of Pumpkin Creek on the allotment are in poor condition. Pumpkin Creek is in an incised state with no access to the floodplain (see Section 3.5.1). Average daily flows within Pumpkin Creek range anywhere from less than one cubic feet per second (CFS) to over 4,000 CFS (Figure 1) with peak flows ranging anywhere from less than 100 CFS to near 8,000 CFS (Figure 2). Without access to the flood plain, Pumpkin Creek will continue to have increased erosion that contributes to sedimentation and loss of aquatic habitat. The drainage area is large, covering 696 square miles. With this amount of land with much of it having significant topo relief can give way to high 12-hour hydrologic fluctuation causing flash flooding and other associative issues.

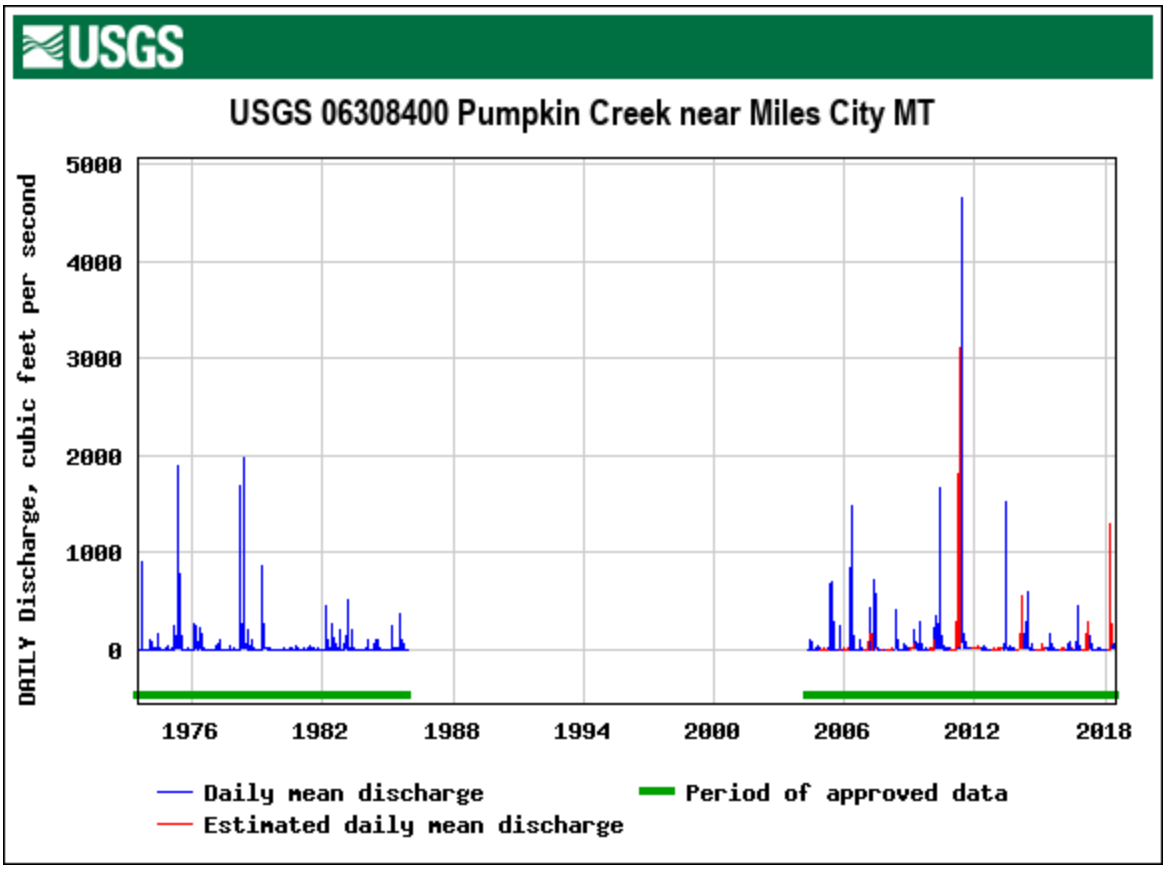

Figure 1. Daily mean discharge (cubic feet per second) in Pumpkin Creek from 1973 to 2018. (Data from USGS, 06308400 gauge)

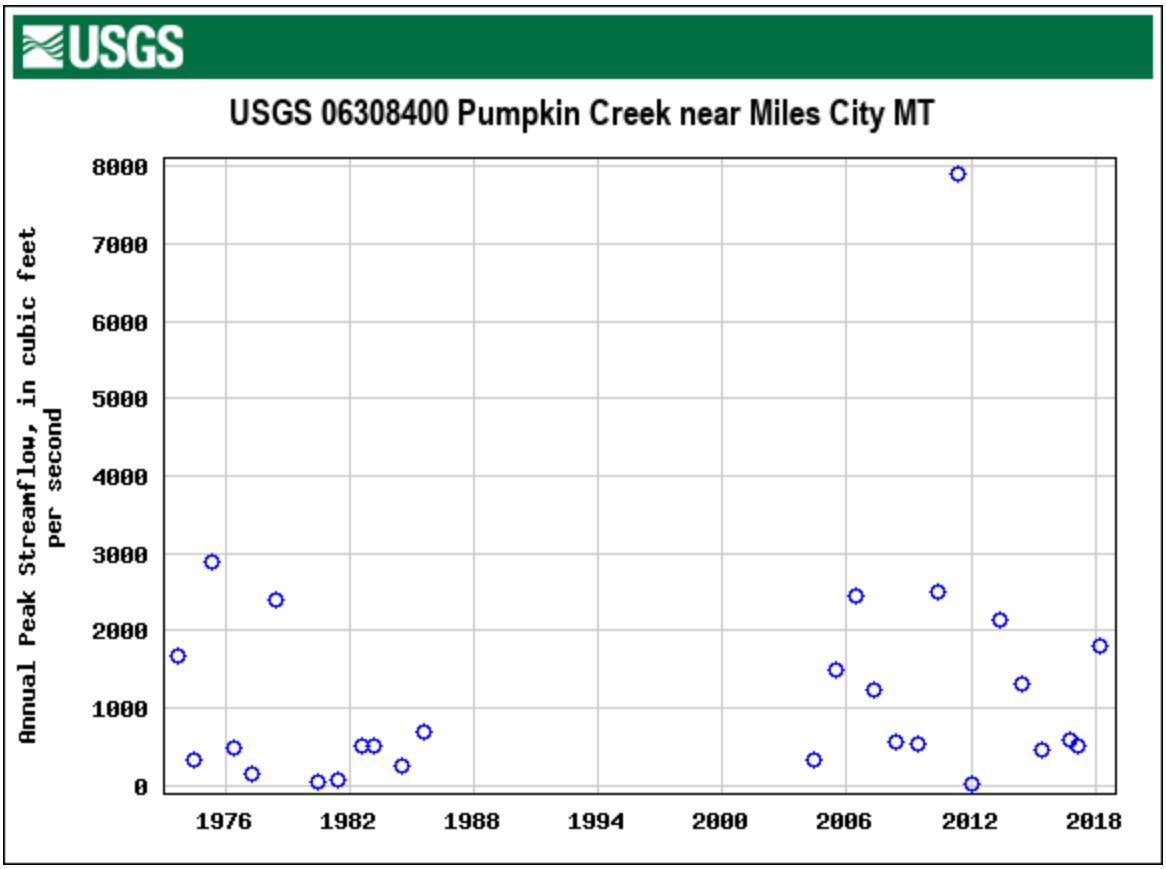

Figure 2. Annual peak flows in cubic feet per second for Pumpkin Creek from 1976 to 2018. (Data from USFS 06308400 gauge).

The health of riparian vegetation can be an indicator of the quality of water resources. With improved riparian vegetation, water quality will be improved as riparian vegetation acts as a buffer between the uplands and the aquatic habitat, filtering out contaminants and sediment. Riparian vegetation stabilizes stream banks and add structure to the system needed to function properly. When a stream has access to its floodplain, flood waters are absorbed and slowly released, increasing water quantity. See the Affected Environment section for Riparian and Wetland Areas (3.5.1) for more details on the condition of drainages within the Pumpkin Creek Allotment.

With most of the pastures within the Pumpkin Creek Allotment mainly consisting of intermittent/ephemeral drainages there is little effect on surface water quality and quantity. The intermittent drainages also do not have significant impacts on water quality and quantity due to the limited time they flow and the fact that much of the water is absorbed in the ground in the lower reaches, due to the wider valley bottoms and decreased drainage slope.

3.6.2 *Environmental Impacts – No Action Alternative*

Under this alternative grazing would not be authorized. Impacts to water resources under this alternative would be similar to the impacts for riparian and wetland areas (See Section 3.5.2 for more details). As riparian and wetland areas improve so would water quality and quantity.

Pumpkin Creek is currently in a channelized state. Allowing riparian vegetation to establish would help stabilize stream banks, decrease excess sediment loads, provide thermal buffers for aquatic species, trap and store sediment, and dissipate the erosive force of floodwaters. As woody riparian vegetation increases, this would add structure to the system that is needed for the stream channel to improve to a proper functioning state. Once the stream channel regains access to its floodplain, water quantity would be improved as floodwaters can be stored and slowly released over a longer period of time. This in turn will also improve water quality on this site and downstream.

3.6.3 *Environmental Impacts – Alternative 2*

The only perennial stream on the allotment is Pumpkin Creek which flows through the North, Middle, and Double Crossing pastures. Under this alternative, the only grazing that would occur in these three pastures is prescriptive grazing. See 3.5.3 for a definition of prescriptive grazing. The typical impacts to water resources from grazing (removal of riparian vegetation, soil compaction, excess sediment load, etc.) would not be expected to occur with prescriptive grazing. The differences in impacts from no grazing and prescriptive grazing would be negligible, as prescriptive grazing is expected to have the same impacts as no grazing. See the No Action Alternative (Section 3.6.2) for effects to the water resources within the North, Middle, and Double Crossing pastures.

Under this alternative there would be one grazing authorization for the allotment west of Highway 59. These nine pastures consist mainly of intermittent/ephemeral drainages. Horse Creek retains some water in intermittent pools in the lower reaches of the creek. As the health of riparian vegetation increases or decreases, so does water quality and quantity. Therefore, impacts to water resources on these nine pastures would be analogous to those stated in Section 3.5.3. See Section 3.5.3 for more details on the impacts from grazing.

Offsite water sources and design features to encourage livestock to move out of the aquatic zone would be the same as discussed in Section 3.5.3.

Allowing the riparian vegetation to recover and maintain would improve water quality and quantity as riparian vegetation provides many ecosystem services such as filtering sediment and stabilizing banks. This would also decrease the number of contaminants in the water that would migrate downstream.

3.6.4 *Environmental Impacts – Alternative 3*

Impacts to water resources within the North, Middle, and Double Crossing pastures would be the same as Alternative 2, please see Alternative 2 (3.6.3) for impacts to water resources within these three pastures.

Under this Alternative there would be two grazing authorizations, a 4-pasture and a 5-pasture system for portions of the allotment west of Highway 59. The 4-pasture rest rotation system includes most of the aquatic habitat on the allotment. Because of the connection between the condition of riparian areas and water quality and quantity, the impacts to water resources on the

portion of the allotment west of Highway 59 would be analogous to the impacts on riparian areas. See Section 3.5.4 for more details on the impacts.

The current condition of the aquatic habitat within the 5-pasture system is uncertain. The days of use in the 5-pasture system are under the maximum recommended amount for all pastures except one (Upper Prat Creek pasture). Effects to aquatic areas (if present) within the 5-pasture system from grazing would be similar to effects within the 4-pasture system, but slightly less degrading to the aquatic area. The degradation that can occur would be dependent on the length of time the cattle stay, and what the climatological impacts (precipitation and temperature variation) are for that particular year.

Offsite water sources and design features to encourage livestock to move out of the aquatic zone would be the same as discussed in Section 3.5.3.

Allowing the aquatic zone to recover and maintain would protect aquatic habitat as riparian vegetation provides many ecosystem services such as filtering sediment, stabilizing banks, and providing a food source for aquatic species.

3.6.5 *Environmental Impacts – Alternative 4*

Impacts to water resources within the North, Middle, and Double Crossing pastures would be the same as Alternative 2, please see Alternative 2 (3.6.3) for impacts to water resources within these three pastures.

This Alternative would designate the portion of the allotment west of Highway 59 a Reserve Common Allotment (RCA) and would be separated into two grazing rotation systems, a 3-pasture deferred, and a 6-pasture deferred. Grazing would alternate between the two systems yearly, leaving one system to be rested each year (unless a need arises from an emergency). The 3-pasture system includes most of the aquatic habitat on the allotment. The days of use for each pasture within the 3-pasture system are less than in Alternative 3 but more than Alternative 2. As stated before, livestock tend to utilize aquatic areas more heavily than uplands. Increasing the number of days spent in a pasture can increase the impacts on the aquatic and riparian areas and thus water quality. The same tools would be utilized under this alternative as discussed in Alternative 2 to facilitate livestock movement into the uplands such as offsite water and placements of supplements away from water and riparian areas. The days of use within the 6-pasture system are very similar to the days of use in Alternative 2, so the impacts would be similar as well. The herbaceous riparian vegetation (within the 3-pasture system and any present in the 6-pasture system) would be expected to improve under this alternative and therefor improve the aquatic zone(s). Cottonwood and willow seedlings (if present) would be expected to recruit and become established in the riparian areas, and therefore have a stabilizing effect on the aquatic zone.

In the event of an emergency (e.g. wildfire) the rested pastures in the RCA would be made available to those affected by the emergency. Use of the rested RCA pastures would follow the normal grazing system that is used on alternate years (either 3-pasture deferred, or 6-pasture deferred). There would not be any season long use or overuse during an emergency. Monitoring

of riparian areas would still occur, as described in Section 3.5.5, prior to authorizing a temporary permit under category 3 (Appendix H).

With the planned rotation, design features (placement of supplements), and the management option to rest pastures for resource concerns the water resources would be expected to improve under this alternative. Allowing the riparian areas to improve would in turn improve the aquatic habitat. Allowing woody vegetation time to recruit and establish would greatly improve riparian areas and aquatic habitat as woody vegetation provides additional stream bank stabilization, other food sources and cover for aquatic species, and would eventually provide instream structure and habitat.

3.6.6 *Environmental Impacts – Alternative 5*

Impacts to water resources within the North, Middle, and Double Crossing pastures would be the same as Alternative 2, please see Alternative 2 (3.6.3) for impacts to water resources within these three pastures.

This Alternative would split the portion of the allotment west of Highway 59 into a Reserve Common Allotment (RCA) and one grazing authorization. The RCA would consist of Dry Divide, Pine Hill, and Jack Divide pastures and would follow a 3-pasture rest rotation. The 3-pasture system includes most of the aquatic habitat on the allotment. The duration of use would range from 62 to 81 days. As stated in previous alternatives, the duration of use is a major function in the intensity of the impacts to the aquatic areas and hence water quality and quantity because cattle utilize aquatic areas more heavily than uplands (Armour et al. 1994). Allowing livestock to graze in one pasture for 62 to 81 days increases re-grazing of vegetation and increases time spent in aquatic areas. Because of the connection between the condition of riparian areas and water quality and quantity, the impacts to water resources on the portion of the allotment west of Highway 59 would be analogous to the impacts on riparian areas. See Section 3.5.6 for details on the impacts to riparian areas under this alternative.

In the event of an emergency (e.g. wildfire) the RCA pastures would be available for use to those affected by the emergency (if not currently permitted on a temporary permit). In the case of an emergency all three pastures would be available to accommodate one herd for that season.

The second half of the allotment would be grazed as a 6-pasture rest rotation. The current condition of the aquatic habitat in these six pastures is uncertain. Again, because of the connection between the condition of riparian areas and water quality and quantity, the impacts to water resources on these six pastures would be analogous to the impacts on riparian areas. See Section 3.5.6 for details on the impacts to riparian areas under this alternative.

Offsite water sources and design features to encourage livestock to move out of the aquatic zone would be the same as discussed in Section 3.5.3.

3.6.7 *Cumulative Effects*

For this proposal, the cumulative effects analysis area would be the Pumpkin Creek Allotment.

Within the Pumpkin Creek Allotment the BLM has future restoration plans for restoring the processes and attributes that historically sustained the health of the riparian and aquatic zone along Pumpkin Creek in the North, Middle, and Double Crossing pastures (under separate NEPA process). Pheasants Forever and MTFWP will continue with their restoration plans for the uplands and riparian areas within the North and Middle pastures (NEPA # DOI-BLM-MT-C020-2012-0192-EA). At some point in the future the Pine Hill Reservoir will be inspected for viability of supporting sport fish. If the reservoir is found capable of supporting sport fish a plan would be worked out with MTFWP to stock the reservoir. Cumulative impacts to water resources from these ongoing and reasonably foreseeable actions would be the same as cumulative impacts described for riparian areas under all alternatives. See Section 3.5.7 for cumulative effects to water resources.

3.7 Resource Issue 7 – Fish and Aquatic Species' Habitat

3.7.1 *Affected Environment*

The only fish bearing stream on the allotment is Pumpkin Creek which flows through the North, Middle, and Double Crossing pastures. Pumpkin Creek is one of the larger prairie streams found in Eastern Montana, approximately 171 miles long from headwaters in Powder River County to the confluence with the Tongue River in Custer Co. The portion of Pumpkin Creek flowing through the allotment is approximately eight stream miles long. Pumpkin Creek supports a myriad of wildlife species throughout its range, to include fish, amphibians, reptiles, birds, big game, small game, and non-game wildlife species. A total of 27 species of fish (20 native), five amphibians, and three reptiles have been observed at the four monitoring sites along the eight-mile section of Pumpkin Creek on the allotment (Table 3 in Appendix F).

In order to have quality aquatic habitat for fish and other aquatic species you need to have a healthy, properly functioning riparian area. Riparian areas are an integral part of maintaining fish habitat because they act as buffers between uplands and the aquatic environments and create, shape, and influence the stream channel and all instream characteristics. Riparian vegetation traps sediment which builds and stabilizes stream banks, reduces erosion, and improves water quality by filtering out sediments and contaminants (Fitch and Ambrose 2003). Overhanging riparian vegetation moderates water temperature and provides thermal refuge. When riparian vegetation senesces and falls into the stream, it adds cover, habitat complexity, and a source of organic nutrients and food items for the prairie ecosystem (BLM 1992 Manual 1737). A resilient riparian area, one that can bounce back from disturbances (floods, grazing, fire, etc.), consists of multiple species as well as multiple age classes of each species. Multiple age classes are especially important when it comes to trees and shrubs. The entire lifecycle of riparian trees and shrubs are used by all fish and terrestrial aquatic species. Saplings to mature stands along the bank provide bank stabilization, thermal buffers, and water quality regulation for fish and other aquatic species. The down wood provides homes to small mammals and insects, sunning spots for reptiles, and aids in erosion control. Instream wood slows stream flow, creates pools and riffles (fish spawning habitat), rebuilds gravel beds, and provides hiding and feeding spots for fish (Logan 1997). With multiple age classes there will be new recruitment to replace the old stands of trees and continue providing the important ecosystem services listed above.

A legacy of land-use effects (channelization of the stream, spreader dikes, season-long grazing) have left this portion of Pumpkin Creek lacking in riparian tree and shrub diversity, with little to no recruitment of riparian trees and shrubs, reduced riparian buffers, and a diminished floodplain size and functionality, all resulting in poor to marginal fish habitat. Most of Pumpkin Creek on the allotment is structurally starved and incised, similar to a stage 2 stream channel (Cluer and Thorne, 2013). The downstream section of Pumpkin Creek (Reach 1, see Map 2 in Appendix E) has shown some improvement in stream evolution since acquisition. After acquisition in 2009, the allotment did not receive grazing from 2010 to 2017, other than one authorization in 2014. Cross section data from the Reach 1 area shows the stream channel is degrading and widening, transitioning from a stage 2 to a stage 3 or 4 channel (Cluer and Thorne, 2013). The Reach 2 and Reach 3 sections of Pumpkin Creek have shown very little to no improvement with passive restoration (no grazing) alone.

3.7.2 *Environmental Impacts – No Action Alternative*

Under this alternative grazing would not be authorized. No grazing, or removing grazing, is a type of passive restoration technique. Some areas along Pumpkin Creek where hydric soils are present along with native herbaceous species that possess rhizomatous root systems capable of recolonizing bare soils have been receptive to passive restoration techniques (no grazing) and are showing signs of recovery. These areas would continue to recover under this alternative. However, in severely degraded areas where hydric soils have been lost (lowered water table) due to extensive soil compaction, pugging or down cutting there has not been much, if any, signs of improvement of stream characteristics such as aggradation of stream bed to create suitable width to depth ratios, new floodplain development, etc. Most of Pumpkin Creek on the allotment is structurally starved and incised. Although the removal of grazing would allow for the stream evolution process to continue, the healing process in a structurally starved, incised channel can take decades to centuries to reach a recovered or desired state in stream evolution. Active restoration techniques coupled with passive (no grazing) techniques can accelerate the healing process.

Overall improvements to fish and aquatic species'; habitat would follow suit with improvements to riparian areas and water resources. Improved riparian areas (Section 3.5.2) would stabilize stream banks, provide shade (regulate water temperatures) for fish and other aquatic species, provide a food source for omnivore species, and filter out sediments and runoff from the uplands which would improve water quality. As Pumpkin Creek reaches a desired stage in the stream channel evolution, the functionality of the floodplain would improve thereby improving water quantity and quality (Section 3.6.2). Improved water quality and quantity would improve fish and other aquatic species' habitat as well.

3.7.3 *Environmental Impacts – Alternative 2*

As stated in the Affected Environment, the majority of the aquatic habitat and all the fish habitat are withing the North, Middle, and Double Crossing pastures. Under this alternative, the only grazing that would occur in these three pastures is prescriptive grazing. Prescriptive grazing would occur infrequently, livestock would be confined to specific areas of the pastures to accomplish the desired vegetation treatment and would generally occur in very short durations.

Any prescriptive grazing that would occur within these three pastures would also follow Best Management Practices (BMPs) for grazing uplands and riparian areas (e.g. Bellows 2003). The typical impacts to fish and aquatic habitat from grazing (browsing of woody vegetation, soil compaction, trampling, destabilizing banks, etc.) would not be expected to occur with prescriptive grazing. The impacts from prescriptive grazing are expected to be the same as no grazing. See the No Action Alternative (Section 3.7.2) for effects to fish and aquatic habitat with the North, Middle, and Double Crossing pastures.

Aquatic habitat within the nine pastures on the west side of Highway 59 is limited to Horse Creek and several reservoirs scattered throughout the allotment. The quality of aquatic habitat found within these pastures is marginal. See the Affected Environment sections for Riparian and Wetland Areas and Water Resources (3.5.1 and 3.6.1) for a description of the current condition of the riparian areas and water resources. Riparian vegetation and water quality and quantity are important factors in aquatic habitat. Riparian areas provide a food source and shelter for aquatic amphibians and reptiles, and act as a buffer between the aquatic habitat and the uplands, filtering out contaminants and sediment. Impacts under this alternative to aquatic habitat would be similar to impacts described for riparian areas and water resources (3.5.3 and 3.6.3) for aquatic habitat within the nine pastures on the west side of Highway 59.

3.7.4 *Environmental Impacts – Alternative 3*

Impacts to the fish and aquatic habitat within the North, Middle, and Double Crossing pastures would be the same as the No Action Alternative and Alternative 2, please see Section 3.7.2 for impacts to fish and aquatic habitat in these three pastures.

Water, riparian, and wetland areas make up the habitat for aquatic species such as amphibians, aquatic reptiles, and insects. Impacts to riparian vegetation and water resources from Alternative 3 have already been described in previous sections. See sections 3.5.4 and 3.6.4. for impacts to aquatic species' habitat on the portion of the allotment west of Highway 59.

3.7.5 *Environmental Impacts – Alternative 4*

Impacts to the fish and aquatic habitat within the North, Middle, and Double Crossing pastures would be the same as the No Action Alternative and Alternatives 2 and 3, please see Section 3.7.2 for impacts to fish and aquatic habitat in these three pastures.

Water, riparian, and wetland areas make up the habitat for aquatic species such as amphibians, aquatic reptiles, and insects. Impacts to riparian vegetation and water resources from Alternative 3 have already been described in previous sections. See sections 3.5.5 and 3.6.5. for impacts to aquatic species' habitat on the portion of the allotment west of Highway 59.

3.7.6 *Environmental Impacts – Alternative 5*

Impacts to the fish and aquatic habitat within the North, Middle, and Double Crossing pastures would be the same as the No Action Alternative and Alternatives 2, 3, and 4, please see Section 3.7.2 for impacts to fish and aquatic habitat in these three pastures.

Water, riparian, and wetland areas make up the habitat for aquatic species such as amphibians, aquatic reptiles, and insects. Impacts to riparian vegetation and water resources from Alternative 3 have already been described in previous sections. See Sections 3.5.6 and 3.6.6. for impacts to aquatic species' habitat on the portion of the allotment west of Highway 59.

3.7.7 *Cumulative Effects*

For this proposal, the cumulative effects analysis area would be the Pumpkin Creek Allotment. Within the Pumpkin Creek Allotment the BLM has future restoration plans for restoring the processes and attributes that historically sustained the health of the riparian and aquatic zone along Pumpkin Creek in the North, Middle, and Double Crossing pastures (under separate NEPA process). Pheasants Forever and MTFWP will continue with their restoration plans for the uplands and riparian areas within the North and Middle pastures (NEPA # DOI-BLM-MT-C020-2012-0192-EA). At some point in the future the Pine Hill Reservoir will be inspected for viability of supporting sport fish. If the reservoir is found capable of supporting sport fish a plan would be worked out with MTFWP to stock the reservoir.

No grazing, along with the active restoration activities, is expected accelerate the healing process to improve the riparian areas, along with other stream channel characteristics. Healthy riparian areas improve fish habitat by stabilizing banks, reducing sediment loads, providing shade and thermal refuge, providing a food source, and eventually structure in the stream which adds dynamics to fish habitat. All Action Alternatives would only utilize prescriptive grazing in the three pastures with restoration activities. Because prescriptive grazing is expected to have the same impacts as no grazing, the cumulative effects under all action alternatives would be the same as the No Action Alternative.

Cumulative impacts to aquatic species' habitat from stocking the reservoir would be the same as the cumulative impacts described for riparian areas under all alternatives. See Section 3.5.7.

3.8 Resource Issue 8 – Soil Erosion

3.8.1 *Affected Environment*

The Pumpkin Creek Allotment (PCA) is in Major Land Resource Area (MLRA) 58A (Northern Rolling High Plains, Northern Part). This MLRA is described as an elevated piedmont plain dissected by numerous rivers (USDA 2006). The mean annual precipitation is 10"-15", with much of that occurring in the spring and winter as well as late summer thunderstorms. The mean annual soil temperature is 39-45ºF, and averages 122 frost free days (NRCS 2020).

More specifically, the soils within the PCA are dominated by Entisols and Inceptisols, weathered from alluvium and residuum. They are shallow to very deep, well drained, with surface textures ranging from clayey to loamy. These soils are found on slopes ranging from 0 to 70 percent (averaging less than 30%); they have a frigid temperature regime and vary from aridic to ustic moisture regimes. The mineralogy varies from mixed to smectitic. The landscape varies from gently rolling or rolling slopes with flat-topped, steep-sided buttes and/or badlands occurring in

some locations (USDA. 2006). None of this area is prime farmland; native vegetation consists primarily of short grass prairie species, generally consisting of western wheatgrass, bluebunch wheatgrass, little bluestem, green needlegrass, and needleandthread (USDA 2006).

There are 56 Natural Resource Conservation Service (NRCS) (2020) mapped soils within the PCA. Table 4 (Appendix F) indicates the soil type, approximate acres, percent of PCA, farmland classification, and fire damage susceptibility within this management area.

Land health assessments conducted in 2011 indicate that the overwhelming majority of the allotment is achieving land health standards for soil and site stability. Following these land health assessments and prior to 2017, the allotment has not been grazed with the exception of a single grazing authorization in 2014.

3.8.2 *Environmental Impacts – No Action Alternative*

Under this alternative, impacts to soils include the stabilization of soils along livestock trails and around water sources as vegetation would increase in these previously disturbed areas without the presence of livestock grazing. This alternative could also lead to an eventual reduction in plant production as many species of grass present in the allotment have evolved with moderate grazing and need disturbance from grazing to maintain health and vigor.

Generally, a lack of grazing has the potential to increase fuel loads and subsequent catastrophic effects from wildfire, however the soils within the pumpkin creek allotment, with the exception of riparian areas, are generally too xeric, the grasses too short, interstitial spaces between individual plants larger, and the biological activity in the soil adequate for excess amounts of litter to be produced. There is a potential for increased fuel loading from a lack of grazing in mesic locations along riparian corridors, which could lead to conditions favoring damage from catastrophic wildfire, however; these areas are isolated and unlikely to be a location for wildfire ignition.

3.8.3 *Environmental Impacts – Common to All Action Alternatives*

There are two major soil concerns within the MLRA and the PCA; they include wind and water erosion (where overgrazing/trampling has led to reduced surface vegetation), and the invasion of nonnative and/or deleterious plant species. Both concerns decrease productivity, health, and vigor of native species and increase the potential for invasion by nonnative and/or deleterious invasive plants, amplifying the wildfire hazard. Additionally, these concerns can lead to a reduction in surface and ground water quality through the transport of sediment, nutrients, and organic matter.

- Impacts in the North, Middle, and Double Crossing pastures would include stabilization of previously disturbed soils around water sources and along cattle trails, as these pastures would only be grazed on a prescriptive basis designed to enhance ongoing reclamation efforts.

- Placement of supplements within the allotment has the potential to affect the soils surrounding the placement site. These areas would see increased use of livestock which would lead to increased trampling and grazing of vegetation adjacent to the supplement.

Supplements are generally placed near water troughs and pits, which already see concentrated use. Assuming that each water source (40 in total) has a supplement placed near it, and an impacted area approximately 20 feet in diameter per supplement location, the total affected area from supplement placement is expected to be approximately 0.29 acres. Placement of supplements away from water sources would not decrease use of the water sources, but it would add approximately 0.29 acres of additional concentrated use away from water sources. The proposed action requires that the placement of supplements be approved in advance. Supplements should be placed at least 0.25 miles from riparian and/or wetland soils

- Potential impacts to the soils on the west side of Highway 59 within the PCA could include erosion, compaction, soil mixing, and the increase/establishment of nonnative and/or deleterious plant species, all of which would reduce soil productivity and nutrient cycling. Disturbed soils would be locally and permanently impacted. However, many of the biological, physical, and chemical properties of the soil would be preserved by the application of appropriate stocking rates and correct season of use for individual pastures.

- Ground cover (vegetation) removal would result in more of the soil surface being exposed to sunlight, potentially increasing soil temperatures, reducing available moisture and subsequently reducing germination potential. Ground cover removal also allows a higher number of raindrops to hit the soil surface increasing the chance of soil particles, litter, and nutrients being dislodged and transported downslope. Additionally, decreased surface cover increases the potential for wind erosion, exacerbating the chance of soil and nutrient loss. Excessive ground cover removal from grazing could occur in and/or adjacent to watering, loafing, and mineral supplement areas such as troughs, pit, reservoirs, and shaded riparian areas, and will be discussed under each alternative.

- Soil compaction increases runoff, resulting in an increased chance of erosion and affects soil temperature, which in turn affects the activity of soil organisms, decreasing the rate of decomposition of organic matter, and subsequently the release of nutrients from this organic matter. When livestock, especially bulls, spend excessive time in loafing areas where soils are moist or wet (e.g. riparian areas and wetlands) can cause shallow soil compaction. This compaction can be relieved through natural action, such as freeze-thaw cycles and/or deep root penetration.

- Mixing of soil horizons could occur in riparian and wetlands areas where the soils are moist enough for the livestock to create tussocks or hummocks. and could affect the productivity of surface flora and affect subsurface flora and fauna. Mixing can result in the movement of organic matter and nutrients to depths that are out of reach of surface vegetation. Mixing could also bring soluble salts or un-weathered material to the surface, affecting soil and plant health. Surface flora is dependent on conditions created by soil organisms and organic matter, which may be destroyed due to exposure to surface conditions, subsequently depleting available nutrients. Additionally, soil mixing may bring inorganic compounds, such as carbonates and other salts, to the surface, affecting germination rates, seedling recruitment and overall plant health and viability.

3.8.4 *Environmental Impacts – Alternative 2*

Under this alternative, pastures would receive the least amount of time for the recovery of vegetation, which protect soil from erosion and allows for the recovery from compaction. Additionally, this alternative would not protect riparian/wetland areas on the west side of the highway, increasing the chance for soil mixing, compaction, and erosion, which increases the chance of riparian/wetland sedimentation.

Impacts to soils in this alternative would depend on the class of livestock. Yearlings tend to travel farther from water and fences, therefore trampling in and around riparian/wetland areas and around stock water tanks and trailing along fences would be less. Cow calf pairs tend to travel fences and hang around water sources increasing trailing and trampling at these locations, while bulls tend to hang around water sources and loafing areas, creating areas where trampling is increased and the potential for erosion is increased. Under this alternative the range conditions would be expected to decrease from the expected potential climax community, although they would still be expected to meet rangeland health standards, which would support, but not enhance soil health.

3.8.5 *Environmental Impacts – Alternative 3*

Impacts are similar to alternative 2, however this alternative nearly doubles the frequency of rest, resulting in better recovery for native vegetation and subsequently soil health.

3.8.6 *Environmental Impacts – Alternative 4*

Impacts are like alternative 2, however the further increase in frequency of rest would allow for the enhancement of soil health. This alternative allows for the most rest between grazing cycles, which allows for the enhancement of soil health through the relief of compaction, a decreased potential for soil mixing, and a decrease in both wind and water erosion, due to an increase in native vegetation. This alternative also allows for the flexibility of not grazing if a problem is noticed or a specific pasture needs additional rest to enable the enhancement of any resource.

3.8.7 *Environmental Impacts – Alternative 5*

Under this alternative the impacts to the west side of Highway 59 would be similar to alternative 3 on years when the RCA portion of the allotment is permitted and grazed. However, on years that the RCA portion of the allotment is not grazed it would be more similar to alternative 1 as these pastures would not be grazed. Additionally, similar to alternative 4, this alternative also allows for the flexibility of additional longer rest periods in the RCA portion, if a grazing related problem arises.

3.8.8 *Cumulative Effects*

Reasonably foreseeable future actions include the ongoing PF and MTFWP restoration to the upland portions of the pastures on the east side of Highway 59. Additionally, the BLM is planning on the restoration of Pumpkin Creek to mimic a Stage 0 stream system within the North, Middle, and Double Crossing pastures. With these restoration efforts planned, the BLM expects a cumulative net positive effect on both the upland and riparian/wetland soil within these pastures. These effects are expected with both the no action and action alternatives; however, the action alternatives provide the BLM with the additional tool of grazing to mitigate any potential

negative effects from an increase in vegetation litter.

The Pine Hill Reservoir (in the Pine Hill pasture) will be inspected for viability of supporting sport fish. If this reservoir is stocked for the benefit of the public, it would also likely be fenced to exclude livestock use. Fencing of this reservoir would allow for the improvement of the surrounding vegetation which would subsequently improve soil health through the reduction of compaction and erosion. There would be no additional improvement under the no action alternative, as grazing would not be authorized under this alternative. In alternatives 2-5, the riparian/wetland and surrounding upland soil health would be improved if the reservoir is fenced.

4 Consultation and Coordination

4.0 Summary of Consultation and Coordination

4.1 Summary of Public Participation

A scoping period for this project began on March 9, 2020 and concluded on March 23, 2020. On March 9, 2020 the BLM published public notice on the national NEPA Register (ePlanning) website, social media (BLM Facebook page), and in the following newspapers: *Billings Gazette, Great Falls Tribune, Glendive Ranger, Sidney Herald,* and others (see Table 1 in Appendix F). The social media post reached 1,090 individual Facebook pages with 26 engagements (e.g. clicking on post, commenting on post, etc.). The BLM received six (6) comments submitted online through the ePlanning website and four (4) comments in hard copy format. See Table 1 in Appendix G for a summary of scoping comments and responses.

A letter announcing the availability of the Pumpkin Creek Management Plan EA for public comment has been mailed to those who submitted an Interest Response Form or provided comments during scoping. A public notice will be posted on the national NEPA Register (ePlanning) website and sent to the following newspapers: *Billings Gazette, Great Falls Tribune, Glendive Ranger, Sidney Herald,* and others (see Table 1 in Appendix F) to notify the public of the availability of the Pumpkin Creek Management EA for public comment. This EA will be available for a 30-day public comment period.

4.1.1 *Tribal Consultation*

The BLM Miles City Field Office (MCFO) mailed letters on March 18, 2020 to 15 Tribal Chairs and 15 Tribal Historic Preservation Offices (THPO) describing the preliminary proposal to develop alternative management scenarios to address the availability of forage for the Pumpkin Creek Allotment and gave the Tribes an early opportunity to express concerns or issues with the project. The BLM did not receive a response during scoping from the 15 Tribal Chairs or THPO. A second mailing indicating the availability of the Environmental Assessment for comment on ePlanning for our developed alternatives and preliminary impacts analysis was sent concurrent with the release of this EA for comment. This EA will be available for a 30-day comment period.

4.1.2 *State Historic Preservation Office*

The BLM MCFO initiated consultation with the State Historic Preservation Office (SHPO) by letter on *xx/xx/xxxx*

4.1.3 *State Agencies and Non-governmental Organizations*

The BLM MCFO has been coordinating with MT Fish, Wildlife, and Parks and the Tongue River Chapter of Pheasants Forever to ensure compliance with our Memorandum of Understanding (MOU) and to ensure the terms of the Upland Game Bird Enhancement Program (UGBEP) contract are being met.

5 List of Appendices

6 Appendix A: List of Preparers

Name	Title	Resource Area
Christina Stuart	Fish Biologist	Project Lead Fish and Aquatic Species
Dawn Doran	Rangeland Management Specialist	Upland Health and Vegetation, Grazing Administration, Livestock Grazing
Chris Morris	Environmental Protection Specialist	Water, Riparian Areas, Wetland Areas
Josh Buckmaster	Soil Scientist	Soils
Fiona Petersen	Wildlife Biologist	Wildlife
Paul Pauley	Fire Management Specialist	Fire Management
Dena Lang	Outdoor Recreation Planner	Recreation/VRM
Brenda Witkowski	Weed Supervisor	Weeds
CJ Truesdale	Lead Archeologist	Cultural/Paleo
Scott Rickard	Economist	Socioeconomics

7 Appendix B: Table of Issues Considered

Determination*	Issue	Rationale for Determination
NI	Air Quality	No direct impacts are anticipated because there is no physical disturbance with these alternatives.
NP	Areas of Critical Environmental Concern	The Allotment is not in or near a designated ACEC.
PI	Cultural Resources	Project Numbers: MT-020-20-XX & MT-020-20XX
NP	Environmental Justice	
NI	Fire Management	Fire risk is extremely difficult to quantify. In this fuel type "fire risk", or the potential for a fire to start and then the intensity with which the resulting fire burns with is mainly dependent on environmental factors. Grazing at an acceptable level to meet BLM goals and objectives would have little impact on "fire risk". This analysis includes grazing in every alternative except the No Action Alternative, because there are minimal differences in the differences between grazing and no grazing there is no need to determine the impacts of no grazing on fire hazard. No matter which Alternative is selected the BLM is currently developing an EA that would authorize Fuels treatments in the project area to mitigate fire risk in this area. High Density Recreational Use Locations: Hazardous Fuels and Fire Danger Reduction Project NEPA#: DOI-BLM-MT-C020-2020-XX

Determination*	Issue	Rationale for Determination
PI	Fish and aquatic Habitat	The only fish habitat in the allotment is Pumpkin Creek. Under all Action Alternatives the forage available in the pastures with fish habitat (North, Middle, and Double Crossing pastures) would not be allocated with the rest of the allotment for grazing. The forage would be used on a prescriptive basis only when needed to complement the restoration projects ongoing (under separate NEPA) in these three pastures. Minimal aquatic habitat for other aquatic species exists on the rest of the allotment and will be described in the EA.
NP	Floodplains	No FEMA listed floodplains within the allotment
PI	Forests and Rangelands	Forests are not present; however, rangelands will be analyzed in the EA.
NP	Forestry Resources and Woodland Products	There are no forestry related issues associated with this proposal
NI	Human health and safety concerns	
NI	Invasive, Non-native Species	Weeds (non-native and invasive) are present on the allotment. The BLM will continue to inventory, treat, and monitor weed infestations. The developed alternatives (grazing plans) would not affect the presence of weeds. Therefore, weeds will not be analyzed in detail in the EA.
NI	Lands and Realty	No impacts would occur to existing land use authorizations.

Determination*	Issue	Rationale for Determination
NP	Lands with Wilderness Characteristics	There are no lands with wilderness characteristics present in the project area
PI	Livestock Grazing Management	Will be analyzed in the EA
PI	Migratory birds and wildlife	Will be analyzed in the EA
NI	Native American Religious Concerns	
NI	Paleontological Resources	Project area fall within PFYC significant geologic formation. See Section 1.7.1.
NI	Recreation Resources	There would not be any substantial changes to the dispersed recreation opportunity or the dispersed recreational experience as a result of the implementation of any of the alternatives. See Section 1.7.6.
PI	Sage Grouse Habitat	Will be analyzed in the EA
PI	Socioeconomics	Will be analyzed in the EA
PI	Soils	Impacts to soils will be analyzed in the EA
NP	Threatened, Endangered or Candidate Plant or Animal Species	There are no Threatened, Endangered, or Candidate Plant or Animal species known or expected to occur in the project area.
PI	Vegetation	Will be analyzed in the EA
NI	Visual Resources	The proposed project is within a VRM Class II. The objective of this class is to not attract the attention of the casual observer. Any surface disturbing projects within the proposed project area will use the visual contrast rating system for mitigation and conservation actions to follow established guidelines for the visual landscape.
NP	Wastes, Hazardous or Solid	There are no known waste or Hazardous material in the allotment.
PI	Water Resources	Will be analyzed in the EA
PI	Wetlands/Riparian Zones	Will be analyzed in the EA

Determination*	Issue	Rationale for Determination
NP	Wild and Scenic Rivers	There are no wild and scenic rivers present within the project area.
NP	Wilderness and Wilderness Study Areas	There are no wilderness or wilderness study areas present within the project area.
PI	Wildlife	Wildlife (upland and riparian bird species, including grouse) will be analyzed in the EA. Other wildlife species are present but would not be impacted to a degree to analyze in detail. All Alternatives would meet wildlife habitat objectives.

*NP = not present in the area impacted by the proposed or alternative actions.

NI = present, but not affected to a degree that detailed analysis is required.

PI = present and may be impacted. Analyzed in affected environment and environmental effects.

8 Appendix C: Acronyms and Abbreviations

ACEC	Area of Critical Environmental Concern
ARMP	Approved Resource Management Plan
AU	Animal Unit
AUM	Animal Unit Month
BGCWR	Big Game Crucial Winter Range
BLM	Bureau of Land Management
BMP	Best Management Practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
DR	Decision Record
EA	Environmental Assessment
EIS	Environmental Impact Statement
ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FLPMA	Federal Land Policy Management Act of 1976, as amended
GHMA	General Habitat Management Area
GIS	Geographic Information Systems
GRSG	Greater Sage Grouse
HUC	Hydrologic Unit Code
IBLA	Interior Board of Land Appeals
IDT	Interdisciplinary Team
IM	Instruction Memorandum
MBTA	Migratory Bird Treaty Act of 1918
MCFO	Miles City Field Office
MLRA	Major Land Resource Area
MOU	Memorandum of Understanding
MTDEQ	Montana Department of Environmental Quality
MTFWP	Montana Fish, Wildlife, and Parks
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OHA	Office of Hearings and Appeals
PCA	Pumpkin Creek Allotment
PF	Pheasants Forever
PFC	Proper Functioning Condition
PFYC	Potential Fossil Yield Classification
RAC	Resource Advisory Council
RCA	Reserve Common Allotment
RMP	Resource Management Plan

SHPO	State Historic Preservation Office
SRP	Special Recreation Permit
SSS	Sensitive Status Species
T&E	Threatened and Endangered
THPO	Tribal Historic Preservation Office
UGBEP	Upland Game Bird Enhancement Program
U.S.C.	United States Code
USGS	U.S. Geologic Survey
VRM	Visual Resource Management
WSA	Wilderness Study Area

9 Appendix D: List of References

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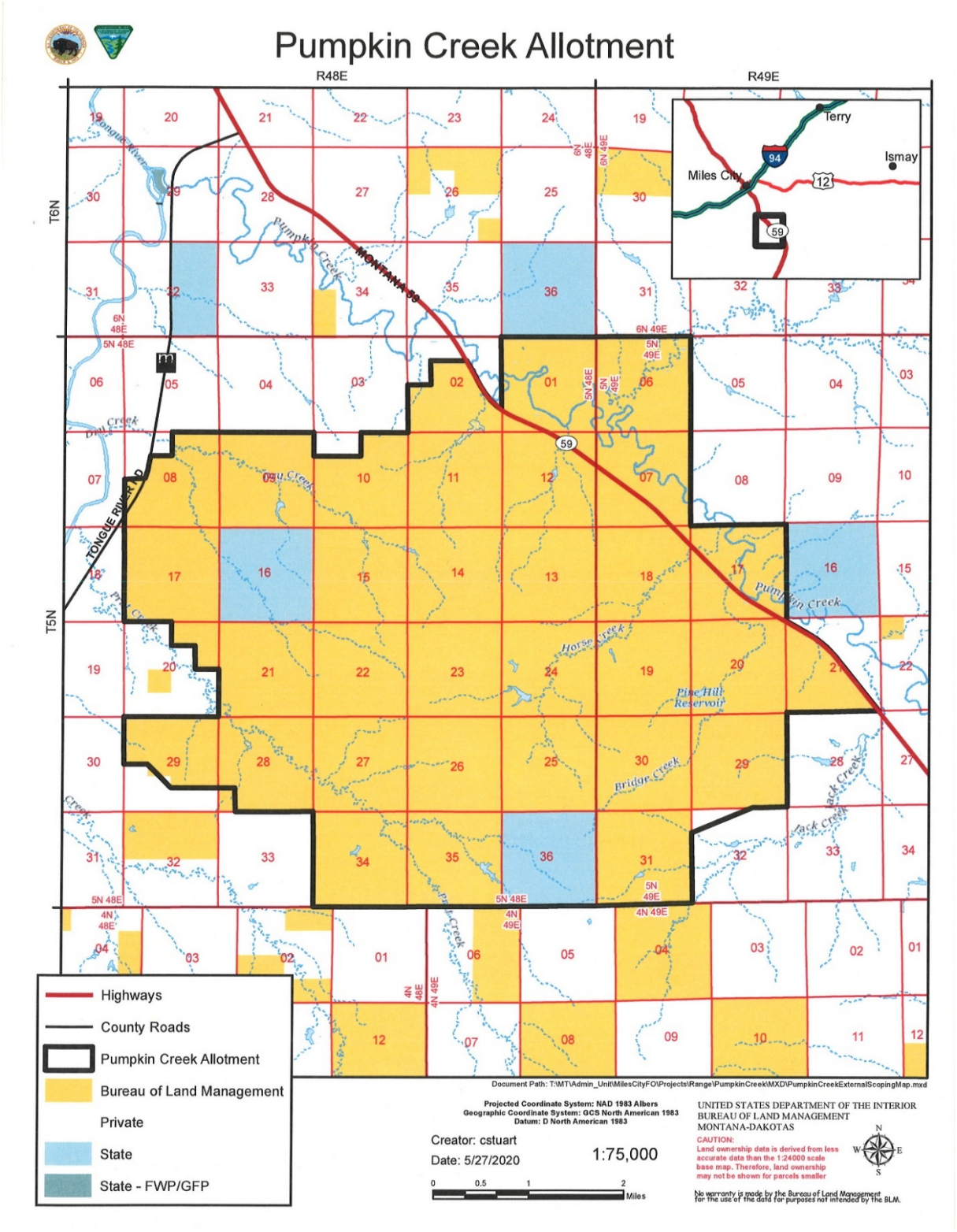
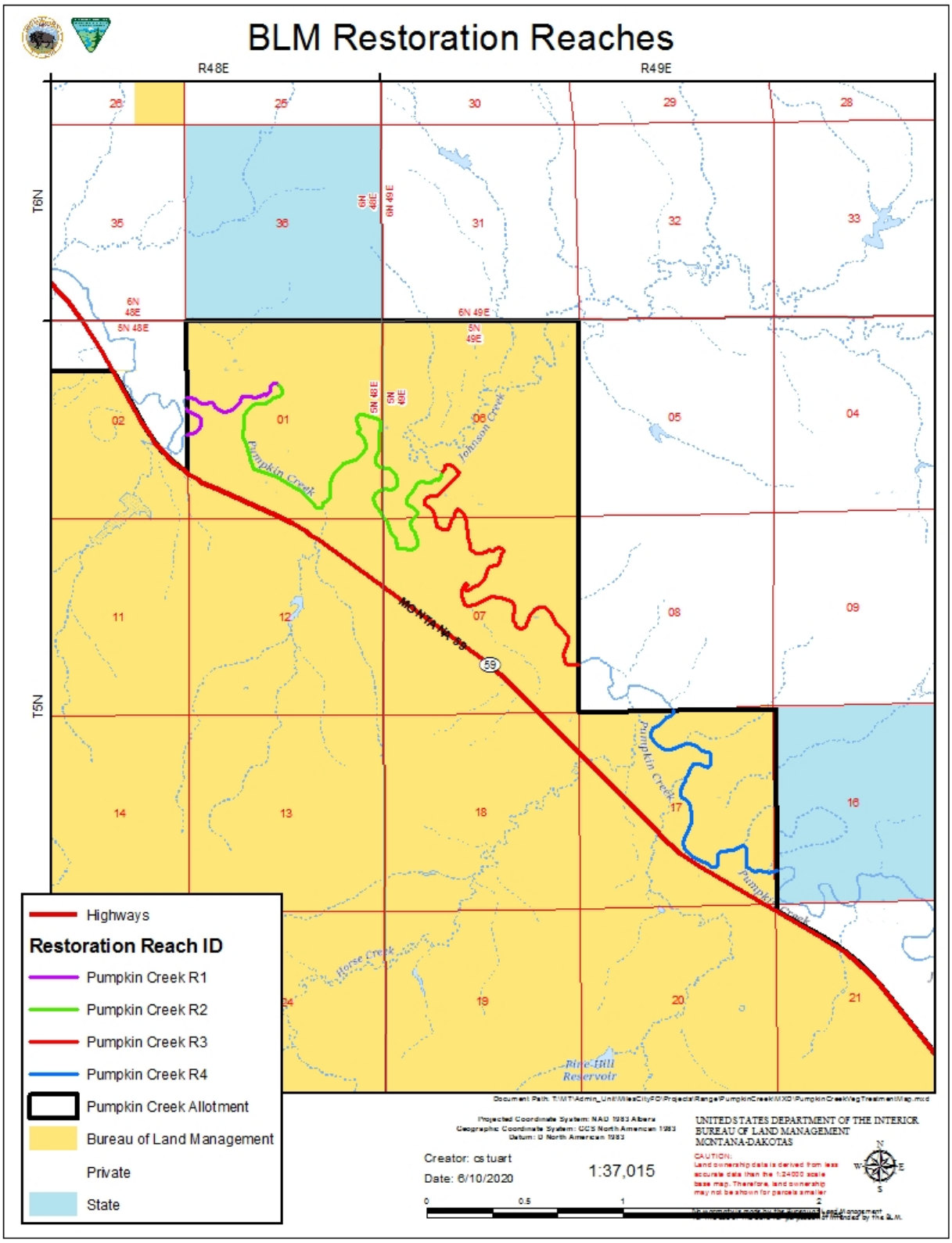
10 Appendix E: Maps

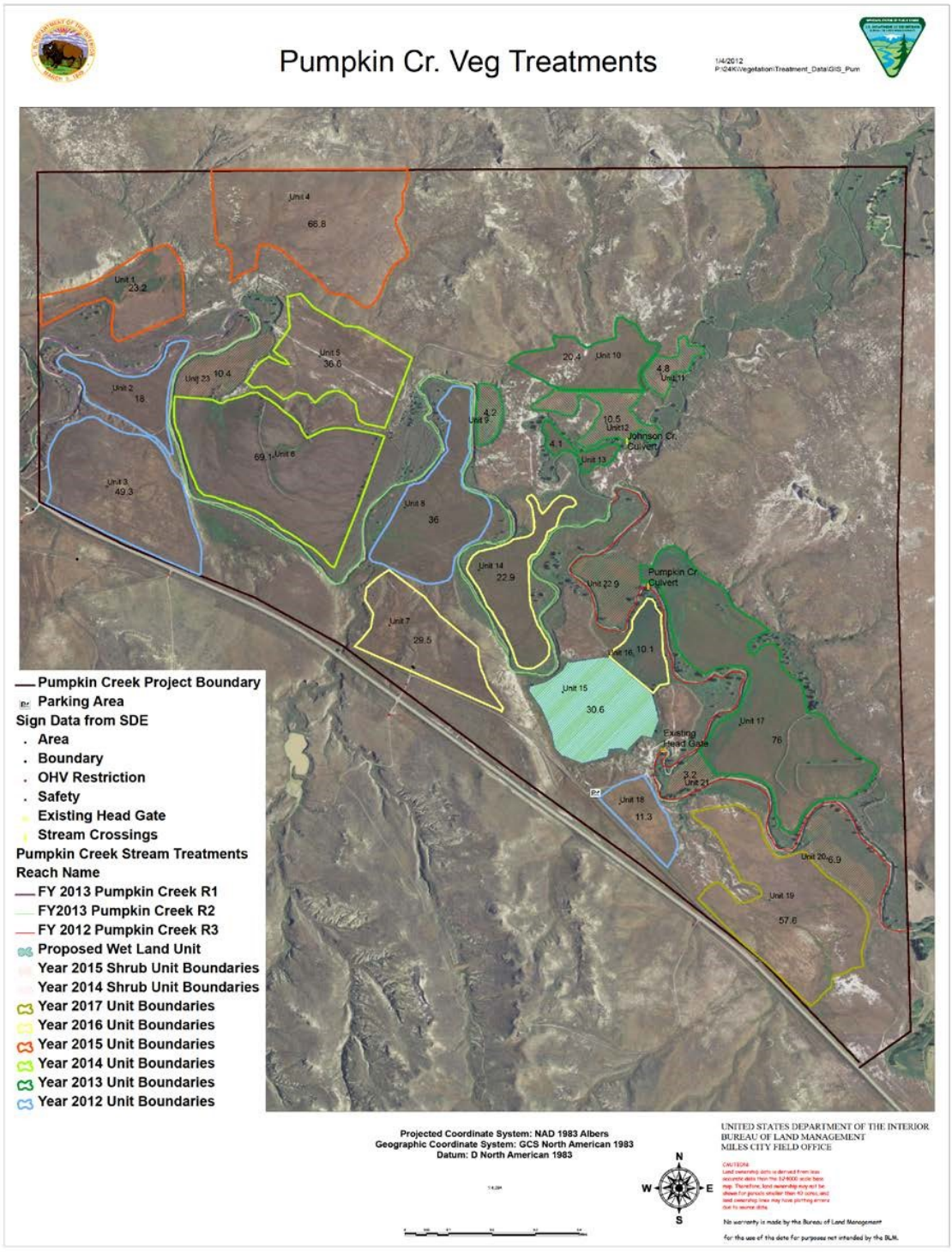
Map 1 – Map of the project area, the Pumpkin Creek Allotment



Map 2 – BLM restoration stream reaches (R1-R4) in the North, Middle, and Double Crossing pastures along Pumpkin Creek where native trees and shrubs were planted, and future restoration would occur.



Map 3 - Map of Restoration Units for the Cooperative Restoration Efforts by MTFWP, PF, and BLM in the North and Middle pastures.



11 Appendix F: Tables

Table 1 – List of Newspapers the BLM sent the scoping notice and comment period to for public participation during the scoping process and to comment on the completed Environmental Assessment.

Newspaper	Location
Bighorn County New	Hardin, MT
Billings Gazette	Billings, MT
Circle Banner	Circle, MT
Ekalaka Eagle	Ekalaka, MT
Fallon County Times	Baker, MT
Forsyth Independent	Forsyth, MT
Glasgow Courier	Glasgow, MT
Glendive Ranger Review	Glendive, MT
Great Falls Tribune	Great Falls, MT
Jordan Tribune	Jordan, MT
MC Star	Miles City, MT
Powder River Examiner	Broadus, MT
Sheridan County News	Plentywood, MT
Sidney Herald	Sidney, MT
Terry Tribune	Terry, MT
The Greeter	Plentywood, MT
The Herald News	Wolf Point, MT
Western Ag Reporter	Billings, MT
Wibaux Pioneer Gazette	Wibaux, MT

Table 2. Issues, concerns, suggested alternatives and terms and conditions raised during internal scoping by the ID Team (Int-ISU-#) and external scoping by the public (Pub-ISU-#).

Generated Internally (IDT) or Externally (Public)	Issues, Concerns, Suggested Alternatives or Terms and Conditions for Alternatives	BLM Response
Recreation		
Pub-ISU-1	Recreation enhancements, Monitor Recreation through sign in and out apps to reduce recreation conflicts	Detailed recreation activity plans are not being considered as part of this grazing EA. Any changes to the recreation status within the project area would be done under another NEPA process.
Pub-ISU-2	Recognizing a high level of hunting activity currently exists and will continue, preclude any Special Recreation Permits authorizing outfitted hunting	Currently, there are no hunting SRPs issued for Pumpkin Creek. Per the ARMP (MD REC 2 and MD REC 3), all SRP applications and renewals will be reviewed on a case-by-case basis and issued as tools to achieve area specific panning goals, objectives, and decisions. In addition, SRPs for outfitters and guides for hunting are allowed where those permits will not conflict with recreation area's goals and objectives.
Pub-ISU-3	Livestock grazing should end prior to the general pronghorn hunting season	All Action Alternatives developed to address the availability of forage have turn out dates in early October (October 1st or 15th) to address this concern. Most years these turn out dates will have livestock off the allotment prior to or within a few days of general hunting season.
Pub-ISU-4	Consider imposing prairie dog shooting season designed to protect non-target species	The BLM will continue working with Montana Fish, Wildlife and Parks with Black-tailed Prairie Dog management. However, prairie dog management is outside the scope of this EA but may be addressed at a later time.
Pub-ISU-5	No off-road vehicles should be permitted	Pumpkin Creek does not have a site-specific travel management plan and per the ARMP (MD TM 2, page 3-33), this area is designated as limited – all vehicle use is limited to existing roads and trail. Specific road and trail designations will be

Generated Internally (IDT) or Externally (Public)	Issues, Concerns, Suggested Alternatives or Terms and Conditions for Alternatives	BLM Response
		made when site-specific travel plan NEPA is undertaken at a future date. All Action Alternatives would add a stipulation to any permit issued for prior authorization for any off-road use needed by that permittee(s) (Section 2.1).
Wildlife and Wildlife Habitat		
Pub-ISU-6	Wildlife restoration should be top priority	The AUMs in the North, Middle, and Double Crossing pastures, that have ongoing wildlife restoration activities, would not be allocated with the rest of the allotment. These AUMs would only be grazed on a prescriptive basis to address this concern. See Section 2.1 Features Common to All Action Alternatives
Int-ISU-1 Pub-ISU-7	Agreement with MT FWP and Pheasants Forever needs to be incorporated into management plan	The AUMs in the North, Middle, and Double Crossing pastures, that have ongoing wildlife restoration activities, would not be allocated with the rest of the allotment. These AUMs would only be grazed on a prescriptive basis to address this concern. See Section 2.1 Features Common to All Action Alternatives
Int-ISU-2 Pub-ISU-8	Manage riparian area to focus on reestablishment of a functional riparian corridor to benefit wildlife and fish	The AUMs in the North, Middle, and Double Crossing pastures, that have ongoing restoration activities, would not be allocated with the rest of the allotment. These AUMs would only be grazed on a prescriptive basis to address this concern. See Section 2.1 Features Common to All Action Alternatives and Section 3.7
Pub-ISU-9	As downed trees provide habitat for many species of non-game wildlife, consider precluding firewood cutting except when imminent human health is at risk	Firewood cutting management decisions are not being made as part of this grazing EA. However, all management activities that would remove dead or live trees will first consider other resource values, such as wildlife habitat.

Generated Internally (IDT) or Externally (Public)	Issues, Concerns, Suggested Alternatives or Terms and Conditions for Alternatives	BLM Response
Pub-ISU-10	Manage and maintain winter cover values and attributes for big game, primarily mule deer	The grazing rotation plan developed in each Action Alternative would address this concern. See Sections 2.3 - 2.6 of the EA (Alternatives 2-5)
Pub-ISU-11	Prairie dog management	See Pub-ISU-4
Pub-ISU-12	Grazing management plan that provides adequate residual cover for upland bird nesting and big game fawning cover	The grazing rotation plan developed in each Action Alternative would address this concern. In all Action Alternatives there will be one or several pastures rested each year to provide plenty of growing season rest. See Sections 2.3 - 2.6 of the EA (Alternatives 2-5). Some design features address this concern as well, see Sections 2.0 and 2.1 of the EA.
Grazing and Vegetation		
Pub-ISU-13	Allow for year by year flexibility in the grazing plan and AUMs allotted	Allowing for year by year flexibility defeats the purpose of having a prescribed rotation plan. However, changes in the grazing season or numbers of livestock, etc. due to drought, fire, water system failure, etc. would be made on an as-needed basis after coordination and approval from the BLM authorized officer. Grazing treatments may also be revised from the original plan if vegetation management objectives are not being met. Revisions to the plan would be done in consultation and agreement with BLM and the allotment operator.
Pub-ISU-14	Use a rest rotation plan	Alternatives developed in the EA will have a rest rotation or deferred rotation plan. See Alternatives 2-6

Generated Internally (IDT) or Externally (Public)	Issues, Concerns, Suggested Alternatives or Terms and Conditions for Alternatives	BLM Response
Pub-ISU-15	Include the use of sheep along with cattle	The allotment does not have sheep tight fencing. Including sheep would require replacing all boundary fences with sheep tight fencing. Sheep fencing is not wildlife friendly. See Section 2.7.2.
Pub-ISU-16	Grazing should not be allowed	The No Grazing Alternative is being considered, see Alternative 1 in the EA. However, the forage is available for grazing in the MCFO ARMP (MD PUMPKIN 3, p.3-20)
Pub-ISU-17	Livestock grazing should only be authorized when it is deemed compatible with other uses	Alternatives were developed to meet resource objectives in the MCFO ARMP. See the Purpose and Need section of this EA.
Pub-ISU-18	No season long grazing unless necessary to maintain or enhance black-tailed prairie dog communities or other habitat	Alternatives were developed to manage this area in conformance with the MCFO ARMP including to address the availability of forage in conjunction with meeting other objectives identified including wildlife habitat and restoration objectives.
Pub-ISU-19	Restrict livestock grazing to no earlier than seed ripe for cool-season grasses and conclude prior to general pronghorn hunting season	See Pub-ISU-18 and Pub-ISU-3
Pub-ISU-20	Limit livestock grazing to a level no more than 75% of capacity	The Miles City ARMP carried forward forage allocations of the Powder River RMP which allocated 25 percent of available AUMs to livestock utilization while the remaining AUMs were available for wildlife, watershed protection and other non-consumptive uses.

Generated Internally (IDT) or Externally (Public)	Issues, Concerns, Suggested Alternatives or Terms and Conditions for Alternatives	BLM Response
Pub-ISU-21	Grazing management plan that benefits and encourages floral species diversity, especially native forb and shrub components and communities	The grazing rotation plan developed in each Action Alternative would address this concern. See Sections 2.3 - 2.6, Alternatives 2-5. Some design features will address this concern as well, see Sections 2.0 and 2.1.
Int-ISU-3 Pub-ISU-22	Minimize fencing needed to implement grazing plan	The only new fence that would be installed under the proposed alternatives is a boundary fence. Two interior fences would be removed in all Action Alternative scenarios. See Alternatives 2-5
Pub-ISU-23	Weed control should be maintained by the BLM	The BLM will continue to inventory, treat, and monitor weed infestations.
Pub-ISU-24	Grazing needed in Unit 1 to stimulate a healthy environment	There would be grazing in "Unit 1" (North, Middle, Double Crossing pastures) to utilize the forage available that is outside of the PF restoration plots and the BLM restoration areas (the creek and riparian wetland areas). This area would be grazed prescriptively on a free use permit. See Sections 2.1 and 2.7.1 for more details.
Water Development, Water Resources, Riparian and Wetland Areas		
Int-ISU-4	Poor fish habitat due to lack of overhanging riparian vegetation, lack of bank cover (from riparian vegetation) and poor channel form	Design features in the EA (Sections 2.0 and 2.1) would address these issues by providing recruitment and establishment opportunities for riparian stabilizers, increasing the number of riparian species, increasing bank cover, and improving channel form to regain access to floodplain. See Section 3.7.
Pub-ISU-25	Address Water Development to better utilize grasses away from current water resources	Range Improvement Projects will be analyzed as needed under separate NEPA processes. Some water developments are currently being addressed (NEPA# DOI-BLM-MT-C020-2020-0045)

Generated Internally (IDT) or Externally (Public)	Issues, Concerns, Suggested Alternatives or Terms and Conditions for Alternatives	BLM Response
Pub-ISU-26	Limit water development to no closer than 0.5 miles from mesic areas important to greater sage-grouse	Range Improvement Projects will be analyzed as needed under separate NEPA processes. Wildlife habitat will be taken into account when analyzing RIPs projects.
Pub-ISU-27	EA should address water resource management including pipelines and reservoir management	Another EA is addressing this issue (NEPA# DOI-BLM-MT-C020-2020-0045). Any other RIPs projects needed in the future will be addressed under another NEPA process.
Int-ISU-5 Pub-ISU-28	Riparian and shrub community management and health	See Sections 2.0 and 2.1. The developed grazing rotations in each Action Alternative would be designed to meet riparian objectives in other riparian areas not included in 2.0 and 2.1.
Int-ISU-6	Poor water quality. Pumpkin Creek listed on 303d list impaired for temperature and salinity	Design features in the EA (Sections 2.0 and 2.1) would address water quality issues by providing recruitment and establishment opportunities for riparian stabilizers, increasing the number of riparian species, increasing bank cover, and improving channel form to regain access to floodplain
Fire		
Pub-ISU-29	Grazing is needed in Unit 1 to reduce fire hazard	the BLM is currently developing an EA that would authorize Fuels treatments in the project area ("Unit 1" area) to mitigate fire risk. *High Density Recreational Use Locations: Hazardous Fuels and Fire Danger Reduction Project NEPA#: DOI-BLM-MT-C020-2020-XX*
Int-ISU-7 Pub-ISU-30	Develop admin access across pumpkin creek for habitat development, prescribed fire, and wildfire suppression	The BLM would establish a creek crossing across Pumpkin Creek for administrative access to the East side of Pumpkin Creek for wildfire suppression and any prescribed fire activities needed, as well as for restoration purposes. This crossing would also be utilized by temporary permit holders for accessing the forage

Generated Internally (IDT) or Externally (Public)	Issues, Concerns, Suggested Alternatives or Terms and Conditions for Alternatives	BLM Response
		available for grazing on the East side of Pumpkin Creek.
Other Issues		
Int-ISU-8	Concerns about Soil erosion from grazing	See Chapter 3 discussion, 3.8. Addressed in the EA through design features (Section 2.0 and 2.1) and developed grazing rotations
Pub-ISU-31	Neighboring Landowners should have priority for permit or to graze	The Pumpkin Creek allotment lies within the boundaries of one of the Grazing Districts set up under Section 3 of the Taylor Grazing Act. As such, there is not a requirement for an applicant's base property to adjoin the allotment when applying for a grazing permit on the allotment. BLM cannot arbitrarily limit applicants to having adjoining base property.
Pub-ISU-32	Analyze the status quo - allowing the current permittee to continue to graze the allotment.	The BLM is not under an obligation to maintain the status quo since 1) permits convey no right title or interest in public lands and 2) the assignment of grazing preference to the current permittee's private land was vacated with the Judge's order. Applicants who are preference holders have the first position to apply for a grazing permit. In this case, with the prior decision being vacated, there is no preference holder.
Pub-ISU-33	Analyze cost of reimbursement for contributions to range improvement projects by current permittee	If an alternative is selected that allows for a permittee(s), the BLM would not at the time of the EA know if the current permittee would be selected and therefore no need for reimbursement, or if another entity would be selected at which point compensation would be required. Compensation for loss of range improvements is required by law. Pursuant to 43 CFR 4120.3-6, the BLM would reasonably compensate the

Generated Internally (IDT) or Externally (Public)	Issues, Concerns, Suggested Alternatives or Terms and Conditions for Alternatives	BLM Response
		current permittee for the adjusted value of their interest in authorized permanent improvements placed or constructed by the permittee on the allotment. To analyze the cost of reimbursement would be pre-decisional and is not a factor in selection of an alternative (i.e., it is required by regulations). If the current permit holder is not selected the BLM would allot compensation pursuant to 43 CFR 4120.3-6 regardless of an analysis in this EA.
Pub-ISU-34	EA must explain how the BLM will ensure an applicant selected through a random drawing will meet mandatory qualifications and ensure proper use of rangelands	Though this EA does not analyze how an applicant would be selected, all applicants would be reviewed for meeting the mandatory qualifications set forth in 43 CFR 4110.1; other factors in 43 CFR 4110.3-1 and 4130.1-2 will be used at the discretion of the authorized officer to qualify applicants. Only qualified applicants will be submitted to the lottery drawing. The process of selecting a permittee is at the discretion of the authorized officer and will be disclosed in the Proposed Decision.
Pub-ISU-35	EA must explain how the BLM will ensure proper use of rangelands through a random drawing	When applying for the permit, the applicant is agreeing to comply with the grazing plan identified in the selected alternative, along with the terms and conditions identified in said alternative selected by the Field Manager. 43 CFR 4130.1-2 allows for the authorized officer to select between conflicting applications to authorize grazing based on ANY of the bulleted points (4130.1-2 (a -h)). The authorized officer will evaluate applications for meeting criteria and qualifications before submitting applications for the lottery drawing.

Generated Internally (IDT) or Externally (Public)	Issues, Concerns, Suggested Alternatives or Terms and Conditions for Alternatives	BLM Response
Pub-ISU-36	EA must consider other alternatives besides the preferred and explain why those were not selected	This EA is considering four Action Alternatives, in addition to the No Action Alternative (Section 2). Other Alternatives considered but not carried forward are in Section 2.7. The rationale used by the authorized officer for selecting an alternative will be disclosed in the Decision , not in the EA; and the decision rationale is based on evaluating how an alternative meets the purpose and need considering the impacts to the issues analyzed.
Pub-ISU-37	Original intent for the land during the land exchange	In developing alternatives in this EA, the BLM is following direction and objectives in the current MCFO ARMP.
Pub-ISU-38	Enough scoping and comments have been made, there was already a decision and permit issued	There was a previous EA and decision which involved the public through scoping and comment periods. However, this previous decision was challenged. The BLM and permittee settled with a vacatur and remand of the Decision back to the BLM to redo the NEPA analysis and issue a new decision. OHA approved the vacatur and remand, and BLM is now bound to the OHA order.
Pub-ISU-39	Current permittee victim of appeal process	Though this statement is outside the scope of this EA, the current permittee received the Notice of Final Decision which responded to protests of the Proposed Decision. The permittee was served copies of the appeals in accordance with Administrative Remedy regulations. The current permittee was aware of the Decision being challenged prior to the permit being issued since the permit was issued following the appeal period. In addition, permits convey no right title or interest in public lands.

Table 3. Species of fish found at four sampling reaches in Pumpkin Creek, listed alphabetically first by family name then by common name. Origin: N = native, E = exotic.

Family	Common Name	Origin	Status
Fish			
Catostomidae (Suckers)	Bigmouth Buffalo	N	
	Longnose Sucker	N	
	River Carpsucker	N	
	Shorthead Redhorse	N	
	White Sucker	N	
Centrarchidae (sunfish)	Green Sunfish	E	
	Smallmouth Bass	E	
	White Crappie	E	
Cyprinidae (Minnows)	Brassy Minnow	N	Potential Species of Concern
	Common Carp	E	Aquatic Invasive Species
	Creek Chub	N	Potential Species of Concern
	Emerald Shiner	N	
	Fathead Minnow	N	
	Flathead Chub	N	
	Lake Chub	N	
	Longnose Dace	N	
	Plains Minnow	N	Potential Species of Concern
	Sand Shiner	N	
	Western Silvery Minnow	N	
Cyprinodontidae (Killifish)	Plains Killifish	E	
Gadidea (Cod)	Burbot	N	
Hiodontidae (Mooneyes)	Goldeye	N	
Ictaluridae (Catfish)	Black Bullhead	E	
	Channel Catfish	N	
	Stonecat	N	
Percidae (Perch)	Sauger	N	BLM Sensitive State Species of Concern
	Yellow Perch	E	
Amphibian			
Ranidae (True Frogs)	Northern Leopard Frog	N	
Hylidae (Chorus Frogs)	Boreal Chorus Frog	N	
Scaphiopodidae (Spadefoots)	Plains Spadefoot	N	
Bufonidae (True Toads)	Great Plains Toad	N	BLM Sensitive State Species of Concern
	Woodhouse Toad	N	
Reptiles			

Family	Common Name	Origin	Status
Chelydridae (snapping turtles)	Snapping Turtle	N	BLM Sensitive State Species of Concern
Trionychidae (softshell)	Spiny Softshell	N	BLM Sensitive State Species of Concern
Emydidae (pond turtles)	Painted Turtle	N	

Table 4. NRCS mapped soils within the Pumpkin Creek Allotment

Map Unit Symbol	Map Unit Name	Acres	% of PCMA	Avg % slope	Farmland Classification	Fire Damage
19C	Archin loam, 2-8% slopes	132.8	0.60%	5	Not prime	Slight
192C	Archin-Davidell-Bullock complex, 2-8% slopes	16.1	0.10%	5	Not prime	Slight
191C	Archin-Gerdrum loams, 2-8% slopes	244.4	1.10%	5	Not prime	Slight
17F	Badland	4.1	0.00%		Not prime	Not rated
271E	Busby-Twilight-Blacksheep fine sandy loams, 8-35% slopes	16.9	0.10%	12	Not prime	Moderate
18E	Cabbart-Havre loams, 0-35% slopes	27.8	0.10%	19	Not prime	Moderate
386F	Cabbart-Rock outcrop-Delpoint complex, 15-50% slopes	1,516.90	7.10%	33	Not prime	Moderate
3F	Cabbart-Rock outcrop-Yawdim complex, warm, 15-70% slopes	2,201.30	10.30%	43	Not prime	High
297C	Cambeth, noncalcareous-Megonot complex, 2-8% slopes	353.4	1.70%	5	Not prime	Moderate
297D	Cambeth, noncalcareous-Megonot complex, 8-15% slopes	3,105.50	14.60%	12	Not prime	Moderate
296F	Cambeth-Cabbart-Rock outcrop complex, 8-45% slopes	431.2	2.00%	12	Not prime	Moderate
297E	Cambeth-Cabbart-Yawdim complex, 15-25% slopes	3,169.90	14.90%	20	Not prime	Moderate
353C	Chinook-Kremlin complex, 2-6% slopes	39.9	0.20%	4	Farmland of statewide importance	Moderate
811C	Creed-Pinehill loams, 2-8% slopes	52.6	0.20%	5	Not prime	Slight
383F	Delpoint-Cabbart-Yawdim complex, 25-70% slopes	1,485.90	7.00%	35	Not prime	Moderate
385E	Delpoint-Yamacall-Cabbart loams, 8-25% slopes	1,401.80	6.60%	20	Not prime	Moderate
41C	Eapa loam, 2-8% slopes	2.5	0.00%	4	Prime if irrigated	Slight
421D	Gerdrum-Creed complex, 4-15% slopes, gullied	75.7	0.40%	10	Not prime	Slight
451A	Glendive fine sandy loam, 0-2% slopes, occasionally flooded	51.7	0.20%	1	Prime if irrigated and the product of I x C does not exceed 60	Moderate

Map Unit Symbol	Map Unit Name	Acres	% of PCMA	Avg % slope	Farmland Classification	Fire Damage
452A	Glendive loam, 0-2% slopes, rarely flooded	63	0.30%	1	Prime if irrigated	Slight
486A	Glendive-Havre complex, 0-2% slopes, nonflooded	79.4	0.40%	1	Farmland of statewide importance	Moderate
453A	Glendive-Havre complex, 0-2% slopes, occasionally flooded	47.3	0.20%	1	Prime if irrigated and the product of I x C does not exceed 60	Moderate
46A	Hanly loamy fine sand, 0-2% slopes, rarely flooded	57.2	0.30%	1	Not prime	High
462A	Hanly-Glendive complex, 0-2% slopes, nonflooded	123.4	0.60%	1	Not prime	High
471A	Harlake silty clay, 0-2% slopes, occasionally flooded	251.1	1.20%	1	Farmland of statewide importance	Moderate
47A	Harlake silty clay, 0-2% slopes, rarely flooded	20	0.10%	1	Farmland of statewide importance	Moderate
481A	Havre loam, 0-2% slopes, occasionally flooded	123.6	0.60%	1	Prime if irrigated	Slight
4881A	Havre loam, 0-2% slopes, rarely flooded	29.9	0.10%	1	Prime if irrigated	Slight
488A	Havre silty clay loam, 0-2% slopes, occasionally flooded	0.1	0.00%	1	Prime if irrigated	Slight
53A	Kobase silty clay loam, 0-2% slopes	37.4	0.20%	1	Farmland of statewide importance	Slight
531D	Kobase silty clay loam, 2-15% slopes, gullied	212.8	1.00%	9	Not prime	Slight
53D	Kobase silty clay loam, 8-15% slopes	30.3	0.10%	12	Not prime	Moderate
53C	Kobase silty clay loam, warm, 2-8% slopes	149.4	0.70%	5	Farmland of statewide importance	Slight
532C	Kobase-Gerdrum silty clay loams, 2-8% slopes	313	1.50%	5	Not prime	Slight
473A	Lallie silty clay, 0-2% slopes	17.6	0.10%	1	Not prime	Moderate
576C	Lonna silty clay loam, 2-8% slopes	16.4	0.10%	5	Not prime	Moderate
573D	Lonna, Cambeth, and Yamacall soils, gullied, 8-15% slopes	150.6	0.70%	12	Not prime	Moderate

Map Unit Symbol	Map Unit Name	Acres	% of PCMA	Avg % slope	Farmland Classification	Fire Damage
575C	Lonna-Cambeth silt loams, 2-8% slopes	47	0.20%	4	Not prime	Moderate
574E	Lonna-Cambeth-Cabbart silt loams, 12-25% slopes	80.2	0.40%	14	Not prime	Moderate
577D	Lonna-Cambeth-Cabbart silt loams, 4-12% slopes	60.3	0.30%	8	Not prime	Moderate
62C	Marvan silty clay, warm, 2-8% slopes	90	0.40%	4	Not prime	Moderate
621B	Marvan-Vanda silty clays, 0-4% slopes	338.8	1.60%	2	Not prime	Moderate
742E	Neldore-Abor silty clays, 4-25% slopes	115.6	0.50%	20	Not prime	Moderate
64C	Pinehill loam, 2-8% slopes	452.8	2.10%	5	Farmland of statewide importance	Slight
641D	Pinehill-Absher complex, 2-15% slopes	7.3	0.00%	9	Not prime	Slight
90C	Sonnett loam, 2-8% slopes	176.7	0.80%	5	Not prime	Slight
902C	Sonnett, thin surface-Slickspots complex, 0-8% slopes	541.2	2.50%	4	Not prime	Slight
901A	Sonnett-Sonnett, thin surface, complex, 0-2% slopes	270.5	1.30%	5	Not prime	Slight
901C	Sonnett-Sonnett, thin surface, complex, 2-8% slopes	1,566.30	7.40%	1	Farmland of statewide importance	Slight
489A	Spinekop silty clay loam, 0-2% slopes	53	0.20%	1	Prime if irrigated	Slight
122D	Tinsley-Chanta complex, 4-15% slopes	8	0.00%	10	Not prime	High
79C	Yamacall loam, warm, 2-8% slopes	258.7	1.20%	5	Farmland of statewide importance	Slight
797E	Yamacall-Busby-Blacksheep complex, 8-25% slopes	4.9	0.00%	10	Not prime	Moderate
798C	Yamacall-Delpoint loams, warm, 2-8% slopes	12.5	0.10%	5	Not prime	Slight
892D	Yamacall-Delpoint-Cabbart loams, 4-15% slopes	1.8	0.00%	10	Not prime	Slight
30C	Yamacall-Havre, occasionally flooded, loams, 0-8% slopes	1,160.60	5.40%	5	Farmland of statewide importance	Slight

12 Appendix G: Grazing

12.0 Alternative 2 – One Grazing Authorization

The pasture use dates would be determined by each pasture's carrying capacity but adjusted to the grazing season of use (May 1 to October 10). Using 378 Animal Units, following is the maximum number of days of grazing each pasture would provide:

Pasture	#of days
Dry Creek Pasture	23
Dry Divide Pasture	40
Pine Hill Pasture	42
Jack Divide Pasture	32
Upper Prat Pasture	18
Two Wells Pasture	14
Old Corral, et al Pasture	12
Well/West Ridge Pasture	11
Artesian Pasture	9

Resting pastures of differing capacities each year necessitates the adjustment of grazing days in each pasture to remain within the May 1 to October 10 permit dates. The table below shows the adjusted days of grazing for each pasture by year.

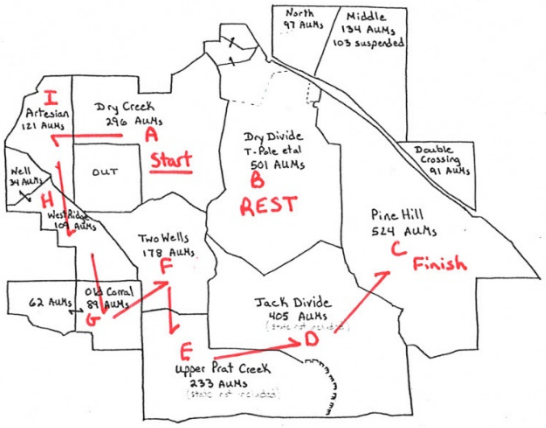
Year	Dry Creek (23)	Dry Divide (40)	Pine Hill (42)	Jack Divide (32)	Upper Prat (18)	Two Wells (14)	Old Corral et al (12)	Well/West Ridge (11)	Artesian (9)	Total days (161)	AUMs Used
1	24	0	42	32	19	14	12	11	9	163	2026
2	0	36	40	29	16	13	11	10	8	163	2025
3	19	34	35	27	15	12	10	9	0	161	2001
4	19	34	37	27	16	12	10	0	8	163	2026
5	20	35	37	27	15	12	0	9	8	163	2026
6	20	34	38	29	15	0	10	9	8	163	2025
7	20	36	38	28	0	12	11	10	8	163	2025
8	23	39	41	0	17	13	11	10	9	163	2027
9	24	41	0	32	19	14	12	11	10	163	2026

Treatments
A – Early (used 1st in rotation)
B – REST
C – Defer the latest (used last or 8th in rotation)
D – used 7th in rotation
E – used 6th in rotation
F – used 5th in rotation
G – used 4th in rotation
H – used 3rd in rotation
I - used 2nd in rotation

Year	Dry Creek	Dry Divide	Pine Hill	Jack Divide	Upper Prat	Two Wells	Old Corral et al	West Ridge/Well	Artesian
1	A 5/1 to 5/23	B (Rest)	C 8/28 to 10/10	D 7/27 to 8/27	E 7/9 to 7/26	F 6/25 to 7/8	G 6/13 to 6/24	H 6/2 to 6/12	I 5/24 to 6/1
2	B (Rest)	C 9/5 to 10/10	D 7/27 to 9/4	E 6/28 to 7/26	F 6/12 to 6/27	G 5/30 to 6/11	H 5/19 to 5/29	I 5/9 to 5/18	A 5/1 to 5/8
3	C 9/22 to 10/10	D 8/18 to 9/21	E 7/13 to 8/17	F 6/16 to 7/12	G 6/1 to 6/15	H 5/20 to 5/31	I 5/10 to 5/19	A 5/1 to 5/9	B (Rest)
4	D 9/14 to 10/2	E 8/11 to 9/13	F 7/5 to 8/10	G 6/8 to 7/4	H 5/23 to 6/7	I 5/11 to 5/22	A 5/1 to 5/10	B (Rest)	C 10/3 to 10/10
5	E 9/4 to 9/23	F 7/31 to 9/3	G 6/24 to 7/30	H 5/28 to 6/23	I 5/13 to 5/27	A 5/1 to 5/12	B (Rest)	C 10/2 to 10/10	D 9/24 to 10/1
6	F 8/25 to 9/13	G 7/22 to 8/24	H 6/14 to 7/21	I 5/16 to 6/13	A 5/1 to 5/15	B (Rest)	C 10/1 to 10/10	D 9/22 to 9/30	E 9/14 to 9/21
7	G 8/11 to 8/30	H 7/6 to 8/10	I 5/29 to 7/5	A 5/1 to 5/28	B (Rest)	C 9/29 to 10/10	D 9/18 to 9/28	E 9/8 to 9/17	F 8/31 to 9/7
8	H 7/20 to 8/11	I 6/11 to 7/19	A 5/1 to 6/10	B (Rest)	C 9/24 to 10/10	D 9/11 to 9/23	E 8/31 to 9/10	F 8/21 to 8/30	G 8/12 to 8/20
9	I 6/11 to 7/4	A 5/1 to 6/10	B (Rest)	C 9/9 to 10/10	D 8/21 to 9/8	E 8/7 to 8/20	F 7/26 to 8/6	G 7/15 to 7/25	H 7/5 to 7/14

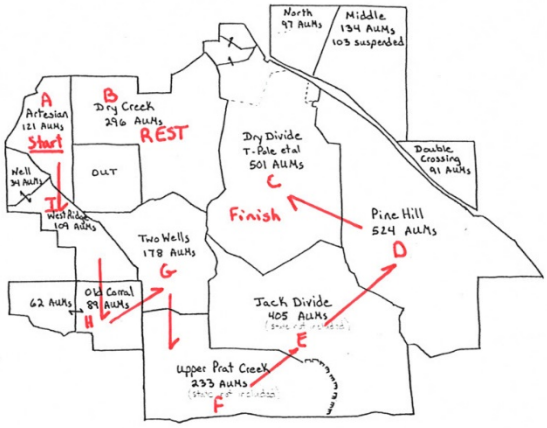
Alt 2 - One Authorization

Pumpkin Creek
Allotment # 10509



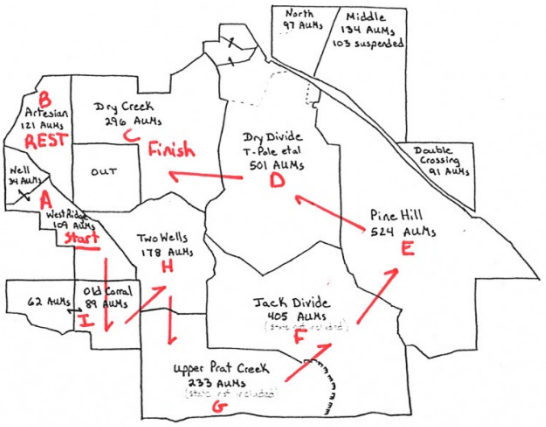
Year 1

Pumpkin Creek
Allotment # 10509



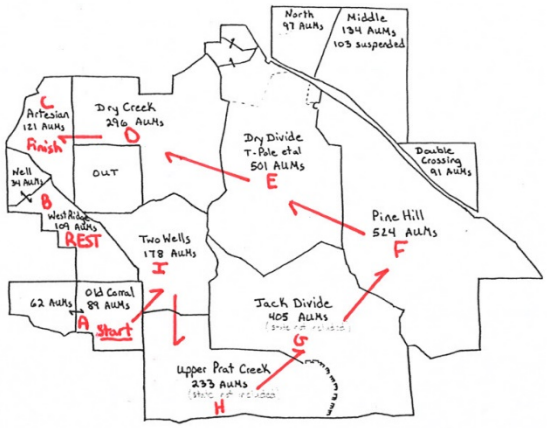
Year 2

Pumpkin Creek
Allotment # 10509



Year 3

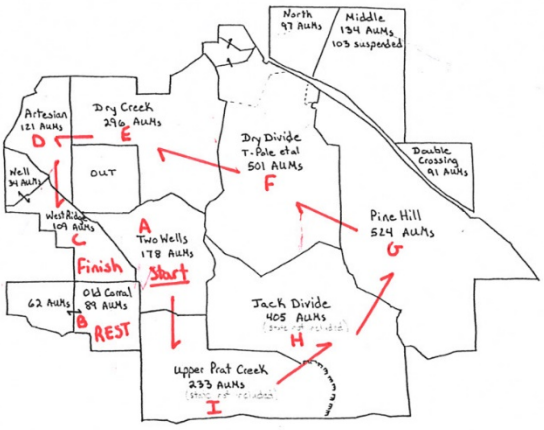
Pumpkin Creek
Allotment # 10509



Year 4

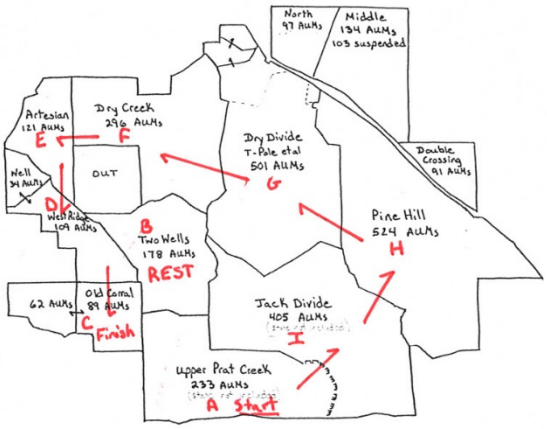
Alt 2 - One Authorization

Pumpkin Creek
Allotment # 10509



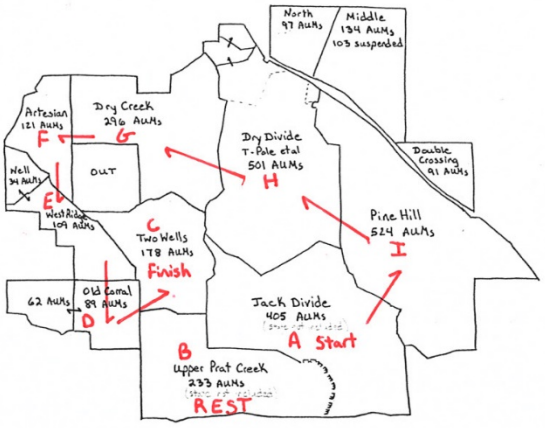
Year 5

Pumpkin Creek
Allotment # 10509



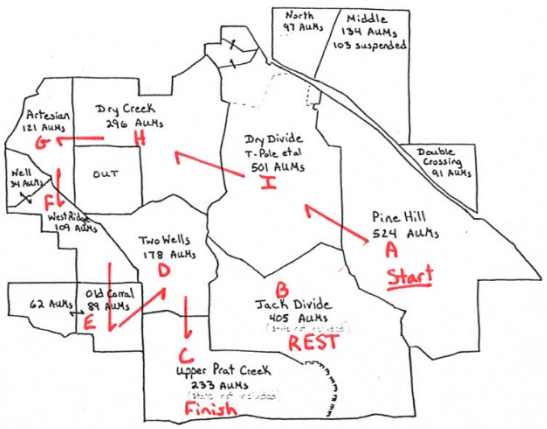
Year 6

Pumpkin Creek
Allotment # 10509



Year 7

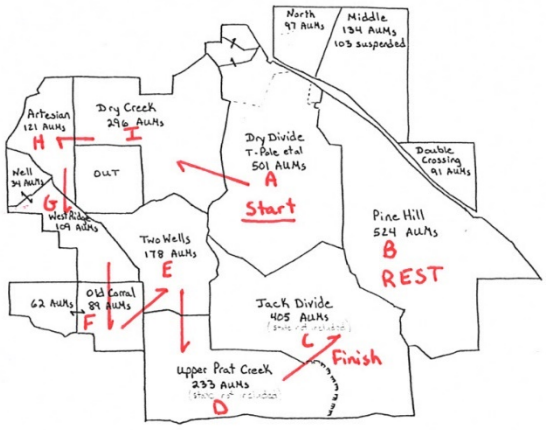
Pumpkin Creek
Allotment # 10509



Year 8

Alt 2 - One Authorization

Pumpkin Creek
Allotment # 10509



Year 9

12.1 Alternative 3 – Two Grazing Authorizations

12.1.1 *First Authorization – 4 Pasture Rest Rotation*

The first Authorization involves the Dry Creek Pasture, Dry Divide Pasture, Pine Hill Pasture and Jack Divide Pasture. The pasture use dates would be determined by each pasture's carrying capacity but adjusted to the grazing permit dates (May 15 to October 1). Using 261 Animal Units, following is the maximum number of days of grazing each pasture would provide:

Pasture	#of days
Dry Creek Pasture	34
Dry Divide Pasture	58
Pine Hill Pasture	61
Jack Divide Pasture	47

Resting pastures of differing capacities each year necessitates the adjustment of grazing days in each pasture to remain within the May 15 to October 1 permit dates. The table below shows the adjusted days of grazing for each pasture by year.

Year	Dry Creek (34)	Dry Divide (58)	Pine Hill (61)	Jack Divide (47)	Total days (140)	AUMs used
1	34	0	59	47	140	1201
2	0	50	51	39	140	1202
3	32	53	55	0	140	1202
4	34	58	0	48	140	1202

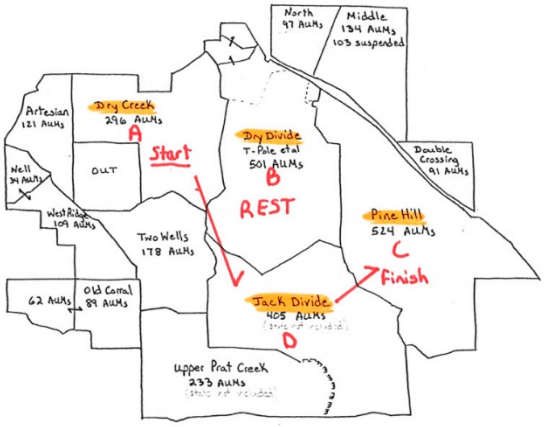
Treatments
A – Early (used 1st in rotation)
B – REST
C – Defer the latest (used last or 3rd in rotation)
D – Mid (used 2nd in rotation)

Year	Dry Creek	Dry Divide	Pine Hill	Jack Divide
1	A 5/15 to 6/17	B (Rest)	C 8/4 to 10/1	D 6/18 to 8/3
2	B (Rest)	C 8/13 to 10/1	D 6/23 to 8/12	A 5/15 to 6/22
3	C 8/31 to 10/1	D 7/9 to 8/30	A 5/15 to 7/8	B (Rest)
4	D 7/12 to 8/14	A 5/15 to 7/11	B (Rest)	C 8/15 10/1

Alt 3 - Two Authorizations

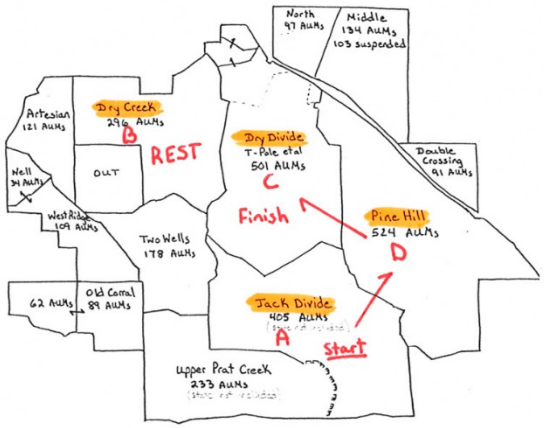
1st Authorization - 4 Pasture Rest Rotation

Pumpkin Creek
Allotment # 10509



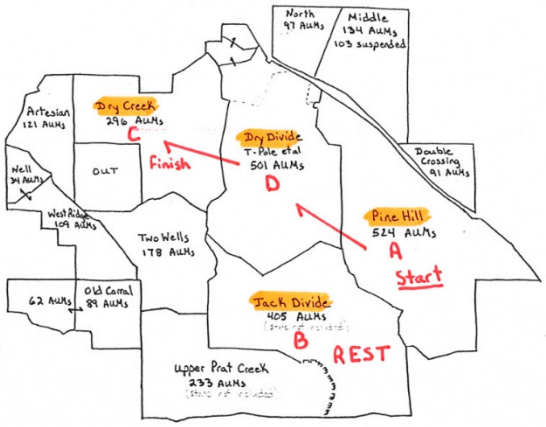
Year 1

Pumpkin Creek
Allotment # 10509



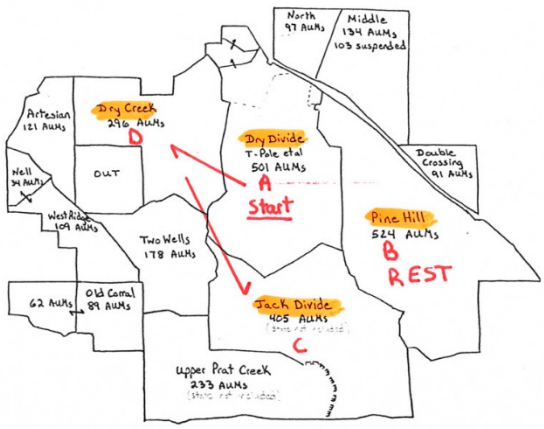
Year 2

Pumpkin Creek
Allotment # 10509



Year 3

Pumpkin Creek
Allotment # 10509



Year 4

12.1.2 *Second Authorization – 5 Pasture Rest Rotation*

The second Authorization involves the Upper Prat Pasture, Two Wells Pasture, Old Corral, et al. Pasture, Well/West Ridge Pasture, and the Artesian Pasture. The pasture use dates would be determined by each pasture's carrying capacity but adjusted to the grazing permit dates (May 15 to October 1). Using 128 Animal Units, following is the maximum number of days of grazing each pasture would provide:

Pasture	#of days
Upper Prat Pasture	55
Two Wells Pasture	42
Old Corral, et al Pasture	36
Well/West Ridge Pasture	34
Artesian Pasture	28

Resting pastures of differing capacities each year necessitates the adjustment of grazing days in each pasture to remain within the May 15 to October 1 permit dates. The table below shows the adjusted days of grazing for each pasture by year.

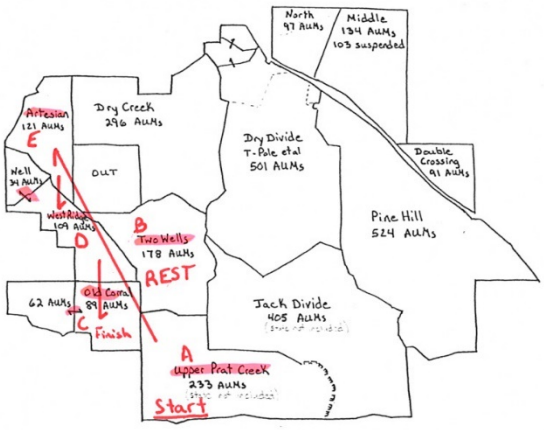
Year	Upper Prat (55)	Two Wells (42)	Old Corral et a (36)	Well/West Ridge (34)	Artesian (28)	Total days 140	AUMs Used
1	50	0	34	31	25	140	588
2	0	42	36	34	28	140	589
3	47	35	30	28	0	140	589
4	448	37	31	0	24	140	589
5	48	37	0	31	24	140	589

Treatments
A – Early (used 1st in rotation)
B – REST
C – Defer the latest (used last or 4th in rotation)
D – used 3rd in rotation
E – used 2nd in rotation

Year	Upper Prat	Two Wells	Old Corral et al	West Ridge/Well	Artesian
1	A 5/15 to 7/3	B (Rest)	C 8/29 to 10/1	D 7/29 to 8/28	E 7/4 to 7/28
2	B (Rest)	C 8/21 to 10/1	D 7/16 to 8/20	E 6/12 to 7/15	A 5/15 to 6/11
3	C 8/16 to 10/1	D 7/12 to 8/15	E 6/12 to 7/11	A 5/15 to 6/11	B (Rest)
4	D 7/22 to 9/6	E 6/15 to 7/21	A 5/15 to 6/14	B (Rest)	C 9/7 to 10/1
5	E 6/21 to 8/7	A 5/15 to 6/20	B (Rest)	C 9/1 to 10/1	D 8/8 to 8/31

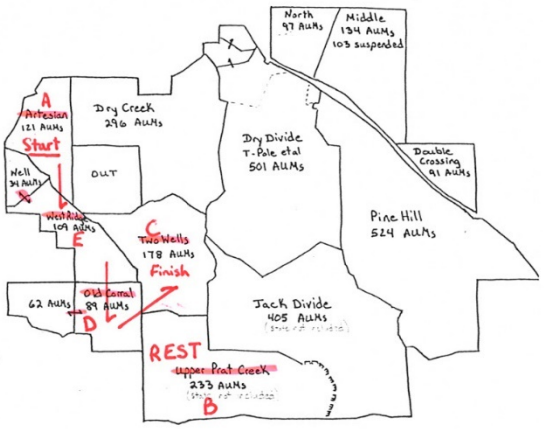
Alt 3 - Two Authorizations
2nd Authorization - 5 Pasture Rest - Rotation

Pumpkin Creek
Allotment # 10509



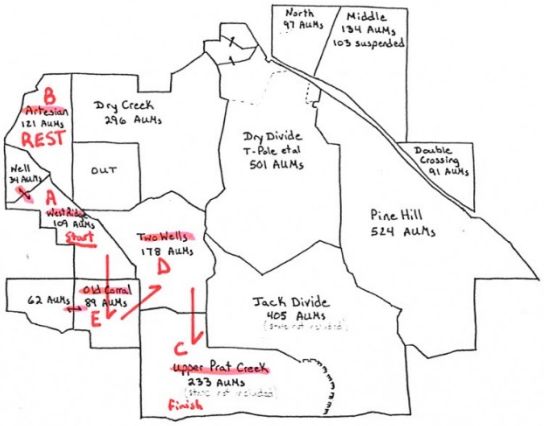
Year 1

Pumpkin Creek
Allotment # 10509



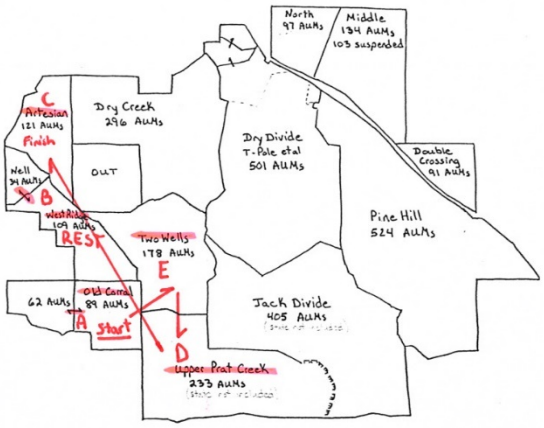
Year 2

Pumpkin Creek
Allotment # 10509



Year 3

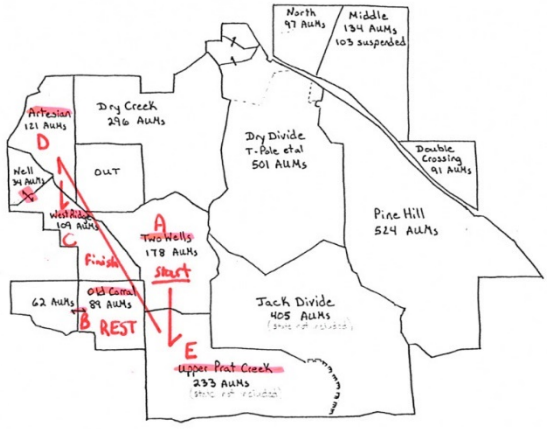
Pumpkin Creek
Allotment # 10509



Year 4

Alt 3 - Two Authorizations
2nd Authorization - 5 Pasture Rest Rotation

Pumpkin Creek
Allotment # 10509



Year 5

12.2 Alternative 4 – Reserve Common Allotment (RCA)

The total available forage in this alternative is 2,552 AUMs. Approximately one half of the RCA would be grazed annually either in a 3-pasture deferred rotation (1,430 AUMs available in the Dry Divide, Pine Hill and Jack Divide pastures) or in a 6-pasture deferred rotation (1,122 AUMs available in the Dry Creek, Artesian, Well/West Ridge, Old Corral et al, Two Wells and Upper Prat Creek pastures). The portion being grazed would be alternated annually. The remaining half of the RCA pastures would be rested. In the event of an emergency (e.g. wildfire), the rested portion of the RCA would be available for grazing to permittees affected by the emergency, dependent on resource needs being achieved. Resource needs would dictate how often these rest pastures would be available. Use dates would be limited to be between May 1 to October 1.

On alternate years, a herd size of up to 282 animal units (A.U.) would be grazed in a deferred rotation grazing system with 3 pastures and 3 treatments. Following is the number of days of grazing that would be available in each pasture using 282 A. U.

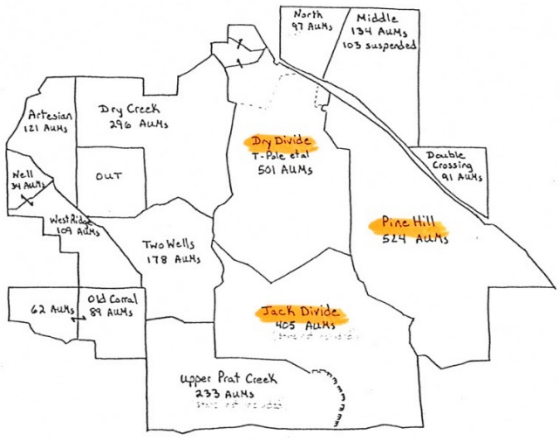
Pasture	#of days
Dry Divide Pasture	54
Pine Hill Pasture	56
Jack Divide Pasture	44
	154

Treatments
A Early
B Late
C Middle

Year	Dry Divide et al	Pine Hill	Jack Divide
1	A 5/1 to 6/23	B 8/7 to 10/1	C 6/24 to 8/6
2	B 8/9 to 10/1	C 6/14 to 8/8	A 5/1 to 6/13
3	C 6/26 to 8/18	A 5/1 to 6/25	B 8/19 to 10/1

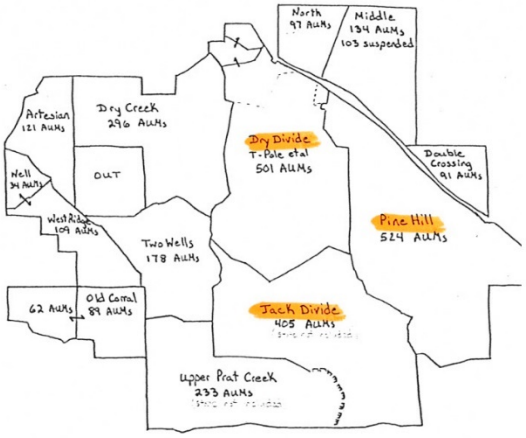
Alt 4 RCA Alternate between 3 Pasture Deferred and 6 Pasture Deferred (also Emergency Fire availability)

Pumpkin Creek
Allotment # 10509



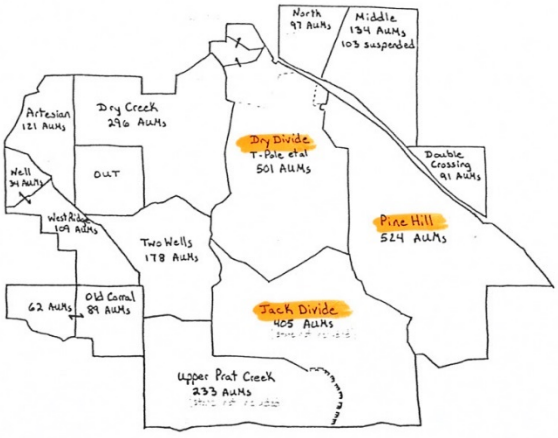
Year 1 of 3 pasture deferred

Pumpkin Creek
Allotment # 10509



Year 2 of 3 pasture deferred

Pumpkin Creek
Allotment # 10509



Year 3 of 3 pasture deferred

On alternate years, a herd size of up to 221 animal units (A.U.) would be grazed in a deferred rotation grazing system with 6 pastures and 6 treatments. Following is the number of days of grazing that would be available in each pasture using 221 A. U.

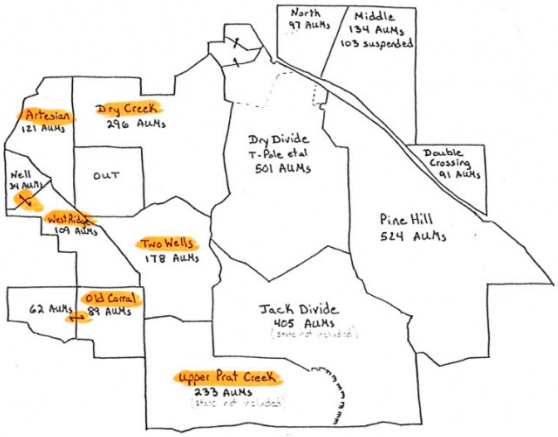
Pasture	#of days
Upper Prat Pasture	32
Two Wells Pasture	24
Old Corral, et al Pasture	20
Well/West Ridge Pasture	20
Artesian Pasture	17
Dry Creek Pasture	41
	154

Treatments
A - Early
B - Defer – used 6th in rotation
C - use 5th in rotation
D – use 4th in rotation
E – use 3rd in rotation
F- use 2nd in rotation

Year	Upper Prat	Two Wells	Old Corral et al	Well/West Ridge	Artesian	Dry Creek
1	A 5/1 to 6/1	B 9/8 to 10/1	C 8/19 to 9/7	D 7/30 to 8/18	E 7/13 to 7/29	F 6/2 to 7/12
2	B 8/31 to 10/1	C 8/7 to 8/30	D 7/18 to 8/6	E 6/28 to 7/17	F 6/11 to 6/27	A 5/1 to 6/10
3	C 7/21 to 8/21	D 6/27 to 7/20	E 6/7 to 6/26	F 5/18 to 6/6	A 5/1 to 5/17	B 8/22 to 10/1
4	D 7/4 to 8/4	E 6/10 to 7/3	F 5/21 to 6/9	A 5/1 to 5/20	B 9/15 to 10/1	C 8/5 to 9/14
5	E 6/14 to 7/15	F 5/21 to 6/13	A 5/1 to 5/20	B 9/12 to 10/1	C 8/26 to 9/11	D 7/16 to 8/25
6	F 5/25 to 6/25	A 5/1 to 5/24	B 9/12 to 10/1	C 8/23 to 9/11	D 8/6 to 8/22	E 6/26 to 8/5

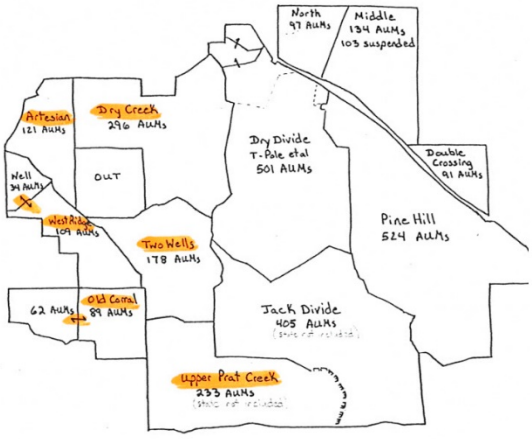
Alt 4 RCA Alternate between
3 Pasture Deferred and 6 Pasture Deferred
(also Emergency Fire availability)

Pumpkin Creek
Allotment # 10509



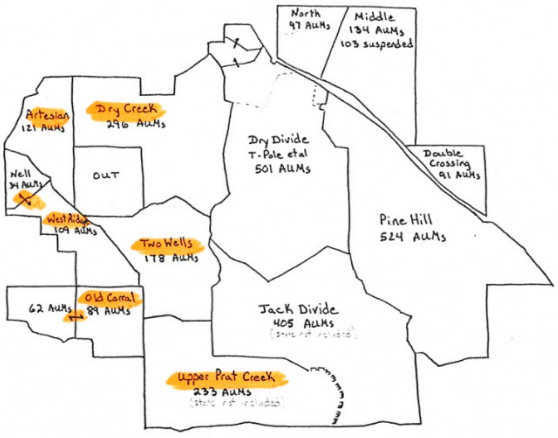
Year 1 of 6 pasture deferred

Pumpkin Creek
Allotment # 10509



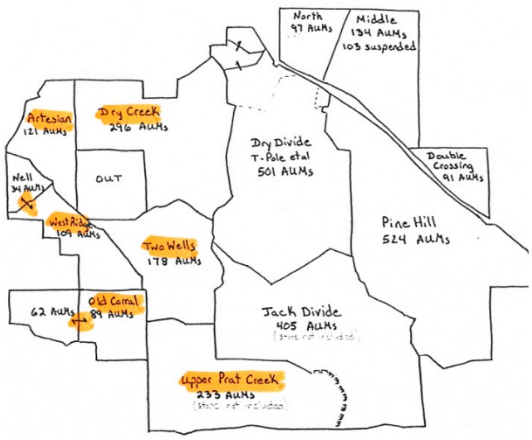
Year 2 of 6 pasture deferred

Pumpkin Creek
Allotment # 10509



Year 3 of 6 pasture deferred

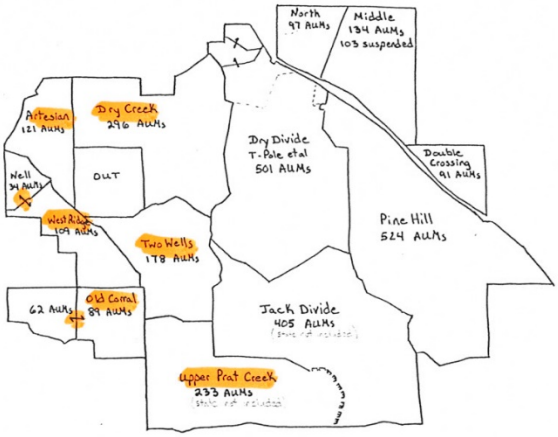
Pumpkin Creek
Allotment # 10509



Year 4 of 6 pasture deferred

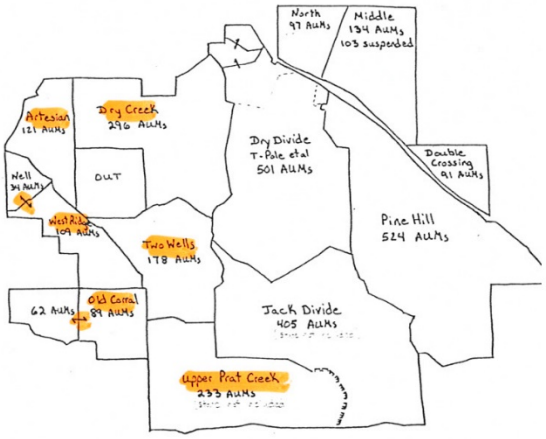
Alt 4 RCA Alternate between
3 Pasture Deferred and 6 Pasture Deferred
(also Emergency Fire Availability)

Pumpkin Creek
Allotment # 10509



Year 5 of 6 pasture deferred

Pumpkin Creek
Allotment # 10509



Year 6 of 6 pasture deferred

12.3 Alternative 5 – 3 Pasture RCA and 6 Pasture Grazing Authorization

12.3.1 *RCA – 3 Pasture Rest Rotation*

The 3 pasture RCA involves the Dry Divide Pasture, Pine Pasture, and Jack Divide Pasture. The pasture use dates would be determined by each pasture's carrying capacity but adjusted to the grazing permit dates (May 15 to October 1). Using 196 Animal Units, following is the number of days of grazing each pasture would provide:

Pasture	#of days
Dry Divide Pasture	77
Pine Hill Pasture	81
Jack Divide Pasture	62

Resting pastures of differing capacities each year necessitates the adjustment of grazing days in each pasture to remain within the May 15 to October 1 permit dates. The table below shows the adjusted days of grazing for each pasture by year.

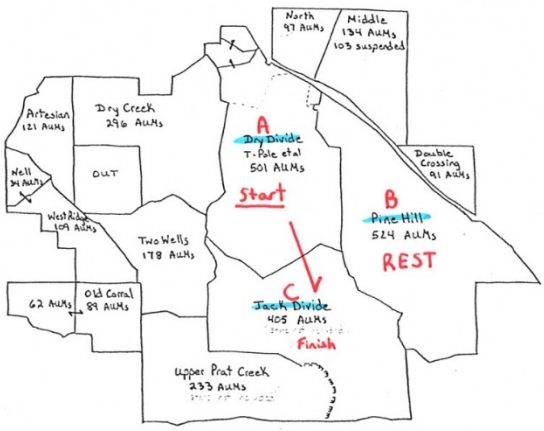
Year	Dry Divide (77)	Pine Hill (81)	Jack Divide (62)	Total days (139)	AUMs used
1	77	0	63	140	902
2	0	80	60	140	903
3	69	71	0	140	903

Treatments
A – Early (used 1st in rotation)
B – REST
C– Late (used 2nd in rotation - last)

Year	Dry Divide et al	Pine Hill	Jack Divide
1	A 5/15 to 7/30	B (Rest)	C 7/31 to 10/1
2	B (Rest)	C 7/14 to 10/1	A 5/15 to 7/13
3	C 7/25 to 10/1	A 5/15 to 7/24	B (Rest)

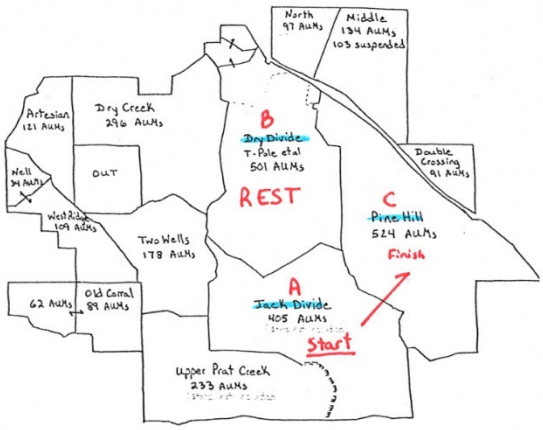
Alt 5 - RCA 3 Pasture Rest Rotation

Pumpkin Creek
Allotment # 10509



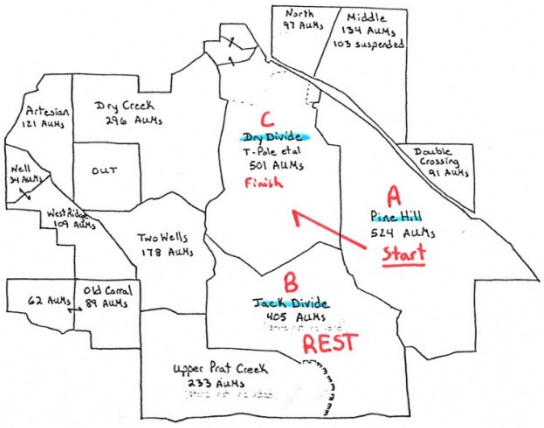
Year 1

Pumpkin Creek
Allotment # 10509



Year 2

Pumpkin Creek
Allotment # 10509



Year 3

12.3.2 *One Grazing Authorization – 6 Pasture Rest Rotation*

The grazing authorization involves the Dry Creek Pasture, Artesian Pasture, Well/West Ridge Pasture, Old Corral et al Pasture, Two Wells Pasture, and the Upper Prat Pasture. The pasture use dates would be determined by each pasture's carrying capacity but adjusted to the grazing permit dates (May 15 to October 1). Using 179 Animal Units, following is the maximum number of days of grazing each pasture would provide:

Pasture	#of days
Upper Prat Pasture	39
Two Wells Pasture	30
Old Corral, et al Pasture	25
Well/West Ridge Pasture	24
Artesian Pasture	20
Dry Creek Pasture	50

Resting pastures of differing capacities each year necessitates the adjustment of grazing days in each pasture to remain within the May 15 to October 1 permit dates. The table below shows the adjusted days of grazing for each pasture by year.

Year	Upper Prat (39)	Two Wells (30)	Old Corral e (25)	Well/West I (24)	Artesian (20)	Dry Creek (50)	Total days (140)	AUMs Used
1	35	0	22	21	18	44	140	824
2	0	29	23	22	19	47	140	824
3	41	30	25	24	20	0	140	824
4	32	25	21	20	0	42	140	824
5	33	26	21	0	18	42	140	824
6	33	26	0	21	17	43	140	824

Treatments

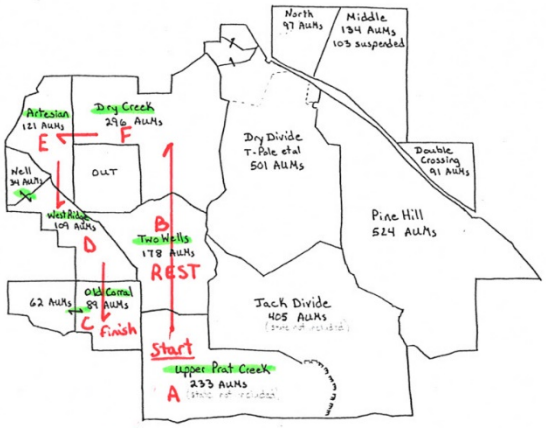
A – Early (used 1st in rotation)
B – REST
C – Defer the latest (used last or 5th in rotation)
D – used 4th in rotation
E – used 3rd in rotation
F – used 2nd in rotation

Year	Upper Prat	Two Wells	Old Corral et al	West Ridge/Well	Artesian	Dry Creek
1	A 5/15 to 6/18	B (Rest)	C 9/10 to 10/1	D 8/20 to 9/9	E 8/2 to 8/19	F 6/19 to 8/1
2	B (Rest)	C 9/3 to 10/1	D 8/11 to 9/2	E 7/20 to 8/10	F 7/1 to 7/19	A 5/15 to 6/30
3	C 8/22 to 10/1	D 7/23 to 8/21	E 6/28 to 7/22	F 6/4 to 6/27	A 5/15 to 6/3	B (Rest)
4	D 7/20 to 8/20	E 6/25 to 7/19	F 6/4 to 6/24	A 5/15 to 6/3	B (Rest)	C 8/21 to 10/1
5	E	F	A	B (Rest)	C	D

	7/1 to 8/2	6/5 to 6/30	5/15 to 6/4		9/14 to10/1	8/3 to 9/13
6	F 6/10 to 7/12	A 5/15 to 6/9	B (Rest)	C 9/11 to 10/1	D 8/25 to 9/10	E 7/13 to 8/24

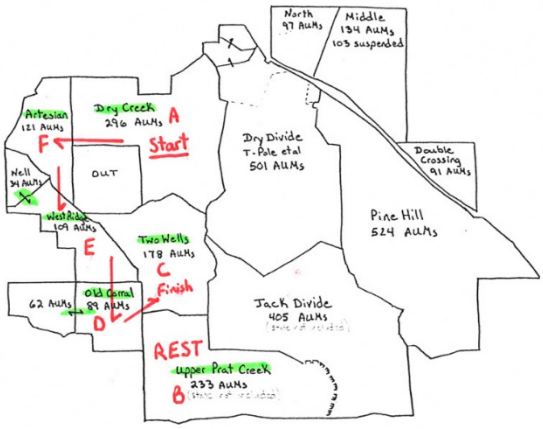
Alt 5 - Grazing Authorization - 6 Pasture Rest-Rotatio

Pumpkin Creek
Allotment # 10509



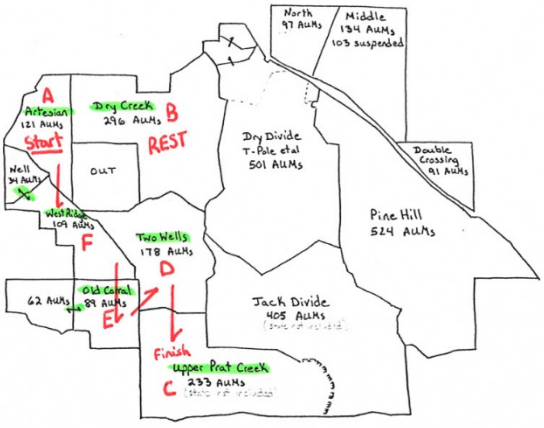
Year 1

Pumpkin Creek
Allotment # 10509



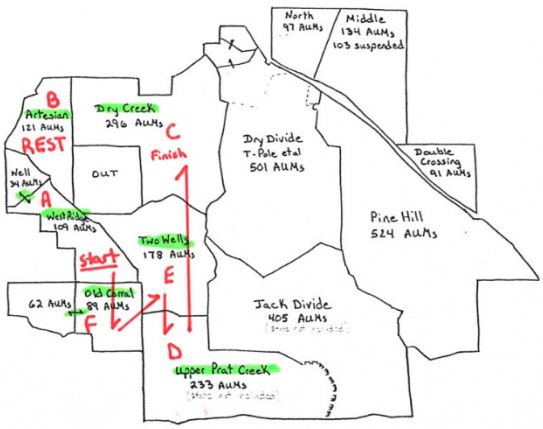
Year 2

Pumpkin Creek
Allotment # 10509



Year 3

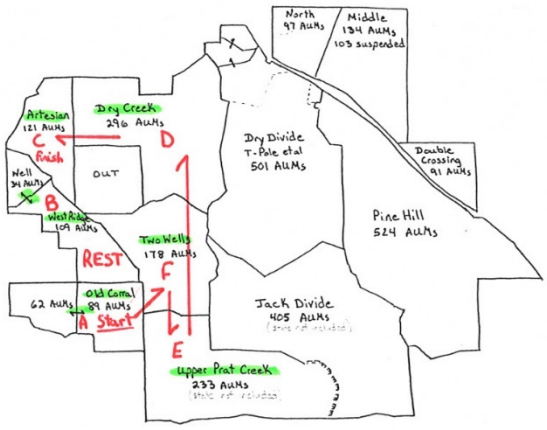
Pumpkin Creek
Allotment # 10509



Year 4

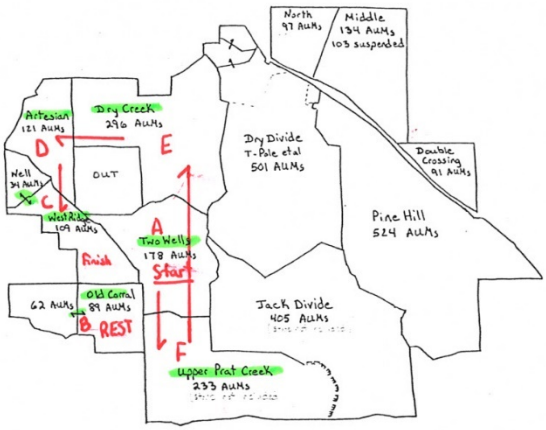
Alt 5 · Grazing Authorization 6 Pasture Rest Rotation

Pumpkin Creek
Allotment # 10509



Year 5

Pumpkin Creek
Allotment # 10509



Year 6

13 Appendix H – RCA Authorization Process

This Appendix defines a set of criteria that would be used for evaluating each applicant and deciding which applicant would be selected to graze the Pumpkin Creek Allotment should an Alternative be selected that designates the Pumpkin Creek Allotment as a Reserve Common Allotment or portions of the Pumpkin Creek Allotment as a Reserve Common Allotment.

43 CFR 4110.3-1 states when monitoring or documented field observations show that additional forage is available for livestock grazing, either on a temporary or sustained yield basis, BLM may apportion additional forage to qualified applications for livestock grazing use consistent with multiple-use management objectives specified in the applicable land use plan. When the authorized officer determines that additional forage is temporarily available for livestock grazing, he may authorize its use on a nonrenewable basis under 4130.6-2.

As a first step, BLM would review the applications submitted and initially rank them according to the criteria listed below.

Category 1 (1st Priority) – Vegetation Treatments. Current BLM grazing permittees and lessees whose "normally permitted" allotments are under an approved restoration or recovery project.

Category 2 (2nd Priority) – Emergency situations. Current BLM grazing permittees and lessees whose "normally permitted" allotments are temporarily unavailable because of emergency conditions such as wildfire.

As a condition of approval, the permittee would be required to take nonuse on their normally permitted grazing allotment.

Category 3 (3rd Priority) – Other Applicants. Any other applicant, either BLM grazing permittees under a Nonrenewable grazing permit (4130.6-2) to meet multiple use objectives or non-permittees under a Free-use grazing permit (4130.5) to manage vegetation to meet resource objectives other than the production of livestock forage.

If BLM receives more than one application (conflicting applications) within any of the above categories, the competing applications may be evaluated based on any of the criteria outlined in 43 CFR 4130.1-2, or based on the benefit to the resource, and may consider factors such as:

1) Amount of public land benefited
2) The prioritization of projects benefiting special status species, and
3) History of grazing permit compliance.

In addition, the applicant must provide evidence that they own or control all the livestock that would be authorized to graze public land. Livestock owned by the sons and daughters of the applicant may be included provided the following conditions are met:

1) The livestock owned by the sons and daughters to be grazed on public lands do not comprise greater than 50 percent of the total number authorized.

2) The brands or other markings of livestock that are owned by sons and daughters are recorded on the grazing application.

If the applicant does not own all the livestock, the applicant must provide BLM with the agreement that gives them control of the livestock. The agreement would describe the livestock and livestock numbers, identify the owner of the livestock, contain the terms for the care and management of the livestock, specify the duration of the agreement, list the brand and other identifying marks and would be signed by the livestock owner and the applicant. For this situation, a surcharge would be added to the grazing fee and would be paid prior to the authorized grazing use.

Applicants must also comply with the requirements of the State of Montana for branding of livestock, breed, grade, and number of bulls, health and sanitation. The BLM may require counting and/or additional special marking or tagging of the applicant's livestock in order to promote the orderly administration of the public lands.

An interdisciplinary team would determine which applicants are eligible, rank the applicants by placing them in Category 1 through 3, if necessary apply the conflicting application criteria, and make a recommendation to the Authorized Officer. Once approved by the Authorized Officer, BLM would offer the applicant, or in some cases more than once applicant may be selected, a nonrenewable or free-use grazing permit. Applicants would be notified by letter if their application were approved or rejected.

Nonrenewable and free-use grazing permits have no priority for renewal and cannot be transferred or assigned.

14 Appendix I – Economic Analysis Methodology

To analyze the economic aspects of the proposed action data and statistics from the years 2010-2019 were used to forecast the grazing costs and market value of cattle produced in Custer County Montana over a hypothetical 10-year Federal Grazing lease beginning in 2020. If county-level data was not available state-level statistics were used. Prices reported from past years were adjusted to their equivalents in 2019 dollars.

Table 1 Producer Price Index for Slaughter Steers and Heifers

Year	Average	Relative to 2019
2010	134.5	124.4%
2011	163.5	102.3%
2012	175.1	95.5%
2013	178.3	93.8%
2014	218.2	76.6%
2015	210.9	79.3%
2016	174.2	96.0%
2017	173.9	96.2%
2018	168.0	99.6%
2019	167.3	100.0%

BLS (2020)

The Producer Price Index (PPI) for Slaughter Steers and Heifers was used to inflation-adjust nominal livestock production values (Table 1). Over 2010-2019 inflation-adjusted producer prices for slaughter cattle varied as much as 25% above and 20% lower than 2019 prices[2].

[2] Montana Ag Statistics 2020, BLS (2020)

Table 2 Cattle Production Values and Grazing Costs per AUM

Year	Prod Val Per Cow/Calf ($2019)	Prod Val Per AUM ($2019)	Grazing Cost per AUM ($2019)
2010	616.73	38.55	16.75
2011	580.19	36.26	16.64
2012	635.35	39.71	16.71
2013	664.29	41.52	16.41
2014	775.02	48.44	16.39
2015	753.03	47.06	16.29
2016	603.82	37.74	16.13
2017	619.11	38.69	16.03
2018	635.82	39.74	16.17
2019	603.51	37.72	16.38

As shown on Table 2, adjusted for inflation, the average production value of a cow/calf pair in Montana 2010-2019 was $649 and there was no clear price trend over this time period. Assuming it requires an average of 16 AUMs to grow one cow to sale-weight, the average inflation-adjusted production value per AUM was $40.54 ($2019).

Also shown on Table 2, the 2010-2019 inflation-adjusted grazing costs per AUM averaged $16.39 and on average grazing fees represented 40% of the average production value per AUM.

Table 3 Average Private Grazing Fees per AUM, MT

Year	Price/AUM (nominal)	Price/AUM ($2019)
2009	$18.00	
2010	$18.40	$22.89
2011	$19.40	$19.85
2012	$20.50	$19.58
2013	$21.00	$19.70
2014	$23.00	$17.63
2015	$23.00	$18.24
2016	$24.00	$23.05
2017	$24.50	$23.57
2018	$24.50	$24.39

As shown on Table 3, between 2009 and 2018 the average price per AUM for private MT grazing land grew steadily from $18 to $24.50[3]. The inflation-adjusted prices across this time period were more variable but the trend was a growth of approximately 1.7% per year.

Table 4 Forecast of Federal Lease Price per AUM

Year	Forecasted Federal Lease Rate per AUM ($2019)
2020	$1.35
2021	$1.37
2022	$1.40
2023	$1.42
2024	$1.44
2025	$1.47
2026	$1.49
2027	$1.52
2028	$1.54
2029	$1.57

The 2020 Federal lease rate is $1.35 per AUM. Assuming the Federal rate grows at the average inflation-adjusted rate of private Montana grazing (1.7%) Federal leases would grow to $1.57 by 2029 and average $1.46 ($2019) per AUM over a 2020-2029 lease.

Analytic Assumptions Used in This Economic Analysis

If all of the AUMs made available represent new livestock that would not have been otherwise grown in Custer County, then their full economic production value is assumed to be due to the proposed action. If all of the AUs made available come from livestock that otherwise would be grazed elsewhere in Custer County, then the authorization would produce no additional economic value, but the difference between the Federal grazing fees and the alternative non-Federal grazing in Custer County could lead to additional local spending in Custer County. In 2020 the difference between private pasture and Federal rates is $21.44 per AUM.

For the purposes of this analysis it is assumed that all of the livestock grazed on the authorizations are in addition to the quantities that would be raised in each planning year under the No Action Alternative would be $40.52 ($2019).

[3] 2019 Montana Ag Yearbook