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Environmental Assessment

Clancy Grazing Reauthorization

**Helena Ranger District
Helena National Forest
Jefferson County, Montana**

Legal Location: T8N R4W, T8N R5W, T7N R4W, and T7N R5W.

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Clancy Grazing Reauthorization

ENVIRONMENTAL ASSESSMENT

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Introduction

The Helena Ranger District of the Helena National Forest is proposing to reauthorize cattle grazing on the Clancy allotment (see Figure 1). There is a two-part decision to be made for authorizing livestock grazing. First, it must be determined whether livestock grazing should be authorized on all, part, or none of the project area. Then - if the decision is to authorize some level of livestock grazing - it must be determined what management prescriptions will be applied to ensure that desired condition objectives are met or that movement occurs toward those objectives in an acceptable timeframe. If the decision is made to reauthorize grazing, these prescriptions would be reflected in a new Allotment Management Plan, which would guide management for an estimated ten years, the typical term for a grazing permit.

The Clancy allotment project area encompasses approximately 7,200 acres. This includes approximately 5,800 acres of National Forest System (NFS) lands and 1,400 private land acres within the project area boundary. The public lands are managed by both the Helena National Forest (HNF), and the Beaverhead-Deerlodge National Forest (B-D), but the allotment is administered solely by the Helena Ranger District, Helena National Forest. Under the current allotment management plan the Clancy allotment is divided into a five pasture modified rest rotation grazing system with a 100 day grazing season. This modified rest rotation system for the Clancy allotment was designed so the three lower pastures (Kady/Locker, Mt. Washington and South Fork Quartz) all received a rest treatment but the two high elevation pastures (Bluebird and Occidental) did not have a rest scheduled in the rotation.

The allotment is located in Jefferson County, west of Clancy and Jefferson City. It lies primarily within the Prickly Pear drainage, and includes portions of Clancy Creek, Kady Gulch, Quartz Creek, and the South Fork of Quartz Creek. The allotment also includes the Occidental Plateau area along the Continental Divide and the upper portions of Snowdrift Creek which drains to the west (Cataract Creek Drainage). Rangeland vegetation includes bunchgrass uplands, timbered range, and riparian bottoms. The part of the allotment located west of the Divide is within the Jefferson Ranger District of the Beaverhead-Deerlodge National Forest. The Clancy allotment lies within portions of four townships: T8N R4W, T8N R5W, T7N R4W, and T7N R5W.

Document Structure

The HNF has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This document discloses the direct, indirect, and cumulative environmental impacts that would result from three alternatives. The document is organized into four parts:

Chapter 1 – Purpose and Need for Action: This chapter includes a short introduction, the document structure, a brief description of the agency's proposal, information on the history or background leading up to the proposal, a statement of the purpose and need for the proposal, the key decisions that need to be made, relationship to some of the pertinent laws, and information on how the interested publics were informed along with the issues generated from those publics.

Chapter 2 – Alternatives, Including the Proposed Action: This chapter provides a more detailed description of the agency's proposed action as well as the current condition described under the no-action alternative and the no grazing alternative. At the end of the chapter is a summary table of the environmental consequences associated with each alternative and how well each alternative moves toward the purpose and need for this action.

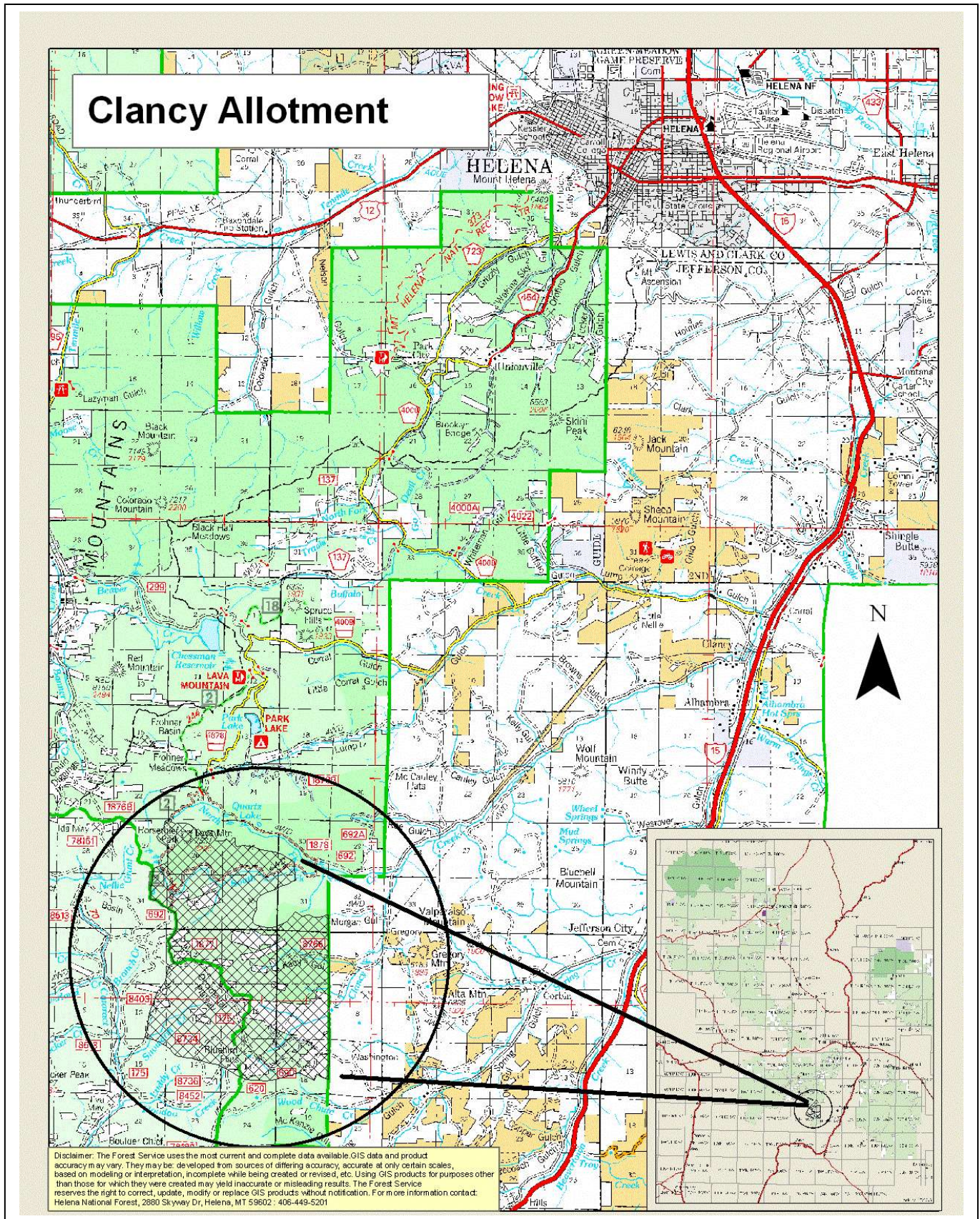
Chapter 3 – Affected Environment and Environmental Consequences: In this chapter, each resource discusses the affected environment or current situation and the anticipated environmental consequences from the alternatives are described. This chapter describes the direct, indirect, and cumulative effects and how well each alternative addresses current issues related to the project and how well the alternatives move toward the purpose and need for this project.

Glossary of Terms, and References, can be found after the Appendices

Appendices: The appendices provide more detailed information pertinent to the decisions to be made that support the analyses presented in this document.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Helena National Forest Supervisor's Office, 2880 Skyway Drive, Helena, MT 59602.

Figure 1-1- Clancy Allotment Vicinity Map



Brief Description of the Proposed Action

The District Ranger of the Helena Ranger District, HNF, proposes to authorize grazing of livestock on the Clancy allotment under a ten-year permit. This decision is implemented through an allotment management plan (AMP). The AMP is developed to make use of available forage without detrimental effects to uplands while protecting riparian and fisheries resources. The AMP would provide opportunities to adapt management as needed, based upon monitoring of both riparian and upland sites.

This proposal establishes a permitted stocking rate of 750 animal unit months with a season from June 16 to September 30 or equivalent AUMs, which serves as the upper limit for the allotment during the term of the permit. This rate is a reduction from the current permitted rate of 1230 AUMs. An adaptive management strategy outlines steps (a sequence of management adjustments) to be implemented if identified monitoring "triggers" are reached (a monitoring result that indicates the need for change). The strategy is designed to ensure that vegetative conditions continue to move toward desired. Stocking rates could be adjusted up or down based on monitoring results, but would not exceed 750 AUMs.

The proposal also includes mitigation measures to address fisheries issues, soil impacts, protect wetland complexes, and localized areas of riparian impacts. Approximately 400 meters of upper Clancy Creek will be protected by an electric fence to help address fisheries issues and riparian conditions. Areas of historic high use will receive less grazing pressure due to the proposed decrease in AUMs. Other areas would be protected by restricting the grazing season. The new plan would employ an adaptive management strategy that allows greater flexibility in grazing strategies to better achieve management goals.

New range improvements would be done under separate NEPA process and would not be a part of the new allotment management plans.

The proposed action was developed in response to public scoping and the input of interdisciplinary team members.

Background/History of Grazing Authorization and Allotment Management Planning

In compliance with the National Environmental Policy Act (NEPA) and 1995 Rescissions Act, the purpose of this project is to authorize livestock grazing on the Clancy Grazing allotment because:

There is Congressional intent to allow grazing on suitable lands when it is consistent with other multiple-use goals and objectives (Multiple-Use Sustained Yield Act of 1960, Wilderness Act of 1964, Forest and Rangeland Renewable Resource Planning Act of 1975, Federal Land Policy and Management Act of 1976, and National Forest Management Act of 1976). It is Forest Service policy to make forage available to qualified livestock operators from lands suitable for grazing consistent with land management plans (Forest Service Manual 2203.1)

Management of permitted livestock grazing is spelled out in the NEPA Decision and then incorporated into an allotment Management Plan (AMP). It is the responsibility of this NEPA analysis and decision to integrate rangeland resource uses with other resource uses of the National Forest System to achieve the statutory mandate of multiple-use, sustained-yield management of renewable resources (FSM 2210.2). The AMP is the primary document which, through implementation of the Clancy NEPA decision, guides implementation of the forest plan direction relative to permitted livestock management on this allotment (FSM 2212).

The existing AMP for the Clancy allotment was signed in 1988. It authorized 230 cow/calf pair for a season from June 16 to September 25, with an additional 50 pair included in a private land permit (for private lands located within the allotment area and grazed in conjunction with the NFS lands). Through the years the actual use on the allotment has changed, in response to the need for resource protection and as permittees changed. In the early 1990s, as many as 350 pair were grazed.

In the late 1990s, the number of cattle grazing this allotment decreased; in fact the allotment was not stocked during the 2001- 2005 seasons. The term permit expired in 2000 and was not renewed. A temporary permit was issued to graze the allotment in 2006 and 2007. In 2008, an existing term permit was

modified to graze the Clancy allotment with 100 pair from June 16 through September 30. No private lands are included within this permit - the permit expires in 2011.

The Clancy allotment was one of the original allotment areas designated in the early days of the Helena National Forest. It originally extended farther northward, including what are now the Frohner and Quartz Creek- Rowe Gulch allotments. It has always been administered as a cattle permit.

Purpose and Need for Action

The goal of this analysis is to determine whether livestock grazing will continue to be authorized on the Clancy allotment and, if so, what level of livestock grazing will be authorized and what management prescriptions will be applied, according to direction and objectives of the Forest Plan and in compliance with applicable laws, regulations, and policies, (i.e. to utilize forage available for livestock grazing as identified in the Forest Plan while meeting other resource objectives).

The proposed action addresses the need to:

- Maintain site productivity - to provide for wildlife needs, to help improve low seral rangelands, to maintain high seral rangelands.
- Improve livestock distribution – to improve range and riparian resource conditions.
- Move existing conditions toward desired, particularly within riparian areas, on areas that are not currently at desired conditions
- Maintain unique vegetative communities such as sedge bogs, wet meadows and aspen communities
- Comply with applicable Forest Plan direction and related laws, including the Rescissions Act of 1995.

Desired Condition

Desired condition for riparian areas is proper functioning condition (PFC).

Proper Functioning Condition – Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to:

- Dissipate stream energy associated with high flows.
- Filter sediment, capture bedload, and aid in floodplain development.
- Improve floodwater retention and groundwater storage.
- Develop root masses for stable streambanks against cutting action.
- Develop diverse ponding and channel characteristics to provide habitat and water depth, duration and temperature needed for fish production and other uses.
- Support greater biodiversity.

For areas identified as functioning-at-risk (FAR), the trend should be toward PFC. Riparian-wetland areas identified as functioning-at-risk (FAR) are in functional condition, but at least one attribute/process gives a high probability of degradation with a high flow event. Recent evaluations of riparian and stream conditions on the allotment indicate some areas are meeting objectives, while other sections are rated as either functioning at risk” or “non-functioning” (lacking the elements listed above for PFC) and are not in compliance with Forest Plan standards and objectives.

The objective for uplands is to improve low seral rangelands. Inventories indicate that upland conditions on primary and secondary range are generally moving toward desired conditions. The presence of timothy and Kentucky bluegrass, both introduced grasses, reduces the available forage from native plant species on some sites. It is difficult to reduce the prevalence of these introduced species, regardless of whether or not an area is grazed. Without implementing costly management and restoration activities, their presence will continue on the landscape.

In 1995, Congress enacted Public Law 104-19 (commonly referred to as the “Rescissions Act”), which required the Forest Service to establish and adhere to a schedule for the completion of NEPA analyses for grazing allotments needing such analysis. The Clancy allotment was identified as an allotment subject to the Rescissions Act and requiring NEPA analysis.

Decisions to be Made

The District Ranger, Helena Ranger District, Helena National Forest, is the deciding official for this project. Given the purpose and need for this action, the District Ranger will review the three alternatives, the anticipated effects, and public input and make the following decisions:

- Whether livestock grazing should be reauthorized on all, part, or none of the project area.
- If the decision is to reauthorize some level of livestock grazing - what management prescriptions will be applied to ensure that desired condition objectives are met or that movement occurs toward those objectives in an acceptable timeframe. If the decision is made to reauthorize grazing, these prescriptions would be reflected in a new Allotment Management Plan.

Once the evidence has been compiled and evaluated, consistency with the Forest Plan will be determined and an alternative selected. A final determination on the significance of the impacts of implementing the selected alternative will be made, i.e. if a Finding of No Significant Impacts (FONSI) is warranted. If a FONSI is signed, establishing that further documentation in an Environmental Impact Statement is not required, a Decision Notice documenting the decision will be published.

Relationship to Pertinent Plans, Laws, and Regulations

Forest Plan

The Forest Plan (1986) directs management of all Federal lands within the project area. The Forest Plan establishes Forest-wide goals and objectives and management area (MA) direction for the multiple uses of the renewable resources as well as standards and guidelines to assure sustained productivity of the land and protection of the environment.

The Forest-wide goals and objectives for range, particularly on pages II/5 of the Forest Plan, discuss management of vegetation to provide optimum forage conditions for livestock, as well as the continuation of forage production and use while protecting soil and water resources, riparian areas, and threatened and endangered (T&E) species and controlling noxious weeds. Forest-wide standards for range (page II/22) address riparian conditions, range resource damage, the use of best management practices (BMPs), and incorporation of utilization standards into Allotment Management Plans to protect soil and water quality. The Forest Plan specifies that guides for allowable use of key species, by condition class, are in the Range Management Handbook (FSH 2209.21). The Forest Plan provides specific goals and objectives for riparian areas (pages II/34-36), including levels of livestock utilization for generalized vegetation types.

The specific MAs discussed in Chapter III of the Forest Plan contain additional direction in regard to appropriate livestock grazing and range management activities, given the management goals specific to that MA. The Clancy allotment includes six Forest Plan MAs. Management Areas and their associated management standards for range are displayed in Table 1.1.

Table 1.1. Management Areas within the Clancy Allotment.

Management Area HNF	% of Allotment Area	Management Standards for Range
L-1 Forest Plan Page III/11	25%	<p>Livestock grazing will generally be maintained at or above 1983 levels, unless a range analysis or monitoring indicates there is a need to change.</p> <p>Vacant allotments will be restocked if a range analysis shows it to be feasible and a demand exists for additional AUMs.</p> <p>Intensive management systems will be implemented, where cost-effective, to sustain forage production. Management systems will be designed to minimize conflicts with wildlife.</p> <p>Forage improvement projects such as sagebrush burning, tree encroachment burning, and noxious plant control will be carried out on a scheduled basis. The schedule will be developed as part of the allotment management plans.</p> <p>Improvements, such as cattleguards, fences, and watering facilities, will be maintained and reconstructed as needed to continue present levels of grazing. New improvements may be constructed if the need is identified in an approved allotment management plan.</p>
L-2 Forest Plan Page III/14	2%	<p>Livestock grazing will generally be maintained at or above 1983 levels, unless a range analysis or monitoring indicates there is a need to change.</p> <p>Chemical or mechanical control of invading vegetation should be considered only if needed to improve or maintain forage production.</p> <p>Forage improvement projects, such as sagebrush burning, tree encroachment burning, and noxious plant control will be carried out on a scheduled basis. The schedule will be developed as part of the AMP and in coordination with a wildlife biologist.</p> <p>When an existing barrier is intersected by structural improvements, such as cattleguards, fences, and watering facilities, will be maintained or reconstructed as needed to continue present levels of grazing. New improvements will be constructed if the need is identified in an approved AMP.</p>
M-1 Forest Plan Page III/5	1%	<p>Livestock use may remain at the 1983 level if the area is within existing allotments. Maintain range improvements and build new improvements, if they are needed to facilitate management of adjacent areas.</p>
T-1 Forest Plan Page III/31	45%	<p>Livestock grazing is compatible, except where it conflicts with stand establishment. Fencing, temporary herding, or other techniques may be used to protect regeneration where needed. Livestock grazing will be maintained at the 1983 levels within existing allotments, however, the level may be increased or decreased if monitoring or range analysis shows a need or opportunity to change.</p> <p>Pasture and allotment boundaries should be maintained during and following timber harvest. This may require additional fencing, where natural barriers are breached by timber sale activities.</p>
T-5 Forest Plan Page. III/47	2%	<p>Livestock grazing will generally be maintained at or above the 1983 levels, unless a range analysis indicates there is a need to change. Vacant allotments will be restocked if a range analysis shows it to be feasible and demand exists. Transitory range resulting from timber harvest will be integrated into the allotment planning process.</p> <p>Intensive management systems will be implemented, where cost effective, to develop the range resource for sustained forage production. Management systems will be designed to minimize conflicts with wildlife. Forage improvement projects such as sagebrush burning, tree encroachment burning and noxious plant control may be carried out on a scheduled basis. The schedule will be developed as part of allotment management plans. Existing structural improvements, will be maintained or reconstructed as needed to continue present levels of grazing. Additional improvements may be built if the need is identified in an approved allotment management plan.</p>

W-1 Forest Plan Page III/51	5%	Livestock grazing does not generally occur in this management area, except for minor amounts within existing allotments. Livestock grazing will continue within active allotments, however, the level may be increased or decreased if monitoring or range analysis shows a need or opportunity to change.
Management Area B-D	% of Allotment Area	Management Standards for Range
Basin – Cataract Beaverhead- Deerlodge Forest Plan Pg.III-25	20%	Grazing Opportunities: Sustainable grazing opportunities are provided for domestic livestock from lands suitable for forage production. Forage Use: Use of forage by domestic livestock will maintain or enhance the desired structure and diversity of plant communities on grasslands, shrub lands, and forests. Use will be managed to maintain or restore riparian function as defined in the allotment management plan.

Laws and Regulations

Many of the pertinent laws and regulations were discussed under the above introduction to this document, and the purpose and need for the project. There are other laws, regulations, and policies not specifically listed here but taken into account by the various resource specialists during the analysis (i.e. the National Historic Preservation Act of 1966 as amended, Clean Water Act of 1948 as amended, Endangered Species Act of 1973 as amended, etc.). See the individual resource sections within this document and the specific resource specialist's reports filed in the project record for additional information on these laws and regulations.

Public Involvement

This project was originally scoped in 1998. The purpose at that time, which is still applicable today, was that all grazing allotments must have National Environmental Policy Act (NEP A) analysis completed on them. This is in conformance with the Rescissions Apt of 1995 (PL. 104-19), which requires that each National Forest System unit establish and adhere to a schedule for the completion of NEP A provisions on all grazing allotments for which NEP A analysis is needed. The project was put on hold from 1999-2004. Then in 2004, a letter requesting input on the management of the Clancy allotment, and four other allotments in the Clancy-Unionville area was mailed to individuals who had expressed interest in livestock grazing activities in this area. As a result of scoping and analysis it was determined that the Clancy allotment did not fit the requirements for a categorical exclusion, therefore a new proposal and further analysis would be required. Information received in response to the 2004 letter, discussions with the livestock permittee, and analyses of resource conditions by HNF specialists were used in helping the HNF refine the proposed action for this project.

In May of 2008, a scoping letter describing the agency's proposal for the Clancy allotment and seeking public comment was mailed to state, federal, and local agencies as well as individuals who had expressed interest in livestock grazing activities on this allotment. No comments were received in response to this letter.

This project has also appeared on the quarterly schedule of proposed actions (SOPA), which provided an early informal notice for the public of this activity. This current effort for the Clancy allotment has been listed on the SOPA since April of 2009. Opportunity for the public to get involved with this project was also posted on the Helena National Forest website under 'Projects and Plans'. Available at this site was the scoping letter (including map) and a public comment sheet.

Agencies Contacted

The May 2008 scoping letter was sent to the following federal, state, and local government agencies: Beaverhead-Deerlodge National Forest (Phillipsburg, MT), US Environmental Protection Agency (Helena, MT), US Fish and Wildlife Service (Helena, MT), Montana Department of Fish, Wildlife, and Parks (Bozeman, MT; Helena, MT; Townsend, MT), Jefferson County Board of Commissioners (Boulder, MT). This EA will be sent to the same agencies for review.

Issues

Scoping is an early and open process involving interested publics to help identify important issues. This helps to determine the extent of analysis necessary for an informed decision. This process also helps to determine the resource membership of the interdisciplinary team, depending on the complexity of the action and potential issues at hand. Because there were no comments received issues were identified based on review by the ID Team. In respect to the scope of the Clancy Grazing Reauthorization analysis, the decision space is limited to changes in grazing management within the allotment boundaries.

The comments received from the 2004 scoping were evaluated to determine if any key issues surfaced that would result in additional alternatives. No comments were received that suggested a new alternative needed to be developed.

In this scoping process, it was determined that there were no significant issues that would warrant the development of additional action alternatives. Those suggestions that were incorporated into the refinement of the proposed action were considered not to be a substantive change and were used to adapt the proposed action.

Effects to the following resources were also considered: range vegetation, hydrology, fish, wildlife, soils, heritage, noxious weeds, recreation, and sensitive plants.

Project Record

This document hereby incorporates by reference the Project Record (40 CFR 1502.21). The Project Record contains Specialist Reports and other technical documentation used to support the analysis and conclusions in this document. These Specialist reports are for those resources represented in the Clancy allotment area that are potentially impacted by the proposal.

Relying on Specialist Reports and the Project Record helps implement the CEQ Regulations' provision that agencies should reduce NEPA paperwork (40 CFR 1500.4), that documents shall be analytic rather than encyclopedic, and the documents shall be kept concise and no longer than absolutely necessary (40 CFR 1502.2). The objective is to furnish enough site-specific information to demonstrate a reasoned consideration of the environmental impacts of the alternatives and how these impacts can be mitigated, without repeating detailed analysis and background information available elsewhere. The Project Record is available at the HNF Supervisor's Office, Helena, MT.

Chapter 2, Alternatives, Including the Proposed Action



Introduction

This chapter describes and compares the alternatives considered for the Clancy Grazing Reauthorization project. It includes a discussion of how alternatives were developed, alternatives considered but eliminated from detailed analysis, alternatives considered in detail and their descriptions, and a comparison of the alternatives in a tabular form. Chapter 2 is intended to present the alternatives in comparative form, providing the basis for choice by the responsible official and the public.

In the discussions in Chapter 2 and 3, the following terms are used to refer to the different numbers of livestock, and levels of use, allowed. It is important that the reader understand these terms in order to differentiate among the alternatives.

Authorized use – is the use specified on the annual bill(s) for collection and verified by permittees' payment of fees.

Permitted use – is the number of animals, period of use, and location of use specified in Part 1 of the grazing permit, which is typically issued for a term of 10 years.

Actual use – is the use that actually occurred on the allotment during the grazing season; this includes number of livestock actually on the allotment and time spent on the allotment.

Information presented in the table at the end of this chapter summarizes the scientific analyses from Chapter 3 – Affected Environment and Environmental Consequences. For clarification of the information displayed at the end of Chapter 2 and for a full understanding of the effects, the reader needs to consult Chapter 3 and the detailed specialist reports filed in the project record.

Alternative Development Process

The Clancy AMP interdisciplinary team (IDT) used several different means in gathering information to help in developing the range of alternatives including mitigation as well as ensuring the pertinent issues or concerns in regard to this action are addressed in the analysis. Several IDT meetings were held to review public comments to 2004 scoping and refine the proposals for each of five allotments being considered at that time, including Clancy. Additionally, individual team members used a variety of other information to develop recommendations to further refine and update the proposed action, including monitoring and adaptive management. Information used varied by resource area, but typically included data and observations gathered from recent field reviews, comparisons with past data, review of past/historic records and files, and discussions with past and present permittees. Several modifications to the proposed action resulted from this interdisciplinary review including, a decrease in cattle numbers; changes to the rotation schedule in order to reduce impacts to riparian areas, and to better control livestock movement within the allotment. These changes were not considered to be substantive in nature, did not change the intent of the project, and still met the Purpose and Need. Alternative 2 incorporated these modifications to the Proposed Action for this analysis process. The original comment letters and the agency's responses are filed in the project record and available for review upon request. A summary of the public comments and responses is attached in Appendix B.

Alternatives Considered in Detail

There are three alternatives considered in detail in this analysis. Alternative 1, the No Action Alternative represents the current management of the Clancy allotment as authorized in the existing AMP. Alternative 1 is the baseline condition used to compare with Alternatives 2 and 3. Alternative 2, the Proposed Action, includes a reduction in the *permitted* number of livestock (relative to the 1988 AMP), restriction of timing of grazing in three pastures to minimize impacts to streams (in response to spawning westslope cutthroat trout and wetland vegetation), and incorporation of an adaptive management strategy into the AMP. Alternative 3, the No Grazing Alternative, considers that grazing would no longer be authorized on the allotment. Each of these alternatives is described in detail below.

Alternative 1 – No Action - Current Management

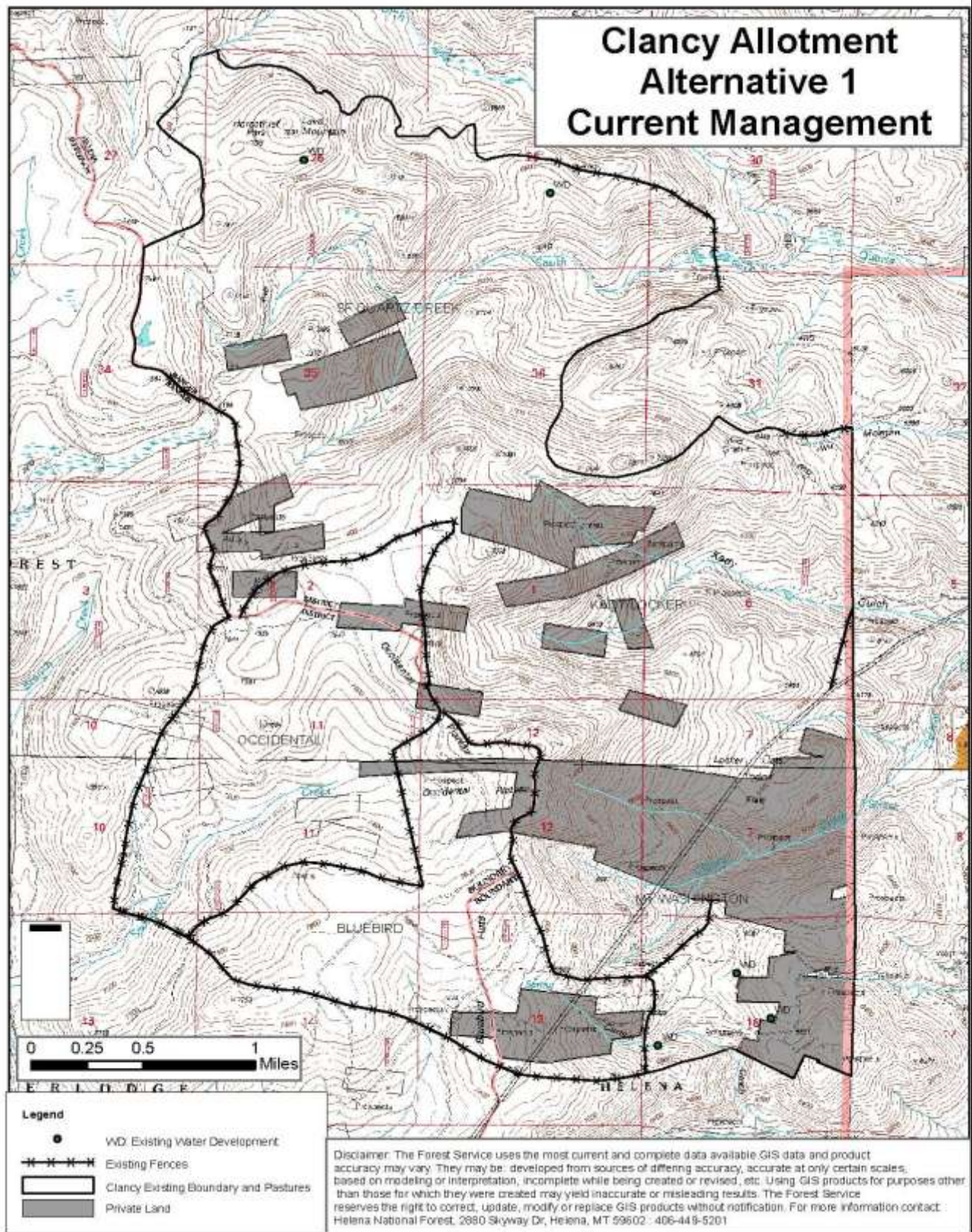
The Council on Environmental Quality (CEQ) regulations (40 CFR 1502.14d) requires that a “no action” alternative be analyzed. This alternative represents the existing, baseline condition or trends in which the other alternative(s) is compared. This helps demonstrate how the other alternative(s) would move toward or meet the Purpose and Need for this analysis.

Current management of the Clancy allotment is broadly guided by an AMP signed in 1988. The existing AMP sets grazing levels at 280 cow/calf pair within a season of June 16 – September 30 (about 1240 AUMs). The grazing season was identified as a modified rest rotation strategy with five pastures. This rotation system for the allotment was designed so the three lower pastures (Kady/Locker, Mt. Washington and South Fork Quartz) all received a rest treatment but the two high elevation pastures (Bluebird and Occidental) did not have a rest scheduled in the rotation.

While it is true that over the last 20 years administrative changes have been made in response to changes in various conditions, including resource conditions and changes in permittees, for the purpose of evaluating this alternative, in this environmental assessment, it is assumed that management would continue under levels and conditions of use similar to those represented by the existing AMP. Existing improvements (fences and water developments) would continue to be maintained. Figure 2.1 shows the current allotment boundary and existing improvements.

Actual use for the last three grazing seasons has ranged from 85 to 100 cow/calf pair with grazing seasons usually ending in late September (410-430 AUMs). Over the past 20 years actual use has been less than authorized under the 1988 AMP due to resource protection, five years of non-use from 2001-2005, recent changes in the permit holder and the opportunity to adjust livestock numbers downward from the historic use.

Figure 2-1 Clancy Allotment Alternative 1-Current Management



Alternative 2 - Proposed Action

Alternative 2 was developed as described in Chapter 1, due to the need to protect spawning fish, improve riparian and wetland conditions, and to provide opportunities to adapt management in response to monitoring results. Specifically, Alternative 2 includes timing limitations to livestock use in two pastures to reduce impacts to spawning westslope cutthroat trout and facilitate improvement of riparian vegetation. Timing restrictions in another pasture would promote improvement in wetland vegetation. Authorized livestock levels in the new allotment management plan would be reduced from those in the previous plan (1988), to levels believed to better distribute livestock and increase vegetation throughout the allotment. This alternative includes an adaptive management strategy that outlines how monitoring would be used to adjust management of both upland and riparian areas.

Cattle grazing would be reauthorized on the Clancy allotment through a term grazing permit for a maximum of 160 cow/calf pair for a season of June 16 - September 30. Specifically:

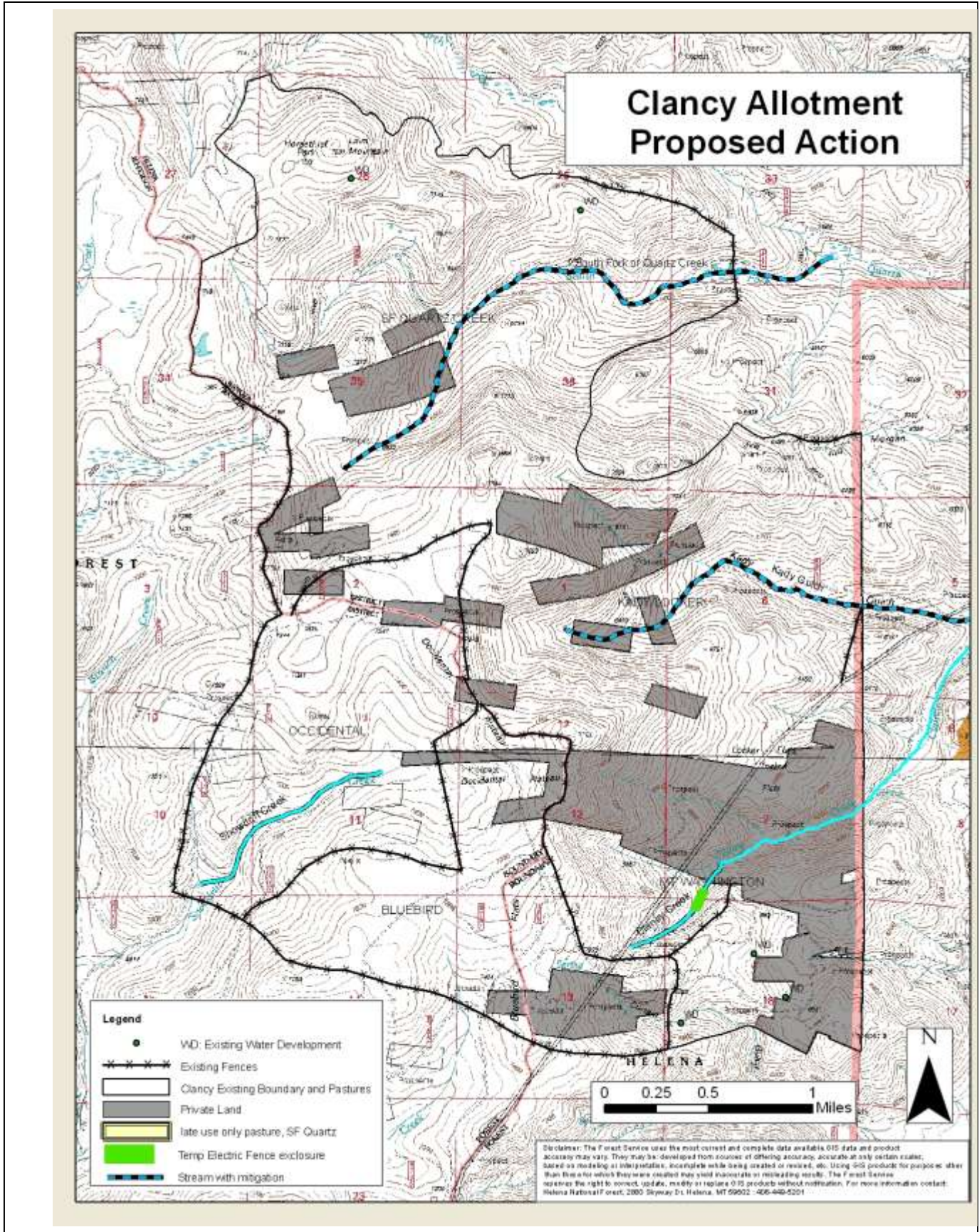
- authorized use at 571 head months or 750 animal unit months
- deferred rotation grazing system with five pastures with the following modifications;
 - Cattle use in Kady Gulch and the South Fork of Quartz Creek will be after August 31 to mitigate spawning areas for westslope cutthroat trout.
 - When Kady/Locker Flats pasture is used, a portion of Clancy Creek on National Forest land will be protected with a temporary fence.
 - The South Fork of Quartz pasture would not be put in the pasture rotation on an annual basis; it will be used only on an “as needed” basis. When this pasture is used in the rotation it will be for late season grazing only.
- monitor Snowdrift Creek riparian and stream bank conditions to determine whether an off site watering system or riparian fence is needed to move the riparian area toward an upward trend.
- no salt within ¼ mile of water sources, heritage sites, or developed recreation
- maintain existing range improvements, this includes about 15 miles of fence, five water tanks; reconstruct/ replace existing improvements as their useful life expectancy is diminished.
- evaluate range readiness annually and defer turn-on dates as appropriate
- evaluate short term monitoring to adjust pasture move dates and move dates off the allotment
- incorporate the overall grazing objectives of the Forest Plan and Divide Landscape Analysis.

The stocking rate for the Clancy allotment would not exceed 750 animal unit months (AUMs) during the grazing season of June 16 – September 30. This is 40% fewer AUMs or season of use than permitted in the 1988 plan. The effects of grazing at this level on resource conditions are expected to allow areas of concern to heal and become more productive. This upper limit of 750 AUMs also reflects the estimated annual forage production available for cattle on the allotment considering climate, proper livestock management, as well as proposed grazing period, grazing occurrence, timing, frequency, and intensity. The actual “turn out” date for livestock, at the beginning of the season, would continue to be based on range readiness – when winter snowmelt had ended, soil is no longer saturated, and key forage species are approximately eight inches high or the seedheads are in the “boot” stage.

The following restrictions to the timing of use in certain pastures are proposed:

- Cattle use in Kady Gulch and the South Fork of Quartz Creek Pastures will be after August 31 to mitigate spawning areas for westslope cutthroat trout.
- When Kady/Locker Flats pasture is used, a portion of Clancy Creek on National Forest land will be protected with a temporary electric fence.
- The South Fork of Quartz Creek pasture would not be put in the pasture rotation on an annual basis, it will be reserved for an “as needed basis.” When this pasture is used in the rotation it will be for late season grazing only. The impacts of wildfire or drought to livestock management are two of few reasons the pasture would be “needed.”

Figure 2-2 Clancy Allotment Proposed Action



Adaptive Management

Alternative 2 would incorporate an adaptive management strategy that outlines possible management responses when monitoring indicates that livestock use is not resulting in the intended effects. The intended effects are described above – under Desired Conditions.

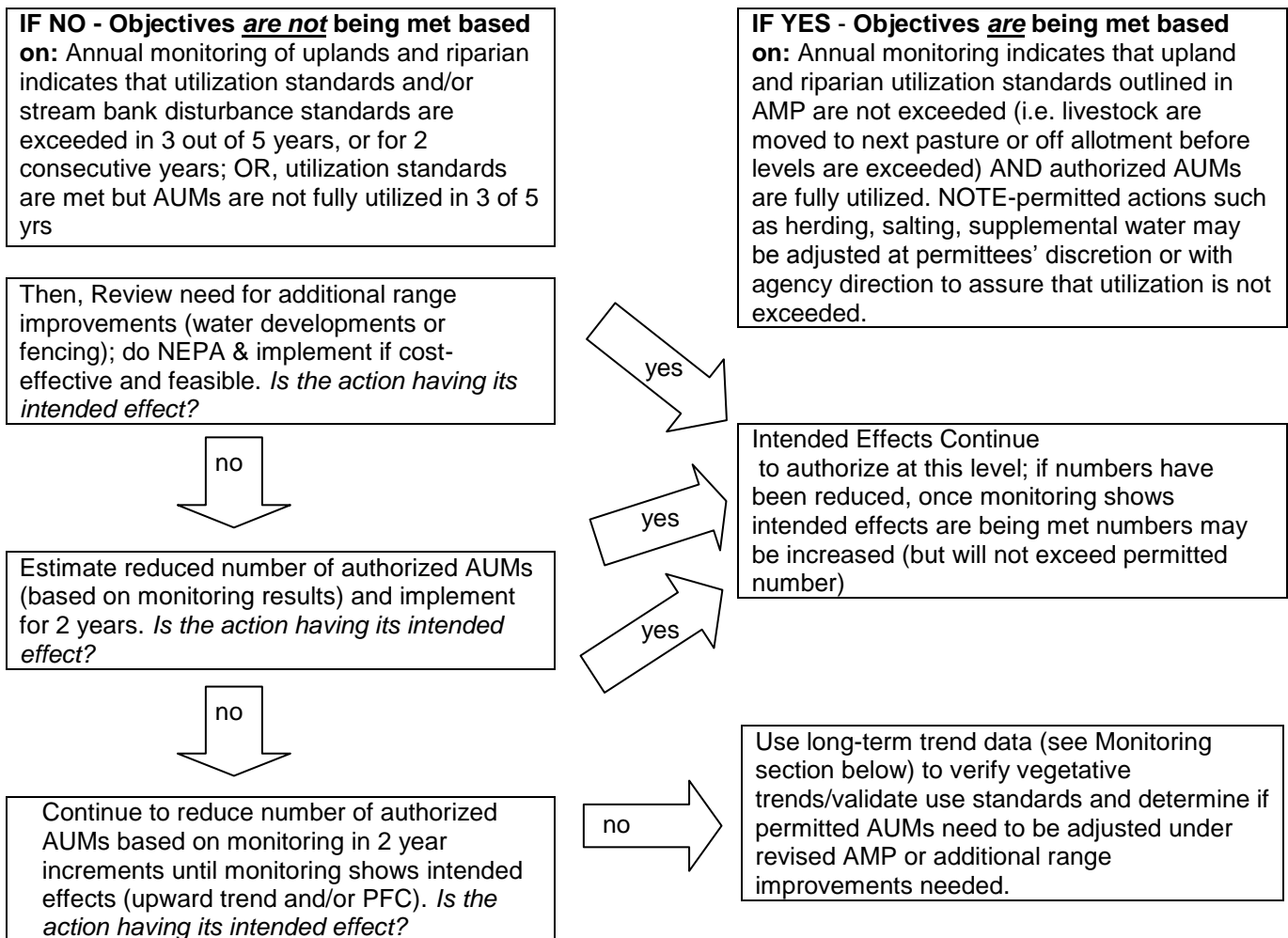
Adaptive management is defined in agency NEPA policy as:

A system of management practices based on clearly identified intended outcomes and monitoring to determine if management actions are meeting those outcomes; and, if not, to facilitate management changes that will best ensure that those outcomes are met or re-evaluated. Adaptive management stems from the recognition that knowledge about natural resource systems is sometimes uncertain. (36 CFR 220.3)

Figure 2.3 outlines how the initial management action, described above for Alternative 2, would be adjusted based upon annual monitoring. This table follows guidance in the NEPA handbook, FSH 1909.15, Section 14.1. Exhibit 01. Monitoring triggers are described below and the arrows indicate the series of decisions to be made. This guidance would be included in the new AMP and become part of the permit.

Figure 2.3 Adaptive Management Strategy for Clancy Allotment, Alternative 2

Initial Management Action - Is the action having its intended effect?



The initial management action, designed to address particular needs on the Clancy would be monitored and evaluated. Adaptive management decisions would be based upon these evaluations, relative to resource objectives described above. This follows a circular approach (assess-design-implement-monitor-evaluate-adjust) to adaptive management (Murray and Marmorek 2003), that is purposeful (based on agreed-upon objectives) and integrative (interdisciplinary; evaluating effects to several resources). This facilitates learning in the face of management changes with consequences and effects which cannot be perfectly predicted, and provides the basis for changes in subsequent actions (Stankey et al. 2005).

General Features and Mitigation Common to Both Grazing Alternatives (Alternatives 1 and 2)

Desired Condition

Riparian areas are in properly functioning condition (PFC). For areas identified as functioning-at-risk, the trend should be toward PFC. Riparian conditions, both existing and desired, are discussed in detail in Chapter 3, Hydrology, and Fisheries. The desired future condition of uplands is to improve low seral rangelands by reducing bare soil and increasing native species where feasible. Existing and desired conditions of uplands are discussed in Chapter 3, Range.

Grazing Permit

Under Alternatives 1 and 2, a term grazing permit would be issued to the current permittee, following agency guidance (FSM 2230 and FSH 2209.13). Grazing permits are typically issued for a term of 10 years. Each permit includes three parts. Part 1 identifies the permittee and the number, kind, and class of livestock as well as the period of use for the allotment. Part 2 "General Terms and Conditions" provides standard guidance that applies to all allotments. This part incorporates the current allotment management plan into the permit. It also addresses the permittee's responsibility to provide a proportionate share of cooperative range improvements. The permit establishes the permittee's responsibility for maintenance of all assigned range improvements to specified standards. The general terms and conditions also establish that permanent structural range improvements are the property of the US Government.

Part 3 of the permit, "Special Terms and Conditions," incorporates general standards and guidelines from the Forest Plan (Pages II/22-36) for range activities and specific guidelines for riparian conditions. Also included in Part 3 are utilization standards (see Table 2.1) and specific management area guidance. Livestock grazing would take place under management direction contained in Part 3.

Livestock Management

Potential actions that may be used to achieve or move towards the desired condition on the Clancy allotment include those that fall under the categories of livestock management and structural improvements. Monitoring will dictate the need for implementing adaptive changes in management.

- Salt and mineral supplements may be used to aid cattle distribution. In particular they may be used to help make better use of upland forage areas that are under utilized, and thereby lessen use in areas of heavier use.
- Herding of livestock may be used to accomplish a number of goals: to get cattle into areas of low use, to keep cattle out of high use areas or sensitive areas, or to break up concentrations of the herd into smaller less impactful groups of cattle.
- Season of use/timing of grazing may be used to decrease impacts to the forage and riparian resources. For example: depending on the needs of a specific area, timing may be prescribed to lessen bank disturbance by limiting grazing to the dryer part of the season, or to early season grazing to allow for browse species to recover. Timing of grazing also allows for the benefits of grazing during the dormant season or early season grazing allowing regrowth during that year.
- Frequency of grazing applies to opportunities for use of a given area, either within a given grazing season or with a time period of several years. Frequency of grazing may be controlled by changing

the length of time livestock spend in a given pasture or allotment within the grazing season or by resting a pasture or allotment for a grazing season.

- Duration of grazing in a particular allotment or pasture is a very important factor in improving rangeland health. On many allotments limitations of duration rather than livestock numbers has been shown to be a major factor in improving range conditions.
- Intensity of grazing, tied to utilization rates, can be controlled to improve rangeland conditions. Utilization rates can be adjusted to help increase productivity by providing for more organic materials left on site. This can be done through better cattle distribution or shortening of the time of use in a pasture.

Structural Improvements

Water developments have traditionally been used to increase amount and extent of primary rangeland by enabling cattle to use areas that are far from natural watering

Utilization

According to the allotment files, the acceptable utilization level for the entire allotment was 55% (by weight) for the grazing seasons 1989-1991. The acceptable utilization levels (according to the Range Management Handbook - FSH 2209.21) and riparian areas (per the Forest Plan, page II/36 and) for the allotment from 1992-2008 are shown in the following table.

Table 2.1. Upland Utilization Standards (in percent)

	Dominant Vegetation	Early Pasture % Use	Mid/Late Pasture % Use
Rest rotation	Grass/grasslike/forb (uplands)	60%	40%
Deferred rotation	Grass/grasslike/forb (uplands)	50%	35

*The "early" pasture is the pasture(s) used first and/or until approximately August 31. The "late" pasture is the pasture(s) used after this date.

More stringent standards would be applied in the following riparian areas:

Table 2.2 Grazing Standards for Specific Stream Segments

	Kady Gulch	Kady Gulch	South Fork Quartz (key area)
Aggregate ¹ /Resiliency ²	26/Moderate	26/Moderate	27/Moderate
Reach	1	2	2
Similarity ³ /Functionality ⁴	PFC/High	PFC/High	PFC/High
Floodplain Utilization	Early =50% Late=30%	Early =50% Late=30%	Early =50% Late=30%
Stubble Height	N/A	N/A	NA
Woody Utilization	30%	30%	30%
Bank Disturbance	N/A	NA	NA
Floodplain Soil Disturbance	N/A	NA	NA

¹**Aggregate**-A group of riparian sites with similar landtype, parent material (geology) and landform

²**Resiliency**- The inherent recovery potential or response to grazing. Some aggregates have favorable characteristics and recover more quickly from grazing disturbance (High resiliency). Some aggregates are physically very susceptible to grazing disturbance (Low resiliency).

³**Similarity**- How similar a stream reach is to a set of conditions conducive to sustaining healthy, diverse and functional riparian systems. Some riparian reaches have physical characteristics and plant communities that reflect low or moderately low grazing disturbance (High similarity). Some riparian reaches have physical characteristics and plant communities that reflect intense long-term grazing disturbance (Low similarity).

⁴**Functionality** –See PFC discussion in Chapter 1, page 3 above.

Mitigation and Best Management Practices (BMPs)

Mitigation and best management practices applicable to grazing activities are described in detail in Chapter 3, for noxious weeds (per FSM 2080), heritage resources, forest vegetation, and soils. These actions, which would apply to both Alternatives 1 and 2, are summarized in Table 2.3.

Table 2.3 Best Management Practices and Mitigations for Grazing

Objective for Mitigation or BMP	Summary of Action(s)
Reduce establishment and spread of noxious weeds by minimizing ground disturbance and bare soils (see Ch. 3, Noxious Weeds)	Revegetate bare soil from grazing activities and check areas of concentrated livestock use for weed establishment and treat new infestations. Clean all off road equipment before moving into the project area; clean all equipment prior to leaving the project site if operating in weed infested areas. These specific practices are outlined in the grazing permit and annual operating instructions. Weeds on the allotment are treated under the Forest-wide noxious weed treatment program. Forage utilization standards are designed to maintain the vigor of desirable plant species, and maintain healthy desirable vegetation that is resistant to noxious weed establishment.
Assure compliance with National Historic Preservation Act (see Ch. 3, Heritage Resources)	Range improvements would not be placed atop currently identified cultural resources unless appropriate mitigation/protection measures have been implemented. Cultural resource field surveys would precede all ground-disturbing range projects unless the affected area has been previously inventoried for range or other agency projects. Range improvements may proceed as planned when a project-affected cultural resource(s) is determined not to be archaeologically or historically significant by the Forest Archaeologist, per 36 CFR 60 and FSM 2363.2.
Sustain and/or improve soil productivity	With the adaptive management strategy, if annual or long-term trend monitoring indicates a decline in rangeland ecosystem health, then on a site-by-site basis soil monitoring may be implemented to help identify the cause of resource decline and/or soil mitigation, BMPs or restoration actions may be prescribed to improve resource conditions.

Monitoring

Monitoring for allotment management is guided by the Forest Plan and by policy. Allotment administration includes steps taken each year to evaluate successes and problems. Each permittee is provided with an annual “report card” documenting progress toward short-term and long-term goals and permittee compliance. These are discussed each winter in an annual permittee meeting. These meetings are also used to adjust strategies for the upcoming grazing season, which are documented in annual operating instructions that include such considerations as livestock numbers, season and duration of use, improvements, and maintenance.

Prior to the anticipated turn-on date, permittee maintenance of range improvements is inspected by agency personnel. Range readiness is evaluated, as needed, to determine the actual date that livestock can be moved onto the allotment at the beginning of the grazing season. Soil conditions and development of grasses are assessed to assure that livestock use can be sustained without damage to sensitive resources. Agency inspections (by range personnel) and permittee’s reports, along with input from other resources, are reviewed at year-end relative to resource objectives. This information is used to prepare the annual report card and to develop a strategy for the upcoming grazing season.

Monitoring of vegetation and other resource conditions addresses both uplands and riparian areas and includes both annual implementation monitoring and long-term effectiveness monitoring, as described in Table 2.4. The monitoring outlined in this table would apply to both Alternative 1 and Alternative 2.

Recently, a Riparian Monitoring Strategy was approved by the HNF which outlines how riparian monitoring will be accomplished (USDA FS, 2009).

Table 2.4 Allotment Monitoring for Upland and Riparian for Alternatives 1 and 2

	Short-term (Implementation Monitoring)	Long-term (Effectiveness Monitoring)
Uplands	<p>Annual permit compliance including utilization of key upland forage species. Areas to be monitored would include a representative site in each pasture. Per FP standards, following the standards identified in Forest Plan Monitoring Element D1.2 Available Forage used by Livestock. See Table 2.1 for utilization numbers. Meets FP Monitoring Requirement D5 for range (“permit compliance”) +/- 10% change from annual operating instructions</p>	<p>Establish a photo point in a representative area in each pasture.</p> <p>Meets FP Monitoring Requirement D4 for range (“condition and trend of range; and forage availability”)</p>
Riparian	<p>Annual permit compliance, including streambank disturbance monitoring.</p> <p>Annual monitoring in accordance with the Helena National Forest Riparian Monitoring Strategy would be completed at the PIBO implementation monitoring location annually</p> <p>See Tables 2.1 and 2.2 for utilization numbers.</p> <p>Meets FP Monitoring Requirements D5 for range (“permit compliance”) and parts of C12 for riparian (“Streamside cover, forage utilization and streambank trampling”).</p>	<p>Establish Pacific Inland Biological Opinion (PIBO) riparian monitoring.</p> <p>Plots are established-at the following locations</p> <p>Kady – T7N, R4W sec6 Snowdrift – T&N, R5W sec 11 SF Quartz – T8N, R4W sec 30</p> <p>Following the procedures described in the Helena National Forest Riparian Monitoring Strategy (PACFISH/INFISH Biological Opinion Effectiveness Monitoring Program (PIBO-EM)</p> <p>Meets FP Monitoring Requirement D4 for range (“condition and trend of range; and forage availability”) and C12 for riparian (“Streamside cover, plant & animal communities, forage utilization and streambank trampling”).</p>

In conjunction with collection of annual utilization and streambank disturbance information, livestock impacts to known heritage sites (See Chapter 3, Heritage) would be assessed. If unacceptable impacts are observed, immediate measures such as herding and salting would be employed to protect them and the Forest Archaeologist would be notified. If these methods are not effective and damage continues, measures such as fencing would be considered and additional site-specific analysis performed as needed.

Alternative 3 – No Grazing

Forest Service Handbook, (FSH 2209.13 - Grazing Administration Handbook, Chapter 90 – Rangeland Management Decision making), identifies the need to analyze the “no grazing” alternative.

Under this alternative, term grazing permits would not be reissued for the area currently included within the boundaries of the Clancy allotment. The allotment would be considered for permanent closure. Drift fences and any interior pasture fences would be removed. Fences along National Forest System (NFS) boundaries and private in-holdings would remain, as these belong to private landowners. The interior

fences and existing water developments on the allotment would have to be removed because there would not be a permittee to assign the maintenance. Permittees would be reimbursed for their cost share of cooperative range improvements where they participated in the development (FSH 2209.13, Chapter 70).

The monitoring described for Alternatives 1 and 2 would not occur.

Comparison of Alternatives

This section provides a comparison of how the three alternatives respond to the Purpose and Need for action and how each responds to the issues identified during scoping and analysis. This section also displays the projected outputs of the project and environmental effects that may influence alternative selection. Based on this information and the information provided in Chapter 3, the deciding official and the public should be able to see the differences between the effects for each alternative and the tradeoffs between the alternatives. The overall reason for these comparisons includes providing a clear basis for choice among options by the decision maker and easy comparison for the public.

The following tables compare the design features between the alternatives. Chapter 3 of this EA and the Specialists Reports found in the project file provide the details of the effects in support of the summaries included within the following tables.

Table 2.5 Summary Comparison of Features of Alts 1, 2, and 3

FEATURE	Alternative 1	Alternative 2	Alternative 3
Livestock grazing authorized	YES	YES	NO
Authorized grazing capacity (per AMP)	1240	750	0
Monitoring	YES	YES	NO
Adaptive management	NO	YES	NO

The following table includes the summary comparison of the resources effects of implementing Alternatives 1, 2, or 3. The detailed analysis of issues is found in Chapter 3 in each resources section and in the Resources Specialists report in the project file.

Table 2.6 Summary Comparison of Effects of Alts 1, 2, and 3

Issues and/or Resource Specific Effects	Alternative 1	Alternative 2	Alternative 3
Riparian Conditions (see Hydrology and Fisheries)			
Kady	Kady Creek was rated as Properly Functioning (PFC) except for a reach approximately 850 meters in length (T7N R4W Section 6), which was rated as FAR with no apparent trend	By delaying livestock turnout until September 1 of each year on the South Fork of Quartz Creek and Kady Gulch, the risk for direct mortality of WCT due to livestock trampling is almost eliminated.	Fish habitat conditions would improve. With no cattle impacts, stream banks and riparian areas would likely recover from trampling and grazing/browsing damage
South Fork Quartz Creek	South Fork Quartz Creek was rated as PFC except in a low-gradient opening at the downstream end of the allotment boundary (T8N R4W Section 30). This reach was rated as FAR with no apparent trend, due to channel incision and low density of stream-side riparian vegetation along much of the reach.	By delaying livestock turnout until September 1 of each year on the South Fork of Quartz Creek and Kady Gulch, the risk for direct mortality of WCT due to livestock trampling is almost eliminated.	Fish habitat conditions would improve. With no cattle impacts, stream banks and riparian areas would likely recover from trampling and grazing/browsing damage
Clancy	A temporary electric cattle exclosure fence was installed around approximately 400 meters of upper Clancy Creek in 2008. Riparian conditions in this reach were rated at FAR in 2008 with and upward trend. The remainder of Clancy Creek on the HNF was rated as PFC.	The proposed action would reduce cattle impacts to two sensitive riparian areas within the Clancy Creek drainage (Kady and South Fork Quartz Creeks).	It is likely that closure of the allotment to cattle would not result in improvements in Clancy Creek sufficient to allow full attainment of beneficial uses.
Snowdrift Creek	Conditions along the upper reaches of Snowdrift Creek were rated Non-Functional (NF) (T7N R5W Section 11) and Functioning-at-Risk (FAR) with a downward trend (T7N R5W Section 10).	If conditions along Snowdrift Creek and riparian area persist under this alternative, “adaptive management” measures (such as off-site watering and riparian fencing) should be implemented in order to allow riparian recovery to functional-at-risk with an upward trend in the short-term, and PFC in the long-term.	With no cattle impacts, stream banks and riparian areas would likely recover from trampling and grazing/browsing damage
Wildlife			

The effects of livestock on threatened, endangered, sensitive, and management indicator species.	For further information see: Table 3-7 p. 36 Table 3-8 p. 37 Table 3-9 p. 38	The continued presence of cattle on the allotment generates ongoing impacts on some sensitive species even though these effects will be reduced by implementation of the new AMP. For further information see: Table 3-7 p. 36 Table 3-8 p. 37 Table 3-9 p. 38	For further information see: Table 3-7 p. 36 Table 3-8 p. 37 Table 3-9 p. 38
Soils			
Soil quality	If grazing continues in a manner consistent with the existing allotment management strategy, then it is predicted that soil resource conditions would remain the same as the existing condition	If adaptive management strategies are implemented in areas where monitoring indicates a need to improve rangeland resource conditions, then it is anticipated that soil conditions may improve more rapidly compared to existing conditions.	Termination of grazing provides the greatest potential to restore soils, at the most rapid rate.
Heritage			
Disturbance and damage to known and yet-to-be-discovered sites	Potential for direct and indirect impact to sites from vegetation removal and trampling by livestock.	Similar to Alt. 1, but with less potential for impacts to sites within riparian areas. Potential for impacts from construction of proposed range improvements.	No direct or indirect impacts to heritage resources from livestock or construction of range improvements.
Noxious Weeds			
Weed spread	Small-scale disturbance from livestock results in spread of weeds; cattle continue as vector for weed seeds.	Small-scale disturbance from livestock results in spread of weeds; cattle continue as vector for weed seeds.	No disturbance or introduction/movement of seed by livestock. Existing weeds continue to expand.
Weed treatment	Treatment would continue under forest weed treatment program	Same as Alt. 1	Same as Alt. 1
Recreation			
Recreation user conflicts	Minor; none documented	Similar to Alt. 1	None
Sensitive Plants			
Threatened, endangered species	No federally listed plant species are known to occur in the Helena National Forest	No federally listed plant species are known to occur in the Helena National Forest	No federally listed plant species are known to occur in the Helena National Forest
Sensitive species	The current situation has not affected known sensitive plant populations in an adverse manner.	Using adaptive management allows land managers to adjust to changes. This would be beneficial to sensitive plants to ensure that grazing	No sensitive plant populations have been found in the analysis area, It is possible that livestock grazing may impact individuals but

		<p>practices would not change in the Occidental Plateau area of the Clancy allotment.</p> <p>A beneficial effect to the overall health, productivity, and diversity of the grass and shrublands would occur from improving grazing practices, as well as sensitive areas such as riparian zones.</p>	<p>would not contribute toward a trend for federal listing or loss of viability</p>
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Identification of the Preferred Alternative

The preferred alternative for the Clancy allotment is Alternative 2. Alternative 2 was developed to meet the Purpose and Need for the project, taking into consideration resource needs identified during evaluations. Specifically, Alternative 2 reauthorizes grazing of the Clancy allotment, following development of a new allotment management plan that would incorporate these changes: include a maximum stocking rate that is lower than the 1988 AMP, and incorporate an adaptive management strategy that outlines how monitoring will be used to adjust management, so as to ensure that allotment objectives are met.

Chapter 3, Affected Environment and Environmental Consequences



Introduction

This chapter presents the relevant resource components of the existing environment – the base line environment. It describes the resources of the area that would be affected by the alternatives. This chapter also discloses the environmental effects of implementing the alternatives. These form the scientific and analytical basis for comparing the alternatives described in Chapter 2.

Some of the analyses disclosed in the chapter are complex and not easily quantified, which account for the slight variation among the resource section results due to the different modeling techniques and database queries. Many of the values presented are predictions and extrapolation from research and references, which accounts for variances that may occur across the resources. It cannot be assumed that the actual effects would occur exactly as presented in this chapter. Therefore, in reviewing this chapter, the information presented allows for a relative comparison among the alternatives.

This document hereby incorporates by reference the Resource Specialist Reports in the Project Record (40 CFR 1502.21). These reports contain the detailed data, assumptions, methodologies, analyses, conclusions, maps, references, and technical documentation that the resource specialists relied upon to reach conclusions in this document.

Range, Affected Environment

Introduction

Livestock grazing allotments in the Forest Service were officially set up with the establishment of the Forest Reserves and they are a component to rural ranching communities. Grazing on National Forest System lands is considered a multiple use of public lands and is integrated with all other resources.

The area in which the Clancy allotment now resides was one of the original allotment areas designated in the early days of the Helena National Forest, circa 1910. The Clancy allotment originally extended northward of its present location to include the present day Frohner and Quartz Creek-Rowe Gulch allotments. The boundary of the present day Clancy allotment is much the same as it was in 1976 when the Lump Gulch and Quartz Creek allotment areas were split and designated as separate allotments. The South Fork of Quartz Creek was separated from the Clancy allotment several times, then added back to the Clancy allotment most recently in the late 1970s.

The current AMP for the Clancy allotment was signed in 1988. The allotment boundary includes approximately 7,200 acres. This includes 5,800 acres of public land managed by both the Helena and Beaverhead-Deerlodge National Forests. There are also 1,400 acres of private land within the boundary of the Clancy allotment.

Little of the private land within the allotment boundary is separated by fence from the National Forest System land. Although the livestock are only permitted or authorized to graze on public land, it is the private landowner who is responsible for keeping livestock from grazing their private land. Some of the private land was authorized for grazing through a private land permit until approximately 2000. None of that private land is currently permitted, it is not proposed to be permitted and it is not used in determining suitability or capacity.

Utilization levels prescribed for the allotments determine when livestock must be moved between pastures and/or off National Forest System lands. These levels are currently prescribed by the Helena Forest Plan and outlined in the annual grazing season information given to the permittees. Actual use on the allotment for the last three seasons has been approximately 100 cow/calf pair with grazing seasons usually ending in late September (about 430 AUMs). Actual use has been less than authorized

due to persistent drought conditions and increased conifer encroachment in open grasslands and meadows resulting in reduced forage availability.

Methodology

Inspection data was gathered using ocular estimates, stubble height measurements and written narratives. The Helena National Forest Stage Stand protocols (see Appendix ?) were used to collect vegetative stage data in 1997 and 1998. The field data collected in the late 1990s on vegetation stage, suitability and utilization was not field validated or updated for this 2009 report. The GIS shop provided allotment boundary, pasture boundary, management area, utilization, vegetative stage and suitability intersected with project area. All of the above sources of information were used to generate statistics about livestock use and the range vegetation resource in the project area. Office records from the 1940s through the 2008 grazing season were consulted for information on authorized use, actual use, unauthorized use, permittee compliance, structural improvements and vegetation conditions.

Except for the stage stand data, quantitative methods for assessment of range resources impacts were generally not used in this analysis. To come to the results disclosed in the environmental effects section of this report, quantitative data from the late 1990s was added the qualitative and anecdotal information from the allotment files for the period from 1989 (last AMP) to 2008 and on the ground knowledge acquired during the 2008 grazing season, then professional judgment was added. Inspection notes in the allotment files do not provide enough quantitative information to generate an analysis of range condition in 2009 or what the trend since 2000 has been.

Existing Condition

Range surveys conducted in 1998 indicated that overall the Clancy allotment was in good to excellent condition with 75% being classified as stage 1 and 17% as stage 2 condition and the remaining 8% stage 3. Since then decreased cattle numbers should have allowed the condition to maintain or improve. Some of the stage 3 areas include: the headwalls of the Occidental Plateau, some small parks at the north end of the Occidental plateau which are close to shade and water and a portion of the pasture in the South Fork of Quartz Creek.

The allotment was not grazed for the years 2001-2005. It is a fair assumption that the rangeland vegetation improves with a five year rest from domestic livestock grazing. Inspection notes in the allotment files do not provide enough quantitative information to generate an analysis of range condition in 2009 or what the trend since 2000 has been.

In 2006 a permit was issued with the restriction that the South Fork of Quartz Creek pasture would not be used by the new permittee. That pasture would be used only on an as needed basis by the Clancy permittee or the permittee from the adjacent Quartz Creek/Rowe Gulch allotment. A portion of National Forest land on Clancy Creek has been protected with an electric fence. The fence was installed in 2007 on a trial basis to determine if it would be effective in protecting this portion of the creek, if it is found to be successful it will be implemented under the new AMP. The remainder of the drainage is in private ownership of the Montana Tunnels Mine and not under a private land permit.

Range improvements on this allotment consist of 5 water developments, and approximately 15 miles of fence. The fences on the allotment consist of allotment boundary fences between this allotment and the Quartz Creek Rowe Gulch allotment as well as between this allotment and allotments of the Deerlodge National Forest to the south and west. There are also internal pasture boundary fences and private boundary fences. Some of these fences are on the boundary with adjacent allotments and are not the responsibility of the Clancy permittee.

Affected Environment

Elevations vary from about 7800 feet on the Occidental Plateau to 5400 feet on the lower creek bottoms. The Occidental Plateau on the west side of the allotment is mostly grassland dominated by bunchgrasses. Park areas also exist in the southeast Mt. Washington area, the eastern area called

Locker Flats, and the north side of Kady Gulch in the southeast portion of the allotment. A series of smaller parks exist in the Quartz Creek drainage toward the north central allotment area. Steep, timbered hillsides dominate many of the draws, especially on the north facing aspects.

An allotment inventory was conducted in 1999 , using the Stage Stand protocol (USDA – FS 1993, Olsen), capability, stage stand (condition class), utilization, dominant vegetation, dominant species, colonization, invasive weed infestations and habitat type were collected on any primary, secondary, transitory primary and transitory secondary range. Habitat types were determined using a habitat type key depending on whether it was grassland/shrubland (Mueggler and Stewart 1980) or Forest types (Pfister, Bernard, Kovalchik, Arno and Presby 1983). Complete field data reports are in the project file.

Table 3-1 Habitat and Suitability by Acres (includes private lands)

Habitat Types	Acres Primary	Acres Secondary
Fesida/Agrspi (Idaho fescue/bluebunch wheatgrass)	80	0
Fessca/Fesida (Rough fescue/idaho fescue)	1929	45
Poapra spp (Bluegrasses)	11	0
Artrri/Fessca (Sagebrush/rough fescue)	78	7
Carexx (sedges)	3	46
Psemen/Agrspi (Douglas fir/bluebunch wheatgrass)	0	27
Psemen/Calrub (Douglas fir/pinegrass)	0	80
Psemen/Symalb (Douglas fir/snowberry)	0	89
Psemen/Fessca (Douglas fir/rough fescue)	23	65
Fessca/Agrspi (Rough fescue/bluebunch wheatgrass)	120	0
Salixx/Carexx (willow/sedge)	0	17
Fesida/Carfil (Idaho fescue/threadleaf sedge)	27	0
Carexx (sedges)	0	7
Total	2271	383

Vegetation Types and Ecological Stages

Vegetative conditions for uplands are described by stage. Vegetation stages are assigned using several criteria and were developed using data for the HNF and related to the vegetative desired conditions described in the HNF Foresr Plan. In general terms, stage 1 represents native grassland vegetation at a desirable condition where the objectives and trend are being maintained and a stage 4 is native vegetation most removed from the desired condition due to livestock grazing. An –I with a stage number indicates the site potential as been changed and introduced species are dominant.

The following table describes the vegetation stage of the primary range acres by pasture. The number in paranthesis is the acres of private land in that same stage, an addition to the non-parenthetical number.

Table 3-2 Vegetation Stage of Primary Range Acres by Pasture

Stage	Bluebird	Kady/Locker	MT Washington	Occidental	SF Quartz	Total	as % of total primary acres
Stage 1	534 (117)	111 (92)	123 (122)	277 (52)	279	1324 (383)	75% (77%)
Stage 1I	0 (5)	4	0	0	9 (2)	13 (7)	1% (1%)

Stage	Bluebird	Kady/Locker	MT Washington	Occidental	SF Quartz	Total	as % of total primary acres
Stage 2	22	211(2)	0	17	40 (9)	290 (11)	16% (2%)
Stage 2I	0	0 (34)	10 (19)	0	0	10 (53)	1% (11%)
Stage 3	0	36	0	0	48 (8)	84 (8)	5% (2%)
Stage 3I	0	53 (35)	0	0	0	53 (35)	3% (7%)
Stage 4	0	0	0	0	0	0	0
Total	556 (122)	415 (163)	133 (141)	294 (52)	376 (19)	1774 (497)	100% (100%)
Total all acres in pasture	804 (164)	427 (717)	1397 (265)	1021 (50)	2159 (197)	5808 (1392)	31% (36%)

The desired future condition of this allotment is to improve low seral rangelands (typically represented by stage 3 and 4) and upland grasslands and meadows by reducing bare soil and increasing native species and decrease the size and proportion of stage 3 or 3I and 4 or 4I areas so that 45-65% of the primary rangelands are in stage 1 or 1I, 25-40% are in stage 2 or 2I, 10-20% are in stage 3 or 3I, and 5-10% are in stage 4 or 4I.

Utilization

Allotment utilization data was collected in 1997. The allotment was stocked at 85% of the permitted numbers that particular year. Utilization on the primary range was inventoried mainly as moderate, while low and negligible utilization levels were recorded on the majority of the secondary range allotment.

Table 3-3 1997 Clancy Allotment Utilization Data

Utilization Levels	Primary Range Acres	as % of primary	Secondary Range Acres	as % of secondary	Total Acres	as % of total acres
Negligible (0-10%)	0	0%	86	24%	86	4%
Low (11-30%)	401	23%	151	41%	552	26%
Moderate (31-50%)	1173	66%	126	35%	1299	61%
High (51-70%)	103	6%	0	0%	103	5%
Very High (71-90%)	97	5%	0	0%	97	5%
Total Acres	1774	100%	363	100%	2137	100%

According to the allotment files, the acceptable utilization level for the entire allotment was 55% (by weight) for the grazing seasons 1989-1991. The acceptable utilization levels for the allotment from 1992-2008 are shown in the following table.

Table 3-4 1992 – 2008 Clancy Allotment Utilization Data

Dominant Vegetation	Early Pasture % Use	Mid/Late Pasture % Use	% Browse
Grass/grasslike/forb (uplands)	60%	40%	N/A
Willow/grass/grasslike and willow/conifer (riparian/forest)	70%	50%	50%

Improvements

An electric fence has been installed on a trial basis on a portion of Clancy Creek. If it is determined that this fence is effective it will become part of the new AMP.

Monitoring

The allowable use levels in the uplands, according to the Range Management Handbook (FSH 2209.21) are 50% in the early pasture and 45% in the late pastures. According to Helena Forest Plan standards for riparian areas, the maximum allowable use in the "early" pasture is 60% and in the "mid-late" pasture it is 40% and 50% allowable for browsing.

Range, Environmental Consequences

Introduction

Inspection data was gathered using ocular estimates, stubble height measurements and written narratives. The Helena National Forest Stage Stand protocols (Olsen, 1993) were used to collect vegetative stage data in 1997 and 1998. The field data collected in the late 1990s on vegetation stage, suitability and utilization was not field validated or updated for this 2009 report. The GIS shop provided allotment boundary, pasture boundary, management area, utilization, vegetative stage and suitability intersected with project area. All of the above sources of information were used to generate statistics about livestock use and the range vegetation resource in the project area. Office records from the 1940s through the 2008 grazing season were consulted for information on authorized use, actual use, unauthorized use, permittee compliance, structural improvements and vegetation conditions.

Except for the stage stand data, quantitative methods for assessment of range resources impacts were generally not used in this analysis. To come to the results disclosed in the environmental effects section of this report, quantitative data from the late 1990s, qualitative and anecdotal information from the allotment files for the period from 1989 (last AMP) to 2008, and on the ground knowledge acquired during the 2008 grazing season, along with professional judgment were used. Inspection notes in the allotment files do not provide enough quantitative information to generate an analysis of range condition in 2009 or what the trend since 2000 has been

Effects Common to All Alternatives

Trees continue to spread from forested sites into open parks, slowly reducing the amount of forage on grassland types (encroachment).

Effects Common to Alternatives 1 and 2 (Grazing Alternatives)

Plant diversity will increase under moderate grazing because grazing can even out the production of individual plant species, preventing any one species from dominating the landscape. By inhibiting the dominant species in a system, grazing promotes the establishment of secondary species (Comis 1999 and Link 2005). Grazing also increases habitat biodiversity by increasing the patchiness of the landscape. Ecotones are prolific in species richness and important wildlife habitat (Link 2005).

The accumulation of dead plant material would be beneficial by providing additional protection to the soil from erosion as well as leading to an increase in the organic matter in the soil. Grasses evolved with periodic removal of vegetation from various causes (including fire, wild ungulates, insects, etc) (Knapp, et al., 1986).

Maintenance of residual vegetation through livestock grazing is beneficial to rangeland condition. Grazing at appropriate levels lessens amounts of bare ground in areas where it is currently too prevalent, and increases the vigor of individual plants through proper utilization levels and better distribution of livestock across the allotment. Increasing litter in lacking areas ensures that adequate material is available for preventing erosion and trapping sediment in runoff and overland flow events (Molinar, Galt, Holechek 2001). Additionally, this material insulates plant crowns and over-wintering

buds, protects and covers soil, holds moisture in the ground and allows the plant to continue photosynthesis for carbohydrate production and storage. Greater carbohydrate storage results in more roots being produced by each plant. This increases the erosion defensibility and moisture-holding capacity of soils. It also provides a buffer to plants in times of stress such as drought. Less bare ground means more plants holding the soil in place while lessening the likelihood of invasion by noxious weeds.

Structural improvements on the allotments would be maintained. As an improvements usefulness diminished, it would be reconstructed or replaced as needed to maintain desired livestock distribution.

Cumulative Effects Common to Alternatives 1 and 2

In the absence of fire and harvesting, the Douglas-fir beetle continues to attack thick closed canopy timber stands and, in some cases, areas that were harvested 60 years ago. As a result of the timber dying there has been an increase of firewood cutters in this area. In some areas, travel plan violations have occurred and private boundary fences have been damaged by firewood cutters.

Alternative 1, No Action - Current Management

Direct and Indirect Effects

Maintenance of residual vegetation in the allotment would continue. The ecological stages of the primary range vegetation in the allotment would remain at current levels. These levels would be within objectives stated in the Divide landscape analysis.

Table 3-5 Ecological Stages of Range Vegetation

Primary Range	Current	Desired
stage 1	76%	45-65%
stage 2	17%	25-40%
stage 3	8%	10-20%
stage 4	0%	5-10%

The areas of historically concentrated use would remain areas of concern for other resources. Effects of this alternative on those resources are addressed in the fisheries, wildlife, soils and hydrology reports.

Under this proposal, improvement maintenance would continue on the existing fences as specified in the term grazing permits. However, due to the age of the existing fences, maintenance is becoming increasingly difficult and several would require reconstruction. Any additional improvements to the allotment would be addressed in future NEPA decisions.

Irreversible/Irretrievable Commitments

There are no irreversible commitments with this alternative. There would be some irretrievable commitments in historically heavy used areas but the grazing vegetation resources would eventually recover through the natural process if the distribution of livestock was changed through improved vegetation conditions as a result of wildfire or off-site water development.

Cumulative Effects

Other activities that may occur on the allotment: cabins/recreational homes are being built and will continue to be built on the numerous mining claims within the allotment. The Montana Tunnels mine will be expanded. Timber harvest may occur on the various private in holdings. These activities are most likely to affect the management of the allotment rather than the actual range resource. More activities in grazing areas generally can increase incidents such as gates being left open, fences being cut, off road travel. These are likely to result in time consuming inconveniences to the permittee. If not taken care of

these could lead to some resource damage if, for example, cattle were to go back into a pasture already grazed or were able to linger on the creeks of concern.

Alternative 2, Proposed Action

Direct and Indirect Effects

This alternative represents the actual use of the allotment over the last five to seven years but would allow for adaptive management. Grazing at levels 40 percent lower than current management would be beneficial to rangeland vegetation because residual vegetation would increase throughout the allotment. Implementing a deferred rotation grazing system would provide more of an opportunity for preferred plants and areas to store carbohydrates and set seed (Holechek 2004).

Over the long term, the ecological stages of the primary range vegetation in the allotment would improve from current levels. These levels would be within objectives stated in the Divide landscape analysis. Any increase in forage quantity or quality should also improve stock distribution, which lessens grazing pressure over the entire area (Holechek 2004).

If a structural improvement is found to be necessary on Snowdrift Creek to improve the riparian condition, stock distribution would not be negatively affected. The design of an off site water development or riparian fence will accommodate stock watering needs.

The areas of historically concentrated use would not remain areas of concern for other resources. Effects of this alternative on those resources are addressed in the fisheries, wildlife, soils and hydrology reports.

Irreversible/Irretrievable Commitments

There are not any irreversible commitments under this alternative. There would be some irretrievable commitments in historically heavy used areas. These areas would begin recover through natural process as the livestock grazing pressure is reduced and vegetation conditions improve.

Cumulative Effects

Other activities that may occur on the allotment: cabins/recreational homes are being built and will continue to be built on the numerous mining claims within the allotment. The Montana Tunnels mine will be expanded. Timber harvest may occur on the various private in holdings. These activities are most likely to affect the management of the allotment rather than the actual range resource. More activities in grazing areas generally can increase incidents such as gates being left open, fences being cut, off road travel. These are likely to result in time consuming inconveniences to the permittee. If not taken care of these could lead to some resource damage if, for example, cattle were to go back into a pasture already grazed or were able to linger on the creeks of concern. and Management activities contributing to cumulative effects in the analysis area include mining, road maintenance, timber harvest, road maintenance and recreation. These activities will have minimal combined effects to the analysis area. Past livestock grazing has had evident effects on plant diversity and vigor, especially in the isolated riparian area of the allotment, but adaptive management would allow for adjustments to move towards desired condition. Past harvest activities improved forage production for use by livestock for a short time by reducing the conifer overstory but are currently transitioning back to timber/shrubland type. The active mining claim within the allotment, have had no reported effect on livestock grazing. Roadside Hazard tree removal would not impact livestock grazing in the long term, but may affect livestock behavior while the tree removal is taking place.

Future forage production could be affected by drought, fire, timber harvest, conifer encroachment, road maintenance and noxious weeds. Forage production is considered annually and appropriate changes based on the conditions are incorporated into the Annual Operating Instructions. The implementation of adaptive management design criteria will determine annual livestock management based on allowable use standards.

Alternative 3, No Grazing

Under this alternative, no livestock would be authorized to graze the allotment.

Direct and Indirect Effects

This alternative would require the cancellation of all grazing permits upon implementation of the decision and resolution of any appeals. When grazing permits are cancelled to devote National Forest System Lands to another public purpose that precludes grazing, Forest Service Handbook 2209.13, Section 16.6, requires that the permit could not be terminated until two years after the notification of each affected permittee (36 CFR 222.4(a)(1)).

This would have a direct economic impact on the one permittees who depends on the permits as part of their ranching operation. If they did not have the allotment to graze, they would have to find alternative forage for their livestock with other private landowners. Private land leases are costing ranchers in upwards of \$22 to \$24/AUM. For example one rancher with 160 cow/calf pairs could pay \$16,500 to \$18,000 to pasture those livestock from June 16 to September 30 (750 AUM).

The elimination of grazing can have a long term effect on the environment and economy by forcing ranchers to produce more meat on private or leased land, thus increasing the potential need for fertilizers, supplement feeds and water for irrigation that requires more energy from fossil fuels and electricity than on rangelands (Journal of Range Management 27(3), May 1974)

The interior fences and existing water developments on the allotment would have to be removed because there would not be a permittee to assign the maintenance. The allotment boundary fence would stay in place due to being private boundary fence. Permittees would be reimbursed for their cost share of cooperative range improvements where they participated in the development (FSH 2209.13, Chapter 70).

With no vegetation treatments the range resource has the potential to eventually deteriorate. Removing domestic livestock from the grazing allotment would be beneficial to rangeland vegetation in the short term because residual vegetation would increase. The accumulation of dead plant material would initially be beneficial by providing additional protection to the soil from erosion as well as leading to an increase in the organic matter in the soil. Grasses evolved with periodic removal of vegetation from various causes (including fire, wild ungulates, insects, etc). After a certain point is reached however, the buildup of litter will begin to inhibit the growth of vegetation (Knapp, et al., 1986). This could cause a decrease in the productivity, palatability and overall plant health to many of the native and non-native species in some of these sites.

Irreversible/Irretrievable Commitments

There are not any irreversible commitments under this alternative. There would be some irretrievable commitments because of the potential loss of ranches that provided forage for livestock and wildlife. The land that they own could potentially become subdivisions or farm ground to provide income to sustain the families. All areas within the allotment boundary would receive permanent rest from livestock, and with the lack of management in the area upland primary forage areas would become decadent, non productive and susceptible to fire (Journal of Range Management 27(3), May 1974).

Cumulative Effects

Other activities that may occur on the allotment: cabins/recreational homes are being built and will continue to be built on the numerous mining claims within the allotment. The Montana Tunnels mine will be expanded. Timber harvest may occur on the various private in holdings. These activities are most likely to affect the management of the allotment rather than the actual range resource. More activities in grazing areas generally can increase incidents such as gates being left open, fences being cut, off road travel. These are likely to result in time consuming inconveniences to the permittee. If not taken care of these could lead to some resource damage if, for example, cattle were to go back into a pasture already grazed or were able to linger on the creeks of concern. Management activities contributing to

cumulative effects in the analysis area include mining, road side tree removal, timber harvest, road maintenance and recreation. These activities will have minimal combined effects to the analysis area. Interior improvements such as fences and water developments would have to be removed since maintenance would not be performed if there are no active permits. All areas within the allotment boundary would receive permanent rest from livestock, and with the lack of management in the area upland primary forage areas would become decadent non productive and susceptible to fire (Journal of Range Management 27(3), May 1974).

Conclusions and Forest Plan Consistency

Alternative 1, the current management, is consistent with the Forest Plan objectives and standards for range (1986 Helena National Forest Plan, page II/4, II/11, and II/22). All management areas on this allotment allow for livestock grazing and the current management authorizes less than the 1983 levels of grazing (1102 HM or 1455 AUMs). The alternative meets the long-term desired condition of the land area as designated in the Forest Plan and Divide landscape analysis (see Chapter 2).

Alternatives 2 the proposed action, is consistent with Forest Plan objectives, standards and desired future condition (1986 Helena National Forest Plan, pages II/4, II/11, and II/22). All management areas on this allotment allow for grazing to be included and the current management authorizes less than the 1983 levels of grazing (1102 HM or 1455 AUMs).

Alternative 3 no grazing, is consistent with the Forest Plan standards (1986 Helena National Forest Plan, page II/22). It would not meet the objective or desired future condition (1986 Helena National Forest Plan, pages II/4, II/11) once the allotment was closed. The alternative meets the long-term desired condition of the land area as designated in the Forest Plan and Divide Landscape Analysis (see Chapter 2).

Beaverhead Deerlodge National Forest: Record of Decision (ROD): ROD for FEIS, signed 1/14/09 by Tom Tidwell, Regional Forester – Selected Alternative is “Modified Alternative 6”. Modified Alternative 6 identifies 56 key watersheds for fish conservation and 15 restoration watersheds. It focuses restoration opportunities on aquatics and vegetative health. Identifies 802,000 acres as suitable for grazing (page 28).

ROD, Page 17, Revision Topic # 6: Livestock Grazing : The Revised Forest Plan prescribes interim standards for livestock grazing until specific long-term objectives, prescriptions, or allowable use levels have been designed through individual allotment management plans and site-specific NEPA decisions. It also strengthens forestwide standards for grazing and riparian management.

Hydrology, Affected Environment

Introduction

This report outlines water-resource issues related to the proposed Allotment Management Plan (AMP) for the Clancy allotment on the Helena Ranger District, Helena National Forest (HNF). The proposed Clancy allotment Management Plan (AMP) would change current livestock grazing practices on the allotment in order to reduce impacts to sensitive westslope cutthroat trout populations. The emphasis on protecting these fish populations would most likely also benefit water quality and riparian conditions in parts of the allotment. Proposed changes in grazing management on the allotment and maps of the area are located in the range portion of the Environmental Assessment (EA). The Fisheries Biological Evaluation (BE) outlines the proposed changes in light of stream conditions (pp 1-3).

The Clancy allotment covers parts of the headwaters Prickly Pear Creek, including Clancy Creek on the Helena National Forest (HNF), as well as much of Snowdrift Creek on the Deerlodge National Forest. Clancy Creek and Prickly Pear Creek were identified by the state as sediment-impaired. As part of the Lake Helena watershed planning effort, targets for sediment reductions were assigned. The water quality restoration plan has recommended an 81% reduction in anthropogenic sediment in Clancy

Creek. Livestock grazing in riparian areas was identified as a primary cause of elevated sediment levels in Clancy and Prickly Pear Creeks. While sediment reduction resulting from this plan revision would be relatively minor in terms of the existing sediment load, the effort would nonetheless help in achieving the state's target for sediment reduction.

The analysis area for direct and indirect effects, and cumulative effects to riparian condition, is the allotment area, located primarily in the Clancy Creek 6th-field watershed, and also including smaller portions of the Spring Creek and Cataract Creek 6th- field watersheds. The analysis area for cumulative effects to water quality is the entire Quartz Creek drainage, the entire Kady Gulch drainage, and the Clancy Creek drainage from the headwaters downstream to the confluence with Quartz Creek.

The information presented in this analysis comes directly from field examination of the project area conducted in 2008. PFC is a qualitative method of evaluating riparian conditions using standard Bureau of Land Management (BLM) PFC guidelines (Prichard, 1998).

Quantitative methods for assessment of water resources impacts were generally not used in this analysis. Sediment delivery from stream bank erosion is difficult to quantify. Similarly, bacteria, nutrients, and water temperature are difficult and expensive to effectively monitor. Forest staffing and budget constraints do not allow for this level of analysis at the allotment scale. For this report, a qualitative method of evaluating riparian conditions (PFC) was used.

Water Quality - Sediment

Sediment is generally the most common water-quality impairment in forest streams. Common sources include forest roads, stream bank erosion, recent wildfire and prescribed burning, past and present mining activities, and timber harvest activities. Heightened levels of sediment in a stream affect native fish viability and reproductive success, and make the water less suitable for domestic, recreational, agricultural, and industrial uses. Grazing allotment activities that generally cause increased sediment delivery to stream channels include cattle trampling along stream banks, springs, seeps, and in riparian areas. Cattle use of trails and old roadbeds often exposes soil to erosion from overland flow. Removal of riparian vegetation through browsing and trampling can affect stream channel and floodplain form and function, generally increasing the potential of flood waters to erode and transport sediment.

Sediment core data from 2003 were collected by HNF fisheries staff from likely trout spawning habitat in Clancy Creek roughly 1.8 miles downstream from the forest boundary (1.4 miles upstream from Quartz Creek). These data showed that the percentage of fine sediment (defined as percent of sampled substrate less than 6.4 mm in *b*-axis diameter) ranged from 15 to 39% (average 30.5%) at the sampled locations. The percentage of small fines (defined as percent of sampled substrate less than 0.85 mm in *b*-axis diameter) ranged from 3 to 14% (average 7.4%). These results suggest that substrate conditions in likely salmonid spawning sites approached levels that impair salmonid reproduction (30% and 10%, respectively—Magee et al. 1996).

Although peer-reviewed sediment research has identified approximate thresholds beyond which fine sediments harm salmonid reproduction, they are not necessarily appropriate standards for streams that have naturally higher levels of sediment. With this in mind, the Lake Helena TMDL designated target sediment levels based on a large dataset of sediment cores sampled from streams on the HNF. Using the TMDL guidance, targets for streams within the allotment should be the mean of all HNF cores from geologic settings similar to those of the Lake Helena basin (EPA, 2006). Thus, targets are 32.7% fines less than 6.4mm in *b*-axis diameter, and 10.0% fines less than 0.85mm in *b*-axis diameter. The average values measured in 2003 fell within these thresholds, and so this beneficial use was probably being fully met in the streams draining to this point. Core data were not collected from Quartz Creek or its tributaries, though conditions there were likely similar to those in Clancy Creek.

The relative scarcity of sediment data in the allotment area points to the need for additional monitoring to ensure compliance with the Lake Helena TMDL. Two specific methods should be used as part of the new AMP: channel bed substrate sampling (e.g. using McNeil sampler) and PFC riparian assessment. If

criteria proposed in the Lake Helena TMDL are not met, then adaptive management measures should be applied.

Sediment from Roads

A formal road sediment analysis was not completed for this analysis, as no road work is planned under the AMP revision, and all roads in the allotment area would remain open under all AMP alternatives. However, roads throughout the major drainages in this allotment contribute sediment to allotment-area streams. The Lake Helena TMDL attributes approximately 16% of the anthropogenic sediment load in Clancy Creek to unpaved roads (USEPA, 2006).

Sediment from Stream Bank Erosion

Stream bank erosion and trampling were surveyed in the 2008 PFC survey, and also evaluated in the Lake Helena TMDL (USEPA, 2006). The TMDL attributes approximately 63% of the anthropogenic sediment load in Clancy Creek to anthropogenic streambank erosion, which includes livestock trampling.

Sedimentation from Other Sources

Notable sources of sediment other than from roads and stream bank trampling/erosion were not identified within the allotment area.

Water Quality: Other

Within the allotment, other water quality impairments consist of nutrients, metals, and pathogens from livestock waste deposited in and adjacent to streams. In the analysis of Clancy Creek for the TMDL report, nutrients were not identified as an impairment. Metal contaminants identified in Clancy Creek were arsenic, cadmium, copper, lead, and zinc. The TMDL report suggested that anthropogenic streambank erosion (e.g. erosion caused by cattle grazing) accounts for between 3 and 6 percent of the metals load in the Lake Helena watershed. The targets for reduction in Clancy Creek range from 42 to 61 percent for the aforementioned metals. Reducing cattle impacts to stream banks will likely result in a minor reduction of metals input to streams in the allotment, although the proportion of metals coming from within the allotment have not been quantified. Stream temperatures were determined to be within an acceptable range in Clancy Creek. Pathogens were not evaluated, but also likely fall within acceptable limits.

Water Yield

Management for livestock grazing is not likely to measurably affect water yield in the watersheds included by this allotment.

Riparian Area Conditions

Physical riparian habitat conditions were observed along Snowdrift, Kady, South Fork Quartz, and Clancy Creeks within the allotment during July 2008. Standard Properly Functioning Condition (PFC) assessment methods were used (Prichard, 1998).

Conditions along the upper reaches of Snowdrift Creek were rated Non-Functional (NF) (T7N R5W Section 11) and Functioning-at-Risk (FAR) with a downward trend (T7N R5W Section 10). In both cases, impacts to vegetation from trampling, grazing, and browsing were documented to be the reasons for the ratings. Additionally, bank alteration was assessed in the upper section of Snowdrift Creek (T7N R5W Section 11) using the Region-1 Bank Alteration Protocol (Enk et al. 2005). The results showed an average of 41% bank alteration on this reach, which exceeds the HNF allowable use standards given the existing riparian conditions.

Kady Creek was rated as Properly Functioning (PFC) except for a reach approximately 850 meters in length (T7N R4W Section 6), which was rated as FAR with no apparent trend. Observed reasons for impairment were stream channel incision, lack of riparian shrubs, and low riparian species diversity.

South Fork Quartz Creek was rated as PFC except in a low-gradient opening at the downstream end of the allotment boundary (T8N R4W Section 30). This reach was rated as FAR with no apparent trend, due to channel incision and low density of stream-side riparian vegetation along much of the reach.

A temporary electric cattle enclosure fence was installed around approximately 400 meters of upper Clancy Creek in 2008. Although this fence was compromised at some point during 2008, riparian conditions in this reach were rated at FAR with an upward trend. The remainder of Clancy Creek on the HNF was rated as PFC.

Hydrology, Environmental Consequences

Effects Common to All Alternatives

Road use and sediment delivery to stream channels from forest roads are not likely to change measurably among any of the alternatives.

Effects Common to All Action Alternatives

Road use and sediment delivery to stream channels from forest roads are not likely to change measurably among any of the action alternatives.

Alternative 1, No Action - Current Management

Direct and Indirect Effects

The no-action alternative would reauthorize 280 cow/calf pairs from June 16 to September 30. Assuming full use under this alternative, direct and indirect effects to water resources within and downstream of the allotment boundary will continue or worsen as described above in "Affected Environment."

Irreversible/Irretrievable Commitments

An irreversible commitment represents a total loss of a resource, which cannot be replaced. An irretrievable commitment represents a temporary loss of a resource, which can be replaced over time. An irretrievable commitment in continuing the status quo management plan is the reduction in stream channel stability and in riparian productivity/vigor, and all of their associated benefits (in the reaches identified as FAR). Presumably, these areas would recover to PFC over time if cattle were permanently removed. See the fisheries and wildlife specialist reports for details on how those resources are affected by loss of riparian productivity and vigor.

Cumulative Effects

In addition to the impacts of grazing within the allotment at current use levels, several past and present federal and non-federal activities have affected and continue to affect water quality and yield, and riparian health and vigor in the cumulative effects analysis area. Existing roads contribute an unquantified volume of sediment to stream channels. Past timber harvest has likely caused temporary increases in water yield and sediment delivery in the past, though these effects generally attenuate over time. Small-scale mining has in the past contributed sediment to stream channels in the watershed. Past pulses of elevated sediment (e.g. from timber harvest or mining) can remain in stream channels (banks and bed) for many years following deposition. Continued grazing in riparian areas and cattle trailing along streams would continue to contribute elevated sediment levels to streams in the watershed. In the absence of other reductions to sediment delivery in the watershed, allotment streams would continue to receive elevated levels of sediment. Riparian fencing installed along part of Clancy Creek by the HNF should allow the riparian areas along this stream to continue to recover to PFC over the next several years, provided the fence is adequately maintained. Watershed improvement projects will likely continue to be implemented periodically in the future within the cumulative effects analysis area.

Reasonably foreseeable federal and non-federal activities that could affect water quality and yield and riparian health and vigor in the cumulative effects analysis area include future timber harvest, small-scale mining, continued livestock impacts, roads, and fire. Foreseeable timber harvest activities in the analysis area on the national forest are not likely to substantially affect water quality or riparian area viability, given compliance with the SMZ law and strict adherence to forestry BMPs. Future mining activities may in the future contribute to riparian degradation and water quality impairment within the allotment. The livestock impacts outlined in the “Affected Environment” section of this report will continue under this alternative. While use of this area for grazing does result in additional sediment delivery to tributaries of a sediment-impaired stream (Clancy Creek), the amount of sediment from this management activity would likely continue to be a relatively minor component of the overall impairment in this stream.

Alternative 2, Proposed Action

Direct and Indirect Effects

The proposed action would reauthorize a maximum of 160 cow/calf pairs (or the equivalent animal use months) in the allotment from June 16 to September 30. Use in the past two years has been within this threshold. This change in itself would not likely result in any meaningful improvement in riparian or stream-bank conditions in the allotment as described in the “Affected Environment” section. However, other changes included in the proposed action would likely reduce livestock impacts to streams and riparian areas. Specifically, cattle will have access to Kady Gulch and South Fork Quartz Creek only after August 31, in order to minimize impacts to cutthroat trout redds and alevins. The exclusion of cattle from these sensitive areas until September should somewhat reduce livestock trampling and associated sediment delivery to these streams. Whether this restriction will result in improving riparian conditions in those reaches identified as FAR is less certain. Furthermore, this measure may result in increasing pressure on Snowdrift Creek, which has already been identified as impaired. This could result in greater sediment delivery to a 303(d)-listed stream (Cataract Creek) from Forest Service lands. The proposed provision for “adaptive management” should include monitoring of stream bank and riparian conditions in along Kady, South Fork Quartz, and Snowdrift Creeks at least every three years, and taking corrective measures such as riparian fences or off-site water developments if conditions are not found to be improving.

Irreversible/Irretrievable Commitments

An irretrievable commitment under this alternative will likely continue to be the reduction in stream channel stability and in riparian productivity/vigor, and all of their associated benefits (in the reaches identified as NF or FAR). Presumably, these areas would recover to PFC over time if cattle were permanently removed. See the fisheries and wildlife specialist reports for details on how those resources are affected by loss of riparian productivity and vigor.

Cumulative Effects

The cumulative effects of past, present and reasonably foreseeable actions on water resources in the analysis area are reviewed above under “Alternative 1.” The difference between this alternative and Alternative 1 is that cumulative effects on water resources in the analysis area would be incrementally reduced due to the proposed changes in permitted animal numbers and access periods to sensitive riparian areas.

Alternative 3, No Grazing

Direct and Indirect Effects

With no cattle impacts, stream banks and riparian areas would likely recover from trampling and grazing/browsing damage. This would result in the recovery of riparian conditions to PFC, and the reduction of sediment delivery to stream channels to natural conditions over the long term.

Irreversible/Irretrievable Commitments

There are no irreversible or irretrievable commitments to water resources under this alternative.

Cumulative Effects

The cumulative effects of past, present and reasonably foreseeable actions on water resources in the analysis area are reviewed above under "Alternative 1." Under this alternative, cumulative effects to water resources in the analysis area would be reduced incrementally due to the elimination of cattle from the allotment.

Conclusions and Forest Plan Consistency

Alternative 1

Currently, state water quality laws requiring full attainment of beneficial uses in allotment streams are not being met. Thus, under this alternative, full attainment of beneficial uses would still not be met. However, it is unlikely that even closing the allotment entirely would result in improvements in Clancy Creek sufficient to allow full attainment of beneficial uses. Nonetheless, management under this alternative would most likely not meet the state requirement that "all reasonable land, soil and water conservation practices have been applied" (ARM 17.30.602) to minimize pollution. Furthermore, this alternative would not meet the Forest Plan standard requiring that off-stream water developments be emphasized in order to prevent damage to riparian areas (HNF Forest Plan, p II-35). Moreover, some riparian areas would remain in non-functioning status, while others would probably continue as functioning-at-risk with a downward trend in the short term, and become non-functional in the long term, assuming full authorized use.

Alternative 2

As stated in the previous paragraph, it is likely that closure of the allotment to cattle would not result in improvements in Clancy Creek sufficient to allow full attainment of beneficial uses. However, the proposed action would reduce cattle impacts to two sensitive riparian areas within the Clancy Creek drainage (Kady and South Fork Quartz Creeks). This would likely meet the state requirement that "all reasonable land, soil and water conservation practices have been applied" (ARM 17.30.602) to minimize pollution in the Clancy Creek drainage. If conditions along Snowdrift Creek and riparian area persist under this alternative, "adaptive management" measures (such as off-site watering and riparian fencing) should be implemented in order to allow riparian recovery to functional-at-risk with an upward trend in the short term and PFC in the long term.

Monitoring of riparian and stream-bank conditions in the allotment should occur after one year of use following implementation of the proposed developments to ensure effectiveness of the new measures, and thereafter every three years to ensure that the proposed measures were effective in reducing cattle damage in riparian areas and along stream banks. If non-functional and functioning-at-risk areas do not begin to show improvement after three years following installation of improvements, then additional management measures should be implemented to facilitate recovery.

Alternative 3

Under this alternative, state water quality laws requiring full attainment of beneficial uses in allotment streams would be met. It is also likely that management under this alternative would lead to full compliance with water-resource-related Forest Plan standards after a period of recovery following removal of cattle.

Fisheries, Affected Environment

Introduction

The Clancy livestock grazing allotment is administered by the Helena National Forest and is located in the Prickly Pear drainage within the Upper Missouri 4th Code Hydrologic Unit. Fishery streams within the allotment include Clancy Creek, Kady Gulch, Quartz Creek, South Fork of Quartz Creek, and Snowdrift Creek.

This section presents existing conditions and trends in the fisheries resource within the Clancy allotment area. The information is organized under two subsections by subwatershed (4th field HUC): *fish populations* and *fish habitat*. The first section presents information about the status and distribution of fish populations inhabiting area streams. The second subsection provides an overview of habitat conditions including land-use activities influencing trends in stream habitat conditions.

Fish Populations

Westslope cutthroat trout (WCT) are one of several distinct interior subspecies of cutthroat trout (Behnke 1992 pgs 2-5). Within the project area WCT are known to be present in Quartz Creek, the South Fork of Quartz Creek, Kady Gulch, and the extreme headwaters of Clancy Creek. All of these streams are within the Upper Missouri 4th Code Hydrologic Unit.

Quartz Creek

Quartz Creek is a tributary to Clancy Creek and is within the upper Missouri River 4th code hydrologic unit. Portions of Quartz Creek and the South Fork of Quartz Creek support genetically pure WCT which have been designated as a “conservation population”. Fisheries surveys by various FS and FWP fisheries crews have determined that WCT occupy less than three miles of habitat on lands administered by the Helena Forest in the South Fork of Quartz Creek and Quartz Creek. Maps delineating WCT distribution are located in Helena Forest Fishery Files.

Brook trout are currently restricted in their upstream distribution in the South Fork of Quartz Creek by a natural barrier and culvert barrier almost in the exact same location. Hence, the WCT population above the culvert barrier does not have to compete with the non-native brook trout. A 600 foot reach sampled in the area above the barrier found 26 WCT 4-6 inches in length and 27 WCT 1-3 inches in length. Brook trout are the only species found in the North Fork of Quartz despite a barrier to fish movement within a ¼ of its confluence with the South Fork. Relative abundance of WCT on national forest land in the South Fork as it relates to habitat site potential was judged to be somewhat below potential due mostly to inherently low productivity of the stream, high sediment due to the influence of existing roads and to some degree livestock grazing practices and direct mortality that may be occurring associated with the grazing. WCT abundance is low throughout the drainage and very low below the barrier culvert. Below the barrier on the South Fork a 600 foot reach yielded 67 brook trout and six WCT. The WCT were all 4-6 inches in length; no young of the year or fry were found. The extent of production from spawning on federally administered lands was quantified in 2005 for the South Fork of Quartz Creek. No WCT reproduction was identified below the barrier culvert. Spawning was found to be occurring in the South Fork of Quartz Creek and an unnamed tributary to the South Fork of Quartz Creek upstream of the culvert barrier. Additional detail on locations and magnitude of spawning is within Helena Forest fishery files.

Based on relative fish abundance, lack of young age WCT below the culvert barrier, and lack of WCT redds below the culvert barrier, it is almost a certainty that production on federal lands upstream of the existing barrier on the South Fork of Quartz Creek represents most if not all of the WCT production for the Quartz Creek WCT population.

Four separate types of population risk variables identified by Rieman et al. (1993) were individually assessed for the Quartz Creek WCT population: isolation, population size, temporal variability (<10 km connected habitat), and population productivity (fluctuating around an equilibrium below potential due to habitat quality less than potential, especially below the forest boundary). With the WCT population being isolated, population numbers being low, limited connectivity with one unnamed tributary and some habitat degradation from sediment, the extinction risk for the South Quartz Creek population is rated as moderate to high. The presence of both a natural barrier and an artificial barrier (culvert) on federal land serves to prevent upstream invasion of a portion of the South Fork of Quartz Creek by non-native fish

species. The lack of competition and predatory influences from non-native brook trout favors the continued short-term survival of the South Fork Quartz Creek WCT population.

Table 3-6 Determination of Effects on Sensitive Fish Species

Sensitive Fish Species	Determination of Effects
Westslope Cutthroat Trout	MI for Quartz Creek and Kady Gulch drainages
Westslope Cutthroat Trout	MI for Clancy Creek with a likely loss of viability for the local population due to cumulative effects, risk of stochastic events, and possibly genetic inbreeding but the loss of viability will not result in a trend toward listing

MI = May Impact Individuals or habitat but not result in a trend toward federal listing or loss of viability

Kady Gulch

Earlier the WCT in this stream and Clancy Creek were considered to be part of a single connected population. However, based on sampling in recent years, which demonstrated the isolated and limited nature of the populations, it is now reasonable to consider Kady Gulch a separate isolated population (Nelson 2008). Sampling efforts in 2007 found lower numbers of WCT numbers compared to 2006 (Harper 2007). However, sampling farther downstream MDFWP biologist Lee Nelson found over 20 WCT (Nelson 2007). Based on the 2007 findings the risk of extinction (using Rieman et al 1993) for WCT is still considered high to extreme for Kady Gulch due to low numbers of adults, isolated nature of the population, lack of connectivity, moderately impacted habitat conditions, and especially the presence of brook trout both within and downstream of the national forest. Earlier information on fish abundance and distributions was gathered by Westech in 2003 and is included in the Westech (2004) Report. Earlier work by the Montana Department of Fish Wildlife and Parks (Spoon 2004) and Nelson also documented the sparse abundance of WCT in Clancy Creek. Maps delineating WCT distribution are located in Helena Forest Fishery Files.

Clancy Creek

Earlier the WCT in this stream and Kady Gulch were considered to be part of a single connected population. However, based on sampling in recent years demonstrating the isolated and limited nature of the populations, it is now reasonable to consider WCT in Clancy Creek a separate isolated population (Nelson 2008). Genetic evaluation of the WCT indicates that they are genetically pure WCT and are consequently considered a conservation population by the Montana Department of Fish Wildlife and Parks. Risk of extinction of the WCT population in Clancy Creek is now rated as extreme using Rieman’s et al. (1993) approach given how much the distribution of WCT has diminished in the last 10 years. Sampling in 1997 by Forest Service fishery personnel found that WCT were relatively abundant upstream of the Kady Gulch confluence. The WCT population is currently limited to less than ½ mile of stream above discharge from an old mining site based on sampling conducted on lands administered by the Helena Forest in 2007. Only a few WCT could be found. Based on the 2007 information Numbers of WCT are likely extremely low with adult numbers well below 50 in Clancy Creek upstream of the Kady Gulch confluence. It seems likely that the adit discharge is currently preventing further upstream invasion by brook trout. In the reaches below the adit discharge no WCT could be found in the most recent sampling and the stream now appears to support primarily brook trout down to the confluence with Quartz Creek. Earlier sampling also documented the presence of a few brown trout on private portions of Clancy creek below the Quartz Creek confluence. Additional detail on fish abundance and distributions was gathered by Westech in 2003 and is included in Westech (2004). Earlier work by the Montana Department of Fish, Wildlife, and Parks (Spoon 2004) also documented the sparse abundance of WCT in Clancy Creek.

Snowdrift Creek

Snowdrift Creek supports a cutthroat trout fishery with no brook trout present, but the upper extent of distribution in Snowdrift Creek has not been established. Genetic work completed in the 1980s showed that the cutthroat trout in Cataract Creek are pure Yellowstone cutthroat trout. Snowdrift is connected to

Cataract Creek with no barriers in the lower reaches so it is likely that Yellowstone cutthroat trout are the species present.

Fish Habitat

Quartz Creek

Roads are present throughout the drainage with substantial levels of sediment delivery in some locations due to the proximity of the road to the stream. Culverts that are partial to complete barriers to fish movements are present on Quartz Creek, the South Fork of Quartz Creek, and the North Fork of Quartz Creek. Natural barriers to fish movements are also present in two locations in the South Fork of Quartz Creek and one location (outside the present project area) in the North Fork of Quartz Creek. Additional information on the location and type of barrier are available in Helena Forest Fishery Project Files.

Beaver ponds were present in Quartz Creek near the confluence of the North fork of Quartz Creek were documented by Forest fishery personnel in the late 1980s (Walch 1987 and 1989). Currently beaver dams are no longer present in this area. The loss of beaver from the Quartz Creek drainage has currently reduced the potential for good over-winter rearing habitat. There is little beaver influence in the South Fork rather it is mostly located at or just above the confluence of the North Fork of Quartz Creek. No active beaver dams were present in 2008.

Some mining prospecting has occurred sporadically throughout the drainage with effects varying from minor to severe in some locations. Livestock grazing impacts are mostly limited to crossing areas and in the beaver influenced areas where livestock have easy access to the stream. In these locations some bank trampling has occurred. In general the nature of the stream channel (other than the reach influenced by beaver) is such that there is little bank trampling effects from livestock.

Additionally, there is variety of activities occurring on non-federal lands that are affecting fish habitat including water diversion occurring on private land, road sediment delivery, loss of beaver, salvage logging, culvert barriers to fish movements, and livestock grazing.

Kady Gulch

Mostly qualitative assessments of fish habitat have been completed in recent years. On lands administered by the Helena Forest habitat condition is not highly deteriorated, but poor road conditions with sediment delivery have likely had some negative impacts on salmonid egg survival. Core sample information collected from spawning substrates in 1989 found fines sediments smaller than ¼ inch diameter made up 40% by weight. Additionally, there is some impact from livestock grazing in a few locations where livestock have easy access to the channel. Fords are also present that provide access to dispersed camp areas and firewood cutting. There has also been firewood cutting near stream channel where trees that would have provided woody debris to the stream have been removed. Mining exploration has also had some impact in this drainage. Below the Forest there are substantial grazing impacts where the habitat is more susceptible to bank trampling effects. More detailed information regarding habitat conditions is included in Westech (2004).

Clancy Creek

Only qualitative assessments of fish habitat have been completed by Forest Fishery personnel. The stream is heavily altered throughout most of its length on private lands due to past mining activities as well as road location. Livestock grazing is also occurring and resulting increased levels of bank trampling and reduction in streamside shrub cover in some locations where cattle have easy access to the stream bank. Sedimentation of stream gravels is high and is likely related primarily to delivery of sediment from existing roads and past mining activities. Additional information regarding habitat conditions is included in Westech (2004).

Only a very short reach of Clancy Creek is federally administered and much of stream habitat is not highly susceptible to being damaged by livestock. The reach that is highly susceptible to being

damaged by livestock has suffered substantial bank disturbance in the past; estimated at 40%. This reach is now protected by an electric fence installed in 2008.

Snowdrift Creek

Documentation shows bank trampling effects in the upper reaches of Snowdrift Creek with bank disturbance levels of 30-40%. Assuming that Yellowstone cutthroat trout are present in the portion of Snowdrift Creek within the allotment then there is likely some trampling of Yellowstone cutthroat trout eggs and fry with those levels of streambank and likely in-channel disturbance. Consequently, some direct mortality from trampling of eggs and indirect mortality from sediment effects is likely occurring; again assuming Yellowstone cutthroat trout are present in the upper reaches. It is unlikely that viability of any fish species present in Snowdrift Creek would be at risk as the portion of Snowdrift Creek within the allotment is small in relation to portions of Snowdrift Creek downstream of the allotment.

Fish Habitat Indices Relative to Allotment Management Planning:

(1) PFC

The Helena Forest uses the *proper functioning condition* (PFC) concept (Pritchard et al 1998) as a basis to help characterize and evaluate stream-riparian conditions in livestock allotments. The results of PFC analyses are also used to determine stream corridor restoration needs and priorities. PFC denotes both an assessment tool and an on-the-ground condition rating of riparian habitats. Three functional ratings are described in Pritchard et al (1998): *proper functioning condition* (PFC), *functional—at risk* (FAR), and *nonfunctional* (NF).

The following are definitions of the three functional ratings as set forth in TR-1737-15 (Pritchard et al. 1998, pgs 9-20):

Proper Functioning Condition – Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to:

- Dissipate stream energy associated with high flows.
- Filter sediment, capture bedload, and aid in floodplain development.
- Improve floodwater retention and groundwater storage.
- Develop root masses for stable streambanks against cutting action.
- Develop diverse ponding and channel characteristics to provide habitat and water depth, duration and temperature needed for fish production and other uses.
- Support greater biodiversity.

Functional at Risk (FAR) – Riparian-wetland areas in functional condition, but at least one of its attributes/processes gives it a high probability of degradation with a relatively high flow event.

Nonfunctional (NF) -- Riparian-wetland areas clearly lack the elements listed in the PFC definition (above).

Riparian Area Conditions

Physical riparian habitat conditions were observed along Snowdrift, Kady, South Fork Quartz, and Clancy Creeks within the allotment during July 2008. Standard Properly Functioning Condition (PFC) assessment methods were used (Prichard, 1998).

Conditions along the upper reaches of Snowdrift Creek were rated Non-Functional (NF) (T7N R5W Section 11) and Functioning-at-Risk (FAR) with a downward trend (T7N R5W Section 10). In both cases, impacts to vegetation from trampling, grazing, and browsing were documented to be the reasons for the ratings. Additionally, bank alteration was assessed in the upper section of Snowdrift Creek (T7N R5W Section 11) using the Region-1 Bank Alteration Protocol (Enk, et al 2005). The results showed an average of 41% bank alteration on this reach, which exceeds the HNF allowable use standards given the existing riparian conditions.

Kady Creek was rated as Properly Functioning (PFC) except for a reach approximately 850 meters in length (T7N R4W Section 6), which was rated as FAR with no apparent trend. Observed reasons for impairment were stream channel incision, lack of riparian shrubs, and low riparian species diversity.

South Fork Quartz Creek was rated as PFC except in a low-gradient opening at the downstream end of the allotment boundary (T8N R4W Section 30). This reach was rated as FAR with no apparent trend, due to channel incision and low density of stream-side riparian vegetation along much of the reach.

An electric cattle enclosure fence was installed around approximately 400 meters of upper Clancy Creek in 2008. Although this fence was compromised at some point during 2008, riparian conditions in this reach were rated at FAR with an upward trend. The remainder of Clancy Creek on the HNF was rated as PFC.

(2) Fine sediment by depth in spawning gravels

To estimate cumulative effects from past and ongoing land use activities in fishbearing streams and help monitor trends in fish habitat quality in response to foreseeable future disturbance activities in a drainage, fines by depth in spawning gravels are assessed. Although the effects of this project can not be precisely measured or predicted in the context of past and ongoing disturbances, it is commonly accepted in watershed practice that the channel is the ultimate integrator of land-use activities and natural processes in a given drainage. As pointed out under the background discussion, the common denominator from various land-use actions affecting fish habitat is excess sediment beyond natural background levels in the streambed (Meehan 1991, pg 5-6). Therefore, both baseline conditions and the cumulative effect of proposed actions are best measured in the streambed where sediment accrues in critical reaches. Fines by depth in spawning gravels are the accepted indicator of fish habitat change on the Helena National Forest accounting for all disturbances in a drainage above a critical reach area.

Fisheries biologists on the Helena National Forest identify critical reaches for sampling fine sediments in spawning habitat using McNeil substrate core sampling methodologies (Platts et al. 1983, pgs 17-20). Substrate core sampling is seen as a practical means to assess existing (baseline) conditions of spawning substrates as a function of cumulative effects in fishbearing tributaries and to help monitor trends in fish habitat quality to future disturbance activities in a drainage. Critical reaches reflect changes in fish habitat from altered sediment yields in a specific area of interest (Stowell et al. 1983).

Sediment core data from 2003 were collected by HNF fisheries staff from likely trout spawning habitat in Clancy Creek roughly 1.8 miles downstream from the forest boundary (1.4 miles upstream from Quartz Creek). These data showed that the percentage of fine sediment (defined as percent of sampled substrate less than 6.4 mm in *b*-axis diameter) ranged from 15 to 39% (average 30.5%) at the sampled locations. The percentage of small fines (defined as percent of sampled substrate less than 0.85 mm in *b*-axis diameter) ranged from 3 to 14% (average 7.4%). These results suggest that substrate conditions in likely salmonid spawning sites approached levels that impair salmonid reproduction (30% and 10%, respectively—Magee et al. 1996).

Fisheries, Environmental Consequences

Effects Common to All Alternatives

There would be the risk of unauthorized livestock grazing from adjacent private lands and allotments depending on the level of fence monitoring and maintenance on the allotment perimeter and FS/private boundaries. As a consequence, there is likely to be some risk for domestic livestock disturbance on reaches of the stream network within the bounds of the Clancy allotment. This disturbance, however, is likely to be low and unpredictable in space and time as a function of climatic factors, funding availability, and measures undertaken by adjacent private landowners to control/contain their cattle from unauthorized use on federal land.

Effects Common to Alternatives 1 and 2

In addition to the risk of unauthorized livestock grazing, there would be continued pressure on stream corridors from livestock use. However, the degree of livestock influence on stream-riparian functioning conditions would vary by alternative due to changes in the control over livestock use in riparian corridors. There is some potential for continued direct mortality to brook trout eggs and fry from livestock when the grazing season extends into September. Additionally there is some risk for direct mortality of westslope cutthroat trout but risk varies substantially between alternatives.

Alternative 1, No Action -Current Management

Direct and Indirect Effects

Under the no action alternative; the present allotment management plan there would be continued adverse effects from domestic livestock grazing to fish and fish habitat in Kady Gulch, Clancy Creek, and the Quartz Creek drainage. Fish species most at risk are westslope cutthroat trout. Risk for mortality of westslope cutthroat trout due to livestock trampling of redds would continue as livestock would be present in pastures that include streams supporting spawning WCT while eggs and fry are in stream gravels (Kady Gulch and possibly Clancy Creek). Fisheries research suggests that mortality of eggs and fry can occur to varying degrees at times during salmonid egg incubation if the gravels where the eggs are located are stepped on. The mortality of any WCT would give brook trout somewhat of a competitive edge over WCT in Kady Gulch and possibly Clancy Creek as brook trout spawn after livestock are removed from the allotment and thus the eggs of brook trout do not suffer a similar risk for trampling by livestock. Consequently, survival of brook trout can be higher and then, when combined with the tendency for brook trout to prey and compete with cutthroat trout in some instances, the WCT are likely to be at a disadvantage. Additionally, there would be a continuation of bank trampling at selected locations on all three fishery streams which would continue contributing sediment to streams that already have substantial levels of fine sediment in the gravels used for reproduction.

Irreversible/Irretrievable Commitments

Irreversible and irretrievable commitments are defined as the permanent loss of future options and the temporary loss of a resource respectively. There is no irreversible commitment of fishery resources as a function of current livestock grazing management. There are some irretrievable commitments of fishery related resources in that there will be continued loss of individual fish and continued loss of fish habitat in some locations on some streams due to continued livestock grazing as discussed in the environmental consequences for Alternative 1.

Cumulative Effects

Effects to westslope cutthroat trout (WCT) and WCT habitat from past and ongoing activities in the cumulative effects analysis area for this project are accounted for in the biological evaluation for westslope cutthroat trout (Walch 2008) - including effects from continuation of the existing allotment management plan. These cumulative effects would continue at the same level of magnitude on federal lands and possibly get worse due to effects from mine expansion in the Clancy Creek drainage and continued slow degradation of riparian habitats over time. On the other hand some required mitigation is being implemented in the Clancy Creek drainage by the mining company with completion of a riparian fence on non-federal lands. As discussed for direct and indirect effects above, the cumulative effects to fishes other than WCT are considered to be equal to or less than what is discussed in the Walch (2008) biological evaluation for WCT.

The dominance of brook trout in combination with the direct, indirect, and cumulative effects from various activities throughout the cumulative effects analysis area is projected to contribute toward loss of viability of the WCT population in the Clancy Creek and Kady Gulch drainage. For other fish species there would be no loss of viability in any streams currently supporting fish- although riparian habitat would continue to be impacted at current levels.

Alternative 2 – Proposed Action

Direct and Indirect Effects

Effects on WCT by the selected federal action are projected to be influenced by the degree to which livestock are currently affecting streamside cover and stream morphology; especially streambank structure and sediment levels in spawning and rearing habitats. Additionally, there is risk for direct mortality of WCT associated with trampling of eggs and fry while they are still within spawning gravels.

By delaying livestock turnout until September 1 of each year on the South Fork of Quartz Creek and Kady Gulch, the risk for direct mortality of WCT due to livestock trampling is almost eliminated. The majority of WCT fry should have emerged from stream gravels by mid to late August within the project area. In combination with efforts to reduce brook trout influence in the Kady Gulch population there should be some increase in WCT numbers over the next few years. In the South Fork of Quartz there should also be somewhat higher numbers of WCT surviving as risk of egg trampling should be greatly reduced.

Importantly, livestock still will access the portion of Clancy Creek that support WCT while eggs and fry are still within the gravels. However, installation of the electric fence (2008) should eliminate risk of redd trampling in areas susceptible to being used heavily by livestock. Consequently survival of WCT should be improved over what has been occurring. Even with the extensive effort to protect WCT in the Clancy drainage the population may still go extinct due to the extremely low numbers and very limited distribution in relation to cumulative effects. However, the livestock grazing on federal lands will not be contributing significantly to this loss of WCT populations in the project area.

Irreversible/Irretrievable Commitments

There is no irreversible commitment of fishery resources as a function of current livestock grazing management. As with alternative 1 there are some irretrievable commitments related to fisheries due to continued negative effects to fish habitat on some streams in some locations, but the commitments are less than what occurs with alternative 1, especially on South Quartz Creek and Kady Gulch.

Cumulative Effects

Effects on westslope cutthroat trout (WCT) and WCT habitat from past and ongoing activities in the cumulative effects analysis area for this project are accounted for in the biological evaluation for westslope cutthroat trout (Walch 2008). As discussed earlier for direct and indirect effects above, the cumulative effects to fishes other than WCT are considered to be equal to or less than what is discussed in the BE for WCT and overall the effects to species other than WCT are not considered to be significant; from the perspective that loss of viability would occur. As pointed out in the BE (Walch 2008), loss of viability of WCT in Clancy Creek is projected due to a variety of reasons including cumulative effects. For Kady Gulch the situation is similar to Clancy Creek although not as bad. Through the reductions in egg mortality and improved riparian habitat due to changes in the grazing allotment along with active control of brook trout, the viability of westslope cutthroat trout in Kady Gulch should be maintained over a moderate time frame (10-25 years). Some negative effects to WCT in South Quartz Creek would continue due to sediment delivery from roads, but the risk for loss of viability of WCT is less than for either Clancy or Kady Gulch due to absence of brook trout in the key WCT reach on the south Fork of Quartz Creek.

Regarding the overall risk for future negative and positive effects that are foreseeable from all land ownerships throughout the cumulative effects analysis area, in relation to the discussions above, it is concluded that the that proposed alternative for the Clancy livestock allotment would result in fewer negative cumulative effects due to the limited risk for additional sediment delivery and much reduced risk for direct mortality of cutthroat trout eggs that would occur on federal lands. There still would be sediment contribution occurring from existing roads on federal lands that would contribute to already elevated sediment levels. In addition, expansion of mining in the Clancy Creek drainage on non-federal lands as well as activities associated with additional salvage of beetle killed timber in the near future would likely result in some level of additional negative effects to fish habitat occupied by brook trout on nonfederal lands. However, some improvements would also occur through the fencing of riparian

habitat that has taken place on some of the non-federal lands along Clancy Creek owned by the mining company.

Alternative 3 – No Grazing

Direct and Indirect Effects

Under the no grazing alternative, all livestock grazing, except for recreational stock will be eliminated from National Forest System lands. Existing improvements that are no longer useful will be removed to prevent deterioration and accumulation of debris. Improvements will be removed. Permittees will be compensated for their share of investment in existing improvements. All fish habitats currently impacted by livestock grazing would improve. There would also be no direct mortality losses of fish due to livestock trampling.

Irreversible/Irretrievable Commitments

There would be no irreversible or irretrievable commitments of fishery resources as a function of the no grazing alternative.

Cumulative Effects

Cumulative effects that are considered for this analysis of the Clancy livestock allotment include effects from all past, present, and future reasonably foreseeable federal and non-federal actions that may impact fisheries. The cumulative effects analysis area for fisheries includes all lands within the Quartz Creek and Kady Gulch drainages as well as the headwaters of Clancy Creek downstream to the confluence of Quartz Creek.

The types of activities that could result in cumulative effects in the future include, but are not limited to, expansion of the existing mine in Clancy Creek, salvage timber harvest, green tree timber harvest, log hauling on unpaved county and private roads, livestock grazing, continued mineral exploration, oil and gas exploration/development, road maintenance, construction or maintenance of power transmission corridors, maintenance of irrigation diversions, maintenance of existing communication lines, maintenance of gasoline underground pipelines, crop production, herbicide application for weed control, ongoing road improvements (including specific road improvements to reduce sediment delivery and improve fish passage), subdivision, clearing of riparian vegetation within floodplains, mine waste removal, mine waste stabilization, and habitat improvement work. The cumulative effects from these types of activities would pertain to the proposed action, the no action alternative, and the no grazing alternative.

Although many of these activities might not be considered reasonably foreseeable as defined by federal guidance, it is important to recognize qualitatively that a number of them would likely occur at some point in the not too distant future- especially expansion of the existing mine in the Clancy Creek drainage and salvage logging of beetle killed trees on non-federal lands.

The overall cumulative effect on fish habitat quality from the various other future activities throughout the entire cumulative effects analysis area described above is difficult, if not impossible, to predict quantitatively as there is a lack of coordinated long range planning of activities between the various non-federal landowners and the federal land managers. It is anticipated that a variety of new activities, of the types discussed above, would occur in the future on non-federal lands as well as federal lands with effects on fisheries ranging from no effect, positive effects, minor negative effects up to adverse effects depending on the type of activity, magnitude of the activity, where and when the activity is occurring.

Many laws and regulations are in place to help reduce the potential for negative effects from activities conducted by all parties and it is likely that many of the activities would result in no effect or only minor negative short-term effects. However, some resource extraction activities occurring on non-federal lands would potentially result in adverse effects that could add to effects from federal lands and could result in some long-term negative effects to fish habitat in localized situations.

Conclusions and Forest Plan Consistency

This report addresses three grazing strategy options for upland ecosystems and riparian ecosystems with the focus on riparian functionality because maintaining the health of native riparian plant communities is key for maintaining the most stable, natural channels for optimum trout habitat conditions.

Under **Alternative 1** (current management), the grazing strategy in use is a *modified rest rotation* system where use is alternated between five pastures for up to 284 pairs (1230 AUMs) with a grazing season of June 25 to September 30. This *modified rest rotation system* for the Clancy allotment was designed so the three lower pastures (Kady/Locker, Mt. Washington and South Fork Quartz) all received a rest treatment but the two high elevation pastures (Bluebird and Occidental) did not have a rest scheduled in the rotation. If grazing continues within the season of June 25 to September 30 consistent with the current strategy, then stream-riparian conditions would remain unchanged from their current conditions as discussed under the Affected Environment section.

Under **Alternative 2** (proposed action), the grazing strategy would be a *modified rest rotation* system where use would be alternated between 4 pastures and would decrease cattle numbers to 160 pairs (750 AUMs) maximum, with a grazing season of June 16 to September 30, or equivalent AUMs. Cattle use in Kady Gulch and the South Fork of Quartz Creek would be after August 31 to protect spawning areas for westslope cutthroat trout. Approximately 400 meters of upper Clancy Creek will be protected by an electric fence to help address fisheries issues and riparian conditions in this reach would likely progress from *functioning at risk* with an upward trend, to *proper functioning condition*. The remainder of Clancy Creek on the HNF was rated as PFC.

Under **Alternative 3** (no grazing), fish habitat conditions would improve substantially.

As related to maintaining fisheries on range allotments the following elements are pertinent:

Page II-17- Maintain viable populations of existing native and desirable non-native species as measured by management indicator species. The fish management indicator species is the cutthroat trout.

Page II-22 – Maintain water quality and habitat for fish by coordinating Forest activities and by direct habitat improvements (see Forest Wide Standards for riparian.)

Page II-35-Riparian areas will be managed to be compatible with dependant wildlife species.

Page II-36 – For deferred rotation grazing systems livestock use of forage in riparian areas dominated by grasses should be 50% use by weight in the early pasture and 35% use by weight in the late pasture.

All alternatives address the above standards to some degree with the no grazing alternative meeting them best, followed by the proposed action. The no action alternative has the lowest likelihood of meeting these standards; especially as it relates to viability of cutthroat trout in Clancy Creek, Kady Gulch, and to a lesser degree the South Fork of Quartz Creek.

Wildlife, Affected Environment

Introduction

The *Environmental Assessment (EA)* for the Clancy Grazing Authorization describes three alternative approaches: a “No Action-Current Management” alternative, a “Proposed Action”. “No Grazing” scenario, and a The implications of a “No Action” scenario, along with a detailed account of existing conditions, are presented in the 2005 *Wildlife Background Report* for the Clancy-Unionville AMP Revisions—and are incorporated by reference into the current *EA* (Costain, 2005). A summary of expected effects under a “No Grazing” alternative are presented in the *EA* but will not be elaborated on in this report. The purpose of this report is to assess implications of the Proposed Action on wildlife resources in the Clancy Allotment.

The following assessment is tied to specific wildlife / grazing management issues. Some are concerns that have long been endemic to wildlife and allotment management; others have arisen more recently as a result of new research, observations by HNF personnel, or comments from members of the public.

Effects on Big Game Summer Range

Past Use Patterns

Winter range for deer and elk is confined to two enclaves in the eastern half of the allotment—one on either side of Kady Gulch and another south of Clancy Creek. Elk winter in these areas on the HNF when snow depths are not limiting. The bulk of the eastern half of the allotment surrounding these 2 blocks of winter range serves as transitional range in spring and fall for both deer and elk and as summer range for some deer. Summer range for elk, and many deer, is situated at higher elevation in the western half of the allotment.

While cattle and native grazers have competed for forage on summer ranges over the years, a number of factors have tempered the impacts.

The allotment is extensive, and the proportion of primary range is relatively large in relation to the number of cattle that have been present. A number of wildlife surveys in the Clancy allotment since 1995 have indicated that even in years when the allotment was fully stocked (under provisions of the 1988 AMP) summer forage on upland ranges was not a significant limiting factor to native grazers.

Cattle have not come onto the allotment until mid June and then gradually worked their way through the pasture rotation, arriving at the high elevation pastures on the Occidental Plateau in late July or early August. This has meant that at any given time, native ungulates have been able to exploit large segments of the allotment before cattle have been present. After cattle have gone, they have then been able to take advantage of fall green-up which typically develops more vigorously in areas that have been well-grazed during the summer.

Cattle and large native grazers partition habitat use by terrain as well. Cattle concentrate on moderate slopes, benches, drainage bottoms, and ridgetops. But they ignore or only lightly graze extensive foraging areas on steep slopes, in isolated parks, and in far-flung areas away from water or that they appear simply not to have time to get to in the course of the grazing season. Also, they tend to leave many productive sites in forested habitats to native species.

Direct competition between cattle and native herbivores has been centered on riparian and other wet sites. These productive habitats represent a limited resource that focuses both wildlife and livestock activity. Concentration of cattle around wet sites and in adjacent upland grazing habitat limits access for elk and deer. Because of the rotation system, cattle occupy these areas for only part of the summer, but their constant presence during this time deters elk and deer from coming in and their impact on the vegetation and soils reduces utility of the sites to wildlife after they are gone.

Expected changes

Proposals to maintain stocking at relatively modest levels, to use the South Fork Quartz pasture sparingly (“as needed”), and to restrict grazing in the South Fork and Kady Gulch to September will all serve to provide an abundant forage resource on upland ranges for native ungulates. Because this resource has not been limiting in the past, it is unlikely that the new set-up will lead to increased production in deer and elk populations. It will, however, provide more grazing options for these species and allow for their wider distribution throughout the allotment. This may enhance survivorship. It probably has few implications for moose.

Likewise, proposed changes in allotment management (compared to stocking patterns allowed in the 1988 AMP), will ensure lower levels of livestock damage in focal summer habitats such as riparian areas, wet meadows, and aspen stands. This will provide opportunities for more wildlife use of these key sites.

Effects on Big Game Winter Range

Winter Range

The 2004 version of the Montana Fish, Wildlife and Parks (MFWP) elk range map shows the entire eastern half (about 60%) of the Clancy allotment as elk winter range. MFWP field observations on which this classification is based, however, show that virtually all winter observations are confined to 2 areas within this larger swath—one around lower Kady Gulch (including Locker Flats) and the other south of Clancy Creek in the Mt Washington pasture.

Field observations in the remainder of MFWP “winter range” are from fall and spring (G. Joslin, personal communication), indicating that most of the eastern portion of the allotment is serving as transitional range, and not as winter range. This interpretation is supported by HNF wildlife surveys (1992-2008) and by Helena Forest Plan big game seasonal range maps (Styskel 1980), which show the Kady Gulch and Mt Washington areas as winter range, but nothing else.

Habitat surveys in the 1990’s, when the allotment was fully stocked, found that cattle grazing removed a substantial portion of the available forage from winter range grasslands around Kady Gulch before elk descended to the area from summer range in the fall. Grazing on adjacent private land just east of the allotment was even heavier. Still, evidence suggested that fall/winter/spring elk (and to a lesser extent, deer) use of this part of the allotment was extremely heavy. The Montana Tunnels mine less than a mile southeast of lower Kady Gulch has usurped a substantial block of local winter range, putting more pressure on remaining rangelands on the National Forest and on private ranchland further east.

Expected Changes

Since cattle numbers on the Clancy allotment have declined precipitously in the last few years, forage available to wintering elk and deer on the 2 blocks of HNF winter range has increased dramatically. Unlike previous decades, when much of the available forage was in the form of short fall green-up, most of the current biomass is composed of a much greater volume of cured bunchgrasses. This is primarily of benefit to elk, less so to mule deer. Mule deer wintering habitat on the Forest has been limited by a shortage of winter browse (bitterbrush, sagebrush, mountain mahogany, chokecherry, and so on).

The new AMP, with its lower livestock numbers and modified rotation, will maintain substantially more forage biomass for wintering ungulates than was the case under the old AMP. This makes the option of remaining on National Forest winter ranges a more viable one for elk and deer. Be that as it may, these animals will still need to move down to lower elevation ranges on private land during deep-snow winters.

Ungrazed Habitat Reserves

The Proposed Action will leave the South Fork Quartz Creek pasture vacant unless it is needed during summers when forage availability is limiting in other pastures. In those cases, the pasture will be grazed only after August 31. So, for the most part, the South Fork pasture will remain a grass reserve, available to native species, but off-limits to cattle. Even in years when it is necessary to turn cattle into the pasture, it will remain livestock-free for most of the summer.

Since forage availability on upland range has not been a problem in this pasture in the past, it is unlikely that, under normal circumstances, the enhanced food supply will lead to measurably greater productivity among native ungulates. However, it is likely to broaden distribution, allowing animals to graze throughout the summer in more moderate terrain and other productive areas where they have been limited by livestock in the past. The greater availability of habitat options may contribute to survivorship. For small mammals and many ground-nesting birds, the availability of more biomass (more cover) throughout most of the pasture may expand the habitat base to the point that measurable population increases occur.

The most significant effect of not having cattle in the South Fork pasture will be seen in riparian areas, mostly along the creek, where vegetation biomass is truncated each year and vegetation structure simplified by concentrated cattle use in past summers. Removal of this impact will measurably elevate

habitat opportunity in these productive sites for a number of wildlife species. In addition, the absence of the cattle themselves will allow elk and deer to make more complete use of key sites from which they have been periodically excluded in the past as a result of their aversion to cattle.

Effects on Wildlife Connectivity

AMP objectives designed to advance rangeland site productivity, improve key habitat associations, and improve the productivity and structural integrity of riparian vegetation all contribute to the functioning of wildlife corridors. These range improvements translate into local increases in the abundance and continuity of cover and forage that allow a variety of wildlife species to move more easily through the allotment with less risk of conflict with humans and other species. No dramatic changes are likely, but a more continuous distribution of high quality rangeland and riparian habitat contribute cumulatively (particularly when combined with declines in road and motor trail densities) to an upward trend in the quality of local movement corridors and region-wide linkage.

Specific management actions that may be undertaken in the future under adaptive management and that will need to be scrutinized with regard to movement corridors are (1) the placement of salting areas and water developments designed to spread out livestock use and (2) construction of new fences that could locally interfere with movement routes for some animals.

Effects on Aspen Habitats

Reduction in cattle numbers, shortening of grazing periods in some pastures, fencing designed to exclude cattle from sensitive habitats, and judicious use of the South Fork Quartz Creek pasture is likely to alleviate pressure on some aspen stands. This should allow understory ground flora (particularly along the South Fork) to remain relatively intact, providing cover for ground nesting birds and small mammals and forage for native grazers. However, it is not likely to alleviate one core problem: suppression of aspen regeneration by heavy browsing. This browsing pressure comes primarily from elk, deer, and moose. The diminution of livestock influence is unlikely to generate significant improvement.

In cases where, under adaptive management, aspen improvement efforts are undertaken, project areas may be fenced to allow young aspen to escape the browse zone. While the prohibition of cattle from these sites will undoubtedly improve the chances of project success, the fencing would be designed primarily to exclude the most damaging browsers—elk, moose, and deer.

Implications for Cowbird Nest Parasitism

Brown-headed cowbirds have not been observed in any abundance on the Clancy allotment, but they have been picked up on Landbird Survey point-counts in open areas in this part of the Divide landscape and they can be seen wherever numbers of cattle congregate for any length of time. Cowbirds depend on the cattle to stir up insects for them as they graze, but they are apparently are not adapted to associating in the same way with elk or deer. Their significance for wildlife stems from their aggressive parasitism of other songbird nests—replacing the eggs of warblers, sparrows, flycatchers, wrens, vireos, and others with their own. Cowbirds can significantly reduce nesting success in local songbird populations, particularly in riparian habitats (Young and Hutto 1999a).

Proposed reduction in cattle numbers and shortening of certain grazing periods may shrink the local cowbird population to a degree, but these actions are more likely to alter its distribution—and perhaps inhibit its effectiveness in parasitizing songbird nests. Restricting cattle presence in riparian areas would reduce opportunities for cowbirds in some of their most preferred habitats. On the other hand, any future water developments and other management tools designed to spread cattle more evenly over the uplands may introduce cowbirds into parts of the allotments they do not now frequent. Whether greater dispersion of cattle will dilute the cowbird population is unknown.

Effects on Riparian Habitats

The Proposed Action will reduce livestock influence in streamside riparian sites by (1) limiting use of the South Fork of Quartz Creek and Kady Gulch to one month toward the end of the grazing season,

(2) not grazing the South Fork at all unless needed, in some years, to make up for deficient forage in other pastures, (3) reducing numbers of cattle in all pastures to a degree that their impact on riparian sites will be measurably less, (4) fencing cattle out of sensitive riparian habitat in upper Clancy Creek, and (5) continuing to monitor other riparian areas so future problems can be addressed by adaptive management as needed.

Benefits to wildlife communities resulting from vegetation recovery in heavily impacted areas will become evident gradually over a period of 5 to 10 years (Skovlin 1984). Removal of cattle from more lightly grazed riparian sites is unlikely to substantially improve vegetative diversity, production, or shrub health. Primary benefits to wildlife will stem from increased biomass of ground vegetation, greater vegetation diversity, gradual restoration of trampled and compacted soils, less sedimentation in the aquatic environment, and the absence of large, lumbering bovines encumbering the riparian environment.

The current overbrowsing of mature riparian shrubs, however, is unlikely to decline as long as numbers of large native browsers remain at current levels. Some stream reaches on the Clancy allotment (upper Kady Gulch, the middle South Fork, among others) will be unaffected by changes in management because cattle are not currently using them (a function of dense timber, steep terrain, absence of suitable forage, remoteness, or diminutive size).

Effects on Key Wet Sites

Roads, motor trails, and other human developments are the primary agents in undermining integrity of key habitat sites such as seeps, springs, swamps, bogs, wet meadows, and other sub-irrigated habitats. In most cases, livestock presence is a secondary influence, which by itself, has not depressed habitat integrity to “low” at any of the wet sites on the Clancy allotment. It is, however, an obvious contributing factor at many sites.

Halving livestock numbers under the Proposed Action will reduce, but not eliminate, grazing/trampling impacts at most of these sites. Under adaptive management, key wet sites will be monitored to see how their condition might be improved by adjustments in livestock management. It would be possible to fence some sites, but in many cases it may be more practical to deter livestock use by dispersing cattle more efficiently through the uplands (upland water developments, drift fencing), reducing grazing season (as will be done in Kady Gulch and the South Fork), and reserving some areas from use in all but years when other pastures are under stress (as is proposed for the South Fork).

Effects on Threatened and Endangered Species

The following summary of the status of threatened and endangered species and potential effects of the Proposed Action comes from the *Biological Assessment* for the Clancy AMP Revision . At issue are two threatened species—the grizzly bear and the Canada lynx—and one endangered species—the northern Rocky Mountain gray wolf. The assessment has determined that continued grazing at reduced levels in the Clancy allotment *may affect, but is not likely to adversely affect* the three species. The determination is based on the fact that grazing livestock on the allotment has ongoing implications for the three T&E species and that, while the Proposed Action will measurably reduce these impacts, some of the effects will remain.

The following table (Table 3.7) summarizes the status of TES species in the Clancy allotment project area.

Table 3-7 Status of TES Species in the Clancy Allotment Project Area

Species	Status in the Clancy Allotment Project Area
	<p><u>Wolf Presence:</u> No wolf packs have been active near the Clancy allotment in recent decades, and no individual wolves have been reported in the area. The Boulder wolf pack occupied a range a few miles to the west from 1995 to 2000, and wolves may have moved through the allotment occasionally during that time. Given the relatively consistent flow of wolves into the Divide landscape from the north over the last 15</p>

Gray Wolf	<p>years, it is likely that the Clancy allotment will see more wolf activity in the future.</p> <p><u>Wolf Habitat:</u> There are no habitat components that would draw wolves into one part of the allotment more than another. However, the potential for predation is probably higher in the more remote western reaches of the allotment on the Occidental plateau and around Bluebird Flats—areas largely on the Beaverhead-Deerlodge NF.</p> <p><u>Negative Encounters:</u> No negative encounters between wolves and humans or livestock have been reported in or near the allotment in recent decades.</p> <p><u>Proposed Changes:</u> Under the Decision to continue grazing, cattle numbers will decline by roughly 45% from currently authorized levels and distribution will contract in some pastures. However, the presence of cattle in remote rangeland locations leaves open the possibility of future wolf predation should packs become established in this area.</p> <p><u>Management Direction Compliance:</u> The proposed AMP revision complies with management direction in the <i>Helena Forest Plan</i> and the <i>Wolf Recovery Plan</i> for reducing potential conflicts between wolves and livestock.</p> <p><u>Determination:</u> AMP revision <u>May Affect, but is Not Likely to Adversely Affect the Wolf.</u></p>
Canada Lynx	<p><u>Lynx Presence:</u> No lynx have been identified within the allotment in the last 20 years. However, MFWP winter track surveys have detected lynx on several occasions in the Boulder River watershed just to the west.</p> <p><u>Lynx Habitat:</u> The <i>Northern Rockies Lynx Mgmt Direction (NRLMD)</i> considers lynx habitat in this area to be “occupied”. The allotment falls within LAU DI-06, of which 27% is considered potential lynx habitat. Just over 11% of this potential habitat is considered viable snowshoe hare habitat. The HNF classifies approximately 36% of the Clancy allotment as potential lynx habitat—roughly 8% of which is snowshoe hare habitat.</p> <p><u>Cattle Impacts:</u> Cattle are able to access small pockets of potential lynx habitat along South Fork Quartz Creek, Kady Gulch, upper Clancy Creek, and on the Occidental Plateau. Their concentration at these sites may be retarding shrub growth, but primarily it impairs maintenance of robust ground vegetation that can help to support snowshoe hares. Cattle grazing and loafing in aspen stands adjacent to primary grazing areas pares down understory vegetation but has only a modest effect on aspen regeneration.</p> <p><u>Proposed Changes:</u> The Decision outlines measures to protect and revitalize key riparian sites. Cattle presence in a number of riparian areas will decline to the point that more vigorous ground vegetation capable of supporting snowshoe hares can develop and persist through the summer.</p> <p><u>Management Direction Compliance:</u> The AMP revision complies with all grazing management guidelines in the <i>Northern Rockies Lynx Management Direction (GRAZ G1, G2, G3, G4)</i>.</p> <p><u>Determination:</u> AMP revision <u>May Affect, but is Not Likely to Adversely Affect the Lynx.</u></p>
Grizzly Bear	<p><u>Grizzly Presence:</u> The allotment lies 17 mi S of the NCDE grizzly bear “Distribution Zone”. Grizzlies have been reported in the Cataract Creek drainage just west and northwest of the allotment several times since 1990. A grizzly bear was identified in the southwest corner of the allotment in 2001. None have been reported since, but they probably continue to range through this area on the Occidental Plateau and Bluebird Flats on occasion. Local population density is very low.</p> <p><u>Grizzly Habitat:</u> Key habitats where grizzlies might encounter cattle occur in the upper reaches of Kady Gulch, Clancy Creek, South Fork Quartz Creek, and across the Occidental Plateau and Bluebird Flats.</p> <p><u>Negative Encounters:</u> No negative encounters between grizzly bears and humans or livestock have been reported in or near the allotment in recent decades.</p> <p><u>Proposed Action:</u> Under the Decision to continue grazing, cattle numbers will decline by roughly 45% from currently authorized levels and distribution will contract. A variety of means (reduced numbers, shorter grazing periods, fencing) will be employed to reduce cattle presence in productive habitats that might also attract the attention of grizzly bears. Cattle, however, will continue to graze in a number of areas where they might come into contact with bears in the future.</p>

	<p><u>Management Direction Compliance:</u> The proposed AMP revision complies with management direction in the <i>Helena Forest Plan</i>, the <i>Grizzly Bear Recovery Plan</i>, and the <i>IGBC Guidelines</i> (for Management Situation 5) with regard to reducing potential grizzly bear/ livestock conflicts.</p> <p><u>Determination:</u> AMP revision <u>May Affect, but is Not Likely to Adversely Affect</u> the Grizzly Bear.</p>
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Effects on Sensitive Species

The following species are known or suspected to occur on the Helena National Forest and are listed as “sensitive” by the forest Service Northern Regional Office (Missoula). These species may have population viability problems. As with threatened and endangered species, the continued presence of cattle on the allotment generates ongoing impacts on some sensitive species even though these effects will be reduced by implementation of the new AMP.

The following table (Table 3-7.) summarizes the effects on sensitive species in the Clancy allotment project area.

Table 3-8 The Effects of Cattle Grazing on Sensitive Species

Species	Effects	Comments
Wolverine	No impact	Livestock management has no implications for individual wolverines or their population viability.
Fisher	No impact	Livestock management on the allotments has no implications for individual fishers or their population viability.
Bald Eagle	No impact	Bald eagles are not present on the allotment. Livestock grazing has no implications for eagle habitat.
Northern Bog Lemming	May affect individuals but not population viability	Bog Lemmings are not known to be present on the allotment. Small pockets of existing habitat (sphagnum bogs) subject to trampling by cattle are present on the Occidental Plateau. Reduction in cattle numbers with a view to protecting wet sites has potential to benefit bog lemming habitat.
Townsend's Big-Eared Bat	No impact	Reduced grazing pressure in a few open-forest and shrub habitats may marginally improve populations of insects preyed-upon by big-eared bats. These effects would be local and unlikely to translate into improved survivorship or productivity, given the mobility of bats. Big-eared bats have not been identified in this area.
Peregrine Falcon	No impact	Livestock management on the allotments has no implications for individual peregrine falcons or their population viability.
Flammulated Owl	No impact	Reduced grazing pressure in a few open-forest habitats with large trees may improve populations of large insects preyed-upon by flammulated owls. These owls have been identified in the Mt Helena area to the north, but not in the Clancy allotment.
Harlequin Duck	No impact	The allotment has no stream habitat capable of supporting harlequin ducks. Livestock grazing on the allotments has no implications for harlequin ducks.
Black-backed Woodpecker	No impact	Livestock grazing has no effect on dead tree habitats used by black-backed woodpeckers. These woodpeckers have not been identified in this area.
Leopard Frog	No impact	Leopard frogs have not been identified in the Divide landscape in over 15 years and are probably extinct in this area. Livestock concentrations in riparian areas may disrupt potential shoreline breeding habitat. The Proposed Action will reduce these impacts.
Western Toad	May impact individuals but not population viability	Western toads are present in a variety of aquatic and upland habitats on the allotment. Cattle can disrupt shoreline breeding habitat around small ponds and slow stream sections. The Proposed Action will reduce this influence.
Plains Spadefoot Toad	No impact	Spadefoot toads are not present in the Divide landscape.

Effects on Management Indicator Species

The Helena Forest Plan has designated the following species as management indicators for the particular habitats (old-growth forest), habitat components (mature trees, snags), or special species groups (commonly hunted species, threatened/endangered species). The HFP threatened and endangered species (grizzly, wolf, bald eagle, peregrine falcon) are covered in the previous 2 tables.

Table3-9 The Effects of Cattle Grazing on Management Indicator Species

	Implications for Population Viability	Comments
American Marten	No effect on habitat or population viability	Livestock grazing is having no effect on the dense forested habitat used by marten. Implementation of the new AMP will generate no new impacts.
Northern Goshawk	No effect on habitat or population viability	Livestock grazing is having no effect on dense forest habitats where goshawks nest. Cattle resting in and trailing through more open forest habitats has no effect on goshawk foraging. Proposed changes in AMP management has no implications for goshawks.
Pileated Woodpecker	No effect on habitat or population viability	Livestock grazing and management are having no effect on pileated woodpeckers. Implementation of the revised AMP will have no new impact.
Hairy Woodpecker	No effect on habitat or population viability	Livestock grazing and management have no effect on hairy woodpeckers. Implementation of the new AMP will not change this.
Elk	Increased availability of upland forage and improved riparian habitats will enhance habitat opportunity for elk. No improvement in population viability is likely.	Upland forage has not been limiting in the past, but cattle presence around wet sites has deterred elk use and diminished biomass. The new AMP will provide more forage in upland habitats and reduce pressure in key habitats on which both species focus.
Mule Deer	Increased availability of upland forage and improved riparian habitat will enhance habitat opportunity for deer. No improvement in population viability is likely.	The Proposed Action will reduce cattle presence and impacts on vegetation in key riparian habitats and aspen stands—thereby reducing direct competition with mule deer.

Grazing and Forest Succession

Currently, cattle appear to be having virtually no influence in retarding conifer forest succession in the Clancy allotment. The only cutting units on the allotment are on the far southwestern fringe on the Beaverhead-Deerlodge NF. Cattle loafing areas in a variety of forest/grassland ecotones show minor damage to a few conifer young seedlings and saplings, but the overall result for forest succession is trivial. In fact, the issue with young conifers is that too many of them are colonizing grasslands—particularly in the South Fork Quartz and Kady-Locker pastures—and eliminating productive upland range. More notable, is the manner in which cattle contribute to the inability of aspen stands to regenerate—browsing on some of the young shoots and damaging others by congregating in the stands. Primary damage to regenerating aspen appears to come from native browsers, but cattle are part of the problem as well.

Reduction of cattle numbers will lessen some of the pressure on aspen habitats, and any future projects undertaken through the adaptive management process designed to protect aspen regeneration (by temporarily fencing out cattle and large native browsers) will enhance the ability of those communities to undergo normal succession. AMP revision will have essentially no effect on the relationship of cattle to conifer forest succession.

Effects on Ground-Nesting Birds

Reduction in cattle numbers, confining grazing in Kady Gulch and South Fork Quartz Creek to the month of September, leaving the South Fork as a cattle-free pasture in most years will all contribute to expanding robust ground cover for small mammals and ground nesting birds. The new emphasis on

late-season grazing in Kady Gulch and the South Fork combined with traditional late summer use of the Occidental Plateau and Bluebird Flats will provide abundant, continuous grassland habitat (grazed only by native herbivores) throughout the spring and early-mid summer nesting periods for most birds.

Implications for Predator Control

Predator control operations on Forest Service lands are conducted by Wildlife Services—a division of the Animal and Plant Health Inspection Service of the U.S. Department of Agriculture. The Helena National Forest is covered by an annual Animal Damage Work Plan. The plan must be approved by the Forest each year, but its administration lies outside the purview of allotment management. Complaints of predation on livestock inevitably originate with ranchers, who request Wildlife Services to come in and deal with the predators.

In the Clancy allotment area, most problems are with coyotes and mountain lions (rather than wolves or bears). Most are resolved on private land and do not involve the National Forest.

In recent years there have been no predator control actions in or near the Clancy allotment involving grizzly bears or wolves.

The Clancy AMP revision does not address predator control and will have no influence on the decisions of Wildlife Services to remove livestock predators.

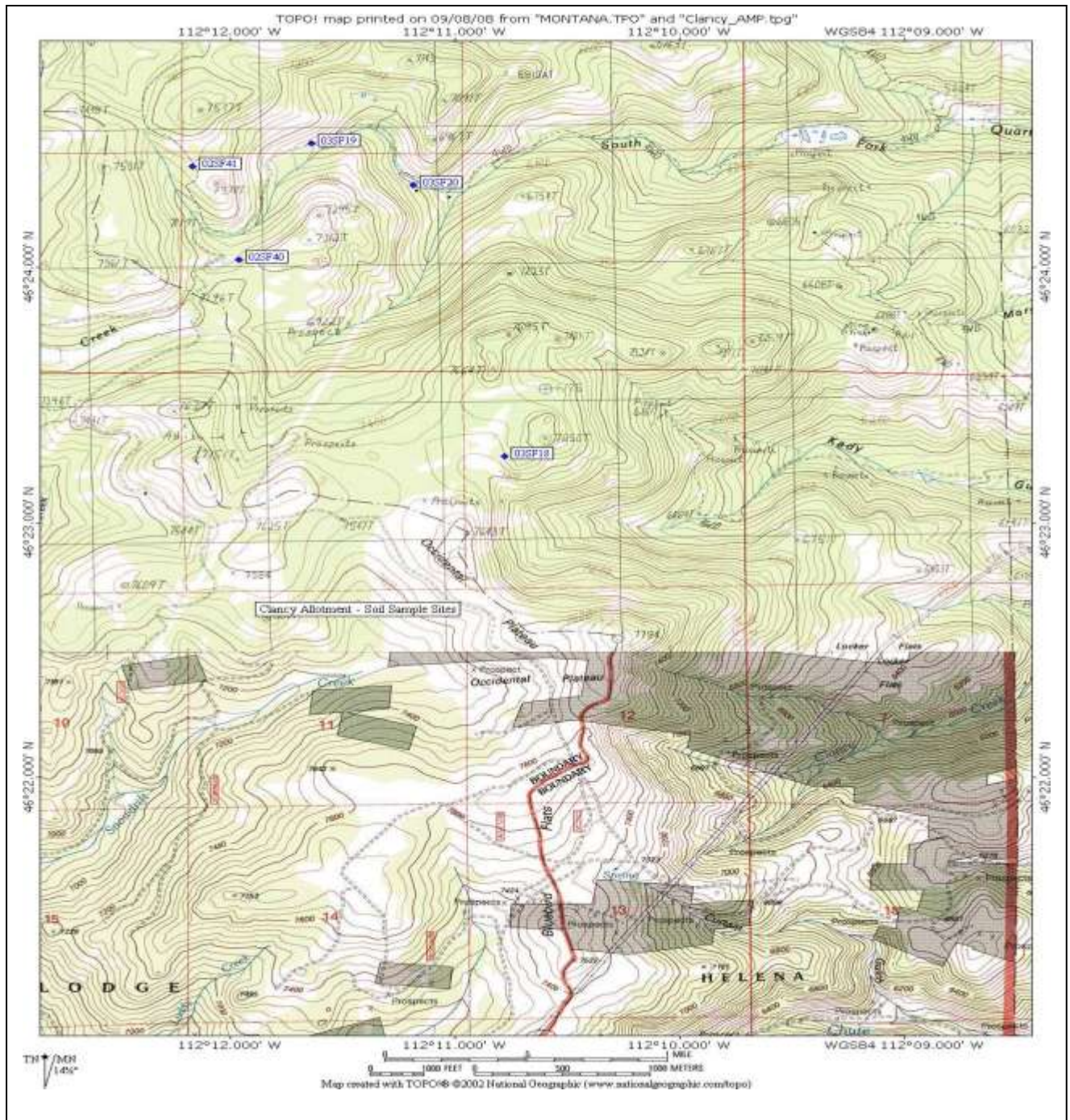
Soils, Affected Environment

Introduction

The Forest Service is legally mandated to complete an “evaluation of each management system to the end that it will not produce substantial and permanent impairment of the productivity of the land” (16 U.S.C. 1600, 1976; Section 6(g)(3)(C) and (E)(i), the National Forest Management Act).

Similarly, the Helena National Forest Plan provides guidance for soil management, which states, “all management activities will be planned to sustain site productivity” (USDA Forest Service 1986, page II-26). Soil quality standards for Region 1 (USDA Forest Service 1999) are used as threshold values to determine compliance of management activities with legal mandates under NFMA to sustain soil productivity (16 U.S.C. 1600, 1976; USDA Forest Service 1986). These soil standards are intended as guidelines to be applied for design and evaluation of management activities. The Helena National Forest Plan provides further guidance: “During project analysis, ground disturbing activities will be reviewed and needed mitigating actions will be prescribed” (USDA Forest Service 1986, page II-26).

Figure 3-1 Field Sites Where Soil Conditions Were Evaluated



Landtypes Affected by the Allotment

Within the Clancy Allotment area, there are 21 landtypes mapped (USDA Forest Service and Natural Resources Conservation Service 2001). A summary of key soil characteristics for these landtypes is displayed in Table 3-8. There are no landtypes mapped within the project which would qualify as prime farmland, jurisdictional wetlands, or other ecologically critical soil types.

Table 3-10. Key Soil Characteristics for Landtypes within the Clancy Allotment

Landtype Number	Landform	Geology	Slope Gradient	Topsoil Texture
12C	Moraines	Glacial till from granitic rocks	15-40%	Loam with surface loess influenced by volcanic ash
12D	Moraines	Glacial till from granitic rocks	25-50%	Cobbly Loam
13A	Moraines or Glaciated Mountain Ridges	Glacial till from basalt or metasedimentary rock	10-25%	Cobbly Loam
14	Basins and Toeslopes	Colluvial deposits from basalt and metasedimentary rocks	25-50%	Very Cobbly Loam
14C	Basins and Toeslopes	Colluvial deposits from basalt and metasedimentary rocks	10-40%	Very Cobbly Loam
36-	Rolling Uplands (bouldery)	Granitic rock	25-40%	Coarse Sand
36A	Rolling Uplands	Granitic rock	10-40%	Gravelly Sandy Loam
37-	Rolling Uplands	Basalts, tuffs, andesites and breccias	10-40%	Cobbly Loam
47-	Mountain Slopes	Basalts, tuffs, andesites and breccias	25-40%	Cobbly Loam
57-	Mountain Ridges	Basalts, tuffs, andesites and breccias	10-40%	Extremely Cobbly Loam with surface loess influenced by volcanic ash
57A	Mountain Ridges (cold)	Basalts, tuffs, andesites and breccias	10-40%	Extremely Cobbly Loam with surface loess influenced by volcanic ash
76-	Glaciated Mountain Slopes (bouldery)	Granitic rock	25-50%	Gravelly Loam with surface loess influenced by volcanic ash
76A	Glaciated Mountain Ridges (bouldery)	Granitic rock	10-25%	Gravelly Loam with surface loess influenced by volcanic ash
77A	Mountain Ridges	Basalts, tuffs, andesites and breccias	10-25%	Loam
86-	Glacial Trough Walls	Granitic rock	60-90%	Very Gravelly Sandy Loam
87-	Glacial Trough Walls	Metasedimentary rock and basalt	60-90%	Very Channery Loam
89-	Glacial Trough Walls	Granitic rock	60-90%	Gravelly Loam with surface loess influenced by volcanic ash
90-	Glacial Trough Walls	Metasedimentary rock and basalt	60-90%	Silt Loam to Cobbly Silt Loam with surface loess influenced by volcanic ash
136	Moraines with Wet Soils	Glacial drift	0-10%	Sandy Clay Loam to Very Cobbly Sandy Loam
360	Mountain Ridges (bouldery)	Granitic rock	10-40%	Gravelly Sandy Loam
790	Glaciated Mountain Slopes	Glacial till from meta-sedimentary rock	25-40%	Loam with surface loess influenced by volcanic ash

Primary range within the Clancy allotment is generally found on five landtypes: 36A, 37, 77A, 136 and 360. These five landtypes support grassland ecosystems, which provide primary range forage within the allotment.

The remaining sixteen landtypes typically support forest vegetation: 12C, 12D, 13A, 14, 14C, 36, 47, 57, 57A, 76, 76A, 86, 87, 89, 90 and 790. These landtypes are generally capable of providing forage on transitory range within timber harvest units. The landtypes with forest vegetation may also have inclusions¹ of primary range such as small meadows or riparian stringers.

Soil Resource Existing Condition

During the summers of 2002 and 2003, existing soil conditions were evaluated within the Clancy allotment (Table 2 and Figure 1). Two sites were evaluated in 2002: soil plots 02SF040 and 02SF041. Three sites were evaluated in 2003: soil plots 03SF018, 03SF019 and 03SF020

Table 3 11. Waypoints for Site Evaluations

Soil Plot ID	GPS Waypoint Coordinates (NAD 83)	Landtype	Vegetation Community
03SF018	12T 409294 mE 5137798 mN	36A	Grassland
03SF019	12T 408799 mE 5139776 mN	12D	Forest with Meadow Inclusion
03SF020	12T 408227 mE 5140088 mN	12D	Forest with Meadow Inclusion
02SF040	12T 407800 mE 5139247 mN	360	Grassland
02SF041	12T 407542 mE 5139930 mN	76A	Grassland

Copies of the field data sheets for information collected at each monitoring site are available in the project record. A summary of the monitoring results for the Clancy allotment will be presented in this report (Table 3).

Table 3-12 Summary of Soil Monitoring Data Collected within the Clancy Allotment.

Soil Plot ID	Topsoil Texture	Avg. Rate of Infiltration (L/32.5 min)	Avg. of Bulk Density (g/cc)	Bare Ground (%)	Avg. Depth of "A" Horizon (cm.)	Avg. Rooting Depth & Abundance (cm.)	Rooting Depth & Abundance (% of "A" horizon filled)
03SF018	Sandy Loam to Loam	3.6	0.94	0%	23	11	51%
03SF019	Sandy Loam to Loam	4.2	1.28	8%	24	14	57%
03SF020	Sandy Loam	9.0	1.19	25%	15	13	93%
02SF040	Sandy Loam	10.5	NR ¹	20%	12	12	96%
02SF041	Loamy Sand to Sandy Loam	NR	NR	8%	17	16	96%

From field evaluation during summer 2002, soil data indicates soil quality is adequate to support healthy rangelands at 1 of 2 sites sampled (USDA Forest Service 2002). For the remaining 1 site, soil quality

¹ NR indicates no records were collected for this data parameter at that monitoring site.

may not be at levels desired for maintaining healthy rangelands. On this 1 site, soil quality may be either slightly impaired or near the threshold for adverse impacts: sample plot number 02SF040 had bare ground in excess of 15 percent.

From field evaluation during summer 2003, soil data indicates soil quality may not be at levels desired for maintaining healthy rangelands at the three sites sampled (USDA Forest Service 2003). For one site, soil quality may be either slightly impaired or near the threshold for adverse impacts: sample plot number 03SF020 had bare ground in excess of 15 percent, where the cause is not certain but may be grazing-related. On two sites, sample plot numbers 03SF018 and 03SF019 had infiltration rates comparable to values obtained on compacted native road surfaces in the area, and the plant root mat filled only about half of the "A" horizon.

Soil Conditions

A recent review of livestock grazing studies found, "very few studies of truly ungrazed landscapes exist". And "we lack a clear ecological benchmark for determining the effects of grazing" (Fleischner 1994, page 630). Consistent with this review, there are no historic soil condition monitoring data for the Clancy allotment. Thus, there is no well-defined benchmark for determining changes in soil condition associated with past livestock grazing in the project area.

Conclusions regarding how past livestock grazing may have affected current soil conditions will be based on professional interpretation of soil monitoring data. This is consistent with recommendations by the National Research Council regarding rangeland monitoring: "evaluation of what constitutes a healthy, at risk, or unhealthy distribution of plants, bare areas, rooting depths, and growth periods will depend primarily on informed judgments" (National Research Council 1994, page 120).

This analysis of grazing effects on soils will not offer conclusions regarding compliance with regional soil quality standards, because these regional standards require evaluating quantifiable changes in existing soil conditions compared to undisturbed soils. Since there are no historic rangeland soil condition monitoring data for the Clancy allotment, nor are there any known areas of ungrazed rangelands to provide a comparison for grazed sites, there is no well-defined benchmark for determining changes in soil condition associated with past or ongoing livestock grazing in this allotment.

The activity area, considered for analysis of environmental consequences in this soil resource report, is comprised of the primary upland range sites within the Clancy allotment. This activity area applies to analysis of direct, indirect and cumulative soil resource effects. An evaluation of riparian range conditions can be found in the Hydrology and Fisheries Resource Specialist Reports for the Clancy allotment, and will not be repeated in this report.

Soils, Environmental Consequences

Alternative 1, No Action -Current Management

Direct and Indirect Effects

If grazing continues under the existing management strategy, it is predicted that soil resource conditions will remain the same as the existing condition, as described in the previous section of this report. It is my professional judgment that these sites may currently be in an upward trend for long-term recovery compared to historic conditions (refer to section on "Assumptions").

Cumulative Effects

Within the Clancy allotment, soil cumulative effects from past logging combined with ongoing grazing may exist on transitory primary range. It is my professional judgment that these sites should be in an upward trend for long-term recovery. I base this judgment on my field observation of soil conditions in similar areas within other allotments.

Soil cumulative effects could occur from future grazing combined with reasonably foreseeable tree thinning and prescribed burning planned with the Clancy-Unionville Vegetation Management Project (hereafter referred to as the Clancy-Unionville Project). To mitigate potential soil cumulative effects in areas of the allotment potentially affected by Clancy-Unionville Project treatment units, it is recommended that grazing be deferred following tree thinning and prescribed burning. Grazing should be deferred for at least 1 to 2 years following Clancy-Unionville Project vegetation treatments, to minimize possible cumulative effects of grazing and vegetation treatments.

Irreversible/Irretrievable Commitments

An irreversible commitment represents a total loss of a resource, which cannot be replaced. An irretrievable commitment represents a temporary loss of a resource, which can be replaced over time. Soil disturbance associated with grazing in the Clancy allotment would be an irretrievable commitment of soil resource, because soils would recover from grazing effects through natural recovery processes.

Alternative 2, Proposed Action

Direct and Indirect Effects

If grazing continues in a manner consistent with the existing management strategy, it is predicted that soil resource conditions would be improved over the long-term compared to the existing condition (i.e. Alternative 1), because of reduced grazing. If adaptive management strategies are implemented in areas where monitoring indicates a need to improve rangeland resource conditions, then it is anticipated that soil conditions may improve more rapidly in areas where soil quality is currently not at levels desired for maintaining healthy rangelands. Nonetheless, improvement in soil resource conditions would be a long-term effect (i.e. as many as 30-40 years or more) since rangelands are slow to recover once they are depleted by grazing impacts (McLean and Tisdale 1972).

Cumulative Effects

Within the Clancy allotment, soil cumulative effects from past logging combined with ongoing grazing may exist on rangeland. It is my professional judgment that these sites should be in an upward trend for long-term recovery. I base this judgment on my field observation of soil conditions in similar areas within other allotments.

Soil cumulative effects could occur from future grazing combined with reasonably foreseeable tree thinning and prescribed burning planned with the Clancy-Unionville Vegetation Management Project (hereafter referred to as the Clancy-Unionville Project). To mitigate potential soil cumulative effects in areas of the allotment potentially affected by Clancy-Unionville Project treatment units, it is recommended that grazing be deferred following tree thinning and prescribed burning. Grazing should be deferred for at least 1 to 2 years following Clancy-Unionville Project vegetation treatments, to minimize possible cumulative effects of grazing and vegetation treatments.

Irreversible/Irretrievable Commitments

An irreversible commitment represents a total loss of a resource, which cannot be replaced. An irretrievable commitment represents a temporary loss of a resource, which can be replaced over time. Soil disturbance associated with grazing in the Clancy allotment would be an irretrievable commitment of soil resource, because soils would recover from grazing effects through natural recovery processes.

Alternative 3, No Grazing

Direct and Indirect Effects

Because no livestock use would occur under Alternative 3, there would be no direct or indirect effects on soil resources from grazing.

Termination of grazing provides the greatest potential to restore soils, at the most rapid rate, in areas that have previously been impacted by grazing (Belsky et al. 1999, page 429). With recovery, increased plant vigor and root biomass will reduce bare ground, increase soil organic matter and nutrient cycling, break up soil compaction, and improve soil infiltration and water holding capacity.

Rangelands where soils are currently in healthy condition will recover the most rapidly, compared to other areas with impaired soil conditions. This recovery may occur within 5 years after livestock removal (Fleischner 1994, page 637). Rangelands where soil conditions are currently impaired will require more time for restoration. This recovery may require several decades (Dormaar and Willms 1990, page 456).

Cumulative Effects

Because no grazing would occur under Alternative 3, there would be no soil resource cumulative impacts from grazing combined with other management activities. This alternative would have the greatest potential to cumulatively improve soil conditions within the project area, due to termination of grazing.

Irreversible/Irretrievable Commitments

An irreversible commitment represents a total loss of a resource, which cannot be replaced. An irretrievable commitment represents a temporary loss of a resource, which can be replaced over time. Because no grazing would occur under Alternative 3, there would be no irreversible or irretrievable commitment of soil resources in association with grazing.

Conclusions and Forest Plan Consistency

Under Alternatives 1 and 2, if grazing continues in a manner consistent with the existing allotment management strategy, then it is predicted that soil resource conditions would remain the same as the existing condition, as described in the Affected Environment section of this report.

Under Alternative 2, if adaptive management strategies would be implemented in areas where monitoring indicates a need to improve rangeland resource conditions, then it is anticipated that soil conditions may improve more rapidly compared to existing conditions.

Under Alternative 3, termination of grazing provides the greatest potential to restore soils, at the most rapid rate, in areas that have previously been impacted by direct or indirect effects of grazing and cumulative effects with past logging.

NFMA and Forest Plan Consistency

For sites where soil quality is currently adequate to support healthy rangelands, grazing management is in compliance with NFMA and Forest Plan guidance to “insure that management practices do not adversely affect soil productivity” (16 U.S.C. 1600, 1976; Helena National Forest Plan, page II/26).

For sites where soil quality is currently not at levels desired for maintaining healthy rangelands, grazing management activities may be designed to comply with NFMA and Forest Plan soil guidance by prescribing “needed mitigating actions” (16 U.S.C. 1600, 1976; Helena National Forest Plan, page II/26) through monitoring and adaptive management actions.

Heritage, Affected Environment

Introduction

The National Historic Preservation Act (NHPA), as amended, and its implementing regulations at 36 CFR 800, provides the legal framework for considering cultural resources in project planning. NHPA Section 106 specifically requires that federal agencies take into account the potential effects of their actions on places and sites of archaeological and historical significance.

The Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, Executive Order 11593 (Protection and Enhancement of the Cultural Environment), and Executive Order 13007 (Indian Sacred Sites) also require federal agencies to actively identify, monitor, protect, and preserve cultural resources under their jurisdictions.

The area now encompassed by the Clancy allotment has likely been the scene of human activity for a very long time. Camps, tool stone quarries, trails and other archaeological sites in areas surrounding the Clancy allotment document use by American Indians for millennia. Many archaeological sites were undoubtedly disturbed or destroyed when the area was extensively hydraulic-mined from the 1860s to the turn of the 20th Century. More recently, rural development and subdivision have undoubtedly taken their toll on others. Thus, few archaeological sites are on record for this area. However, much of the area has not been inventoried for cultural resources.

Prehistory and History

Native American religious or cultural sites: No American Indian religious or cultural sites are currently identified in this allotment. The allotment area is not located within any ceded treaty lands. The Confederated Salish and Kootenai Tribes nor Blackfoot Tribe have not provided the Helena NF, either verbally or in writing, with specific concerns or comments relative to agency projects in the Clancy area.

The CU AMP project area is not located on any ceded treaty lands. The Confederated Salish and Kootenai Tribes and the Blackfoot Tribe are regularly informed of Helena NF projects. This consultation includes an annual pre-field season review of all forest projects and project-specific consultations with Tribal Historic Preservation Office (THPO) staff. The Helena NF Annual Heritage Resource Compliance Report, a requirement under a FS-SHPO programmatic agreement to comply with the National Historic Preservation Act, is also provided to tribes. In addition, NEPA analyses schedules and updates and individual project documents are provided to the tribes for review and comment at their discretion.

Archaeological/Historical Sites: The area now encompassed by the Clancy allotment has likely been the scene of human activity for a very long time. Camps, tool stone quarries, trails and other archaeological sites in areas surrounding the Clancy allotment document use by American Indians for millennia. Many archaeological sites were undoubtedly disturbed or destroyed when the area was extensively hydraulic-mined from the 1860s to the turn of the 20th Century. More recently, rural development and subdivision have undoubtedly taken their toll on others. Thus, few archaeological sites are on record for this area. However, much of the area has not been inventoried for cultural resources.

The allotment area is rich in historic cultural resources, ranging early wagon trails, to homesteads, to stone quarries, to Forest Service facilities and trails. Incorporating parts of three different historic mining districts, the allotment area is replete with old mining ruins in various states of deterioration. The preservation-value of many of these early historic ruins is highly variable. However, the conservation, stabilization, and interpretation of important ruins are historic preservation and tourism goals in Jefferson and Lewis and Clark Counties, and the greater Helena Valley area.

The Clancy allotment includes timber and grassland areas that were surveyed for the Kady Gulch Prescribed Burn (93-2-1) and Clancy-Unionville Vegetation and Travel Management Project (97-2-3; 99-2-2; 01-2-22). These previous large-scale surveys may give an incomplete picture of cultural resource potential in the Clancy allotment because they were largely focused on areas targeted for timber management, as opposed to areas more likely to contain cultural resources, such as riparian areas and meadows. In addition, a small number of inventories have been completed for livestock watering improvements within or near the Clancy allotment area, including the Bluebird and Upper Bluebird, Lucky Find, Lohr and Occidental Plateau water developments.

In 2008, a cultural resource survey was completed for the proposed Blizzard Basin water development near Montana Tunnels Mine within the Clancy allotment. Nothing of cultural significance was found in the project area. The project is documented in the 2008 HNF Annual Heritage Compliance Report to the Montana State Historic Preservation Office.

Two cultural resources—one prehistoric (24JF1613) and one historic (24LC1399) are currently on record for the Clancy allotment. However, there are a number of cultural resources in the area, especially mining ruins and features, which have not yet been recorded by HNF archaeologists.

Livestock grazing across the Helena National Forest, including the Clancy allotment has had an unquantifiable affect on cultural resources through the erosion and exposure of archaeological sites and artifacts, and the trampling and degradation of standing ruins such as historic log cabins. The deleterious effects of livestock grazing on archaeological and historic cultural resources is particularly apparent where cattle jug-up near streams, water developments, and shaded areas (or some combination thereof). Because these effects are difficult to quantify across an entire allotment, the forest has traditionally not addressed the issue of grazing writ large on cultural resources in its environmental analyses. However, as a result of active monitoring and adaptive management, in specific cases fencing and other measures may be necessary to prevent grazing livestock from damaging significant cultural resources.

Heritage, Environmental Consequences

Effects Common to All Alternatives

Natural and human agencies would continue to affect cultural resources within the Clancy grazing allotment whether or not grazing is allowed and at whatever livestock stocking numbers. Cultural resources would be both vulnerable to artifact collection and vandalism and exposed to inadvertent damage by the public (i.e., wood cutting, camping). Cultural resources would likewise continue to be threatened by wildfire, erosion, flooding, and other natural events.

Effects Common to Alternatives 1 and 2

The overall effects of livestock grazing on cultural resources across the Helena National Forest over the past 100 plus years, including within the Clancy grazing allotment, has not been assessed. Site-specific observations in individual range allotments clearly indicate that cattle trample archaeological sites and historic ruins, and either cause or accelerate erosion that exposes cultural resources (i.e., archaeological sites buried in creek bank sediment). Where cattle concentrate near streams, water developments, salt licks, wallows, and shaded areas (or some combination thereof), the deleterious effects of livestock on historic and archaeological sites, as well as the native vegetation and soils that frequently protect them, are particularly apparent.

Rangeland improvements, including fencing and water developments, also have the potential to adversely affect cultural resources. Fences can direct livestock atop or funnel them to cultural resources. Archaeological sites are frequently found around natural springs that are chosen for livestock water developments.

Under both Alternative 1 and 2, the following measures would be implemented to protect cultural resources to comply with NHPA Section 106:

- Range improvements, including water developments, fence lines, drive lanes, and salt licks, will not be placed atop currently identified cultural resources unless appropriate mitigation-protection measures have been implemented.
- Cultural resource field surveys will precede all ground-disturbing range projects unless the targeted area has been previously inventoried for range or other agency projects.
- Cultural resource monitoring will be conducted within the allotment area in conjunction with other resource monitoring. Adverse effects to cultural resources will be mitigated as appropriate.
- Cultural resources such as abandoned mine shafts, prospect pits, and waste rock dumps that pose threats to livestock and humans will be identified and addressed through appropriate administrative actions.

Measures to reduce or mitigate adverse effects to identified cultural resources include project abandonment, relocation, and re-design. Range improvements may proceed as planned when a project-affected cultural resource(s) is determined not to be archaeologically or historically significant by the Forest Archaeologist, per 36 CFR 60 and FSM 2363.2.

Alternative 1, No Action Current Management

Direct and Indirect Effects

The **No Action Alternative** will continue livestock grazing in the Clancy allotment at its current stocking level. Livestock improvements, including water developments (5), fencing (15 miles), and catchment dugouts will require maintenance, and potentially new ground-disturbance. Adaptive management may require additional range improvements, which will involve ground disturbance around, in some cases, culturally-sensitive areas such as natural springs. In view of this situation, this alternative has the most potential to adversely affect cultural resources.

Irreversible/Irretrievable Commitments

There are no irretrievable or irreversible commitments caused by this action related to cultural resources provided that the livestock numbers and distributions do not increase and that cultural resources are inventoried and potential impacts are appropriately mitigated in advance of any administratively approved rangeland improvements.

Cumulative Effects

Current allotment management would contribute to the number of agency-authorized projects that have, in concert with natural deterioration and events, lead to the gradual degradation of cultural resource within the allotment area over the years.

Alternative 2, Proposed Action

Direct and Indirect Effects

The Proposed Action will have less impact on cultural resources than the No Action Alternative but decidedly more impact than the No Grazing Alternative. Reduced stocking numbers and protecting riparian areas along Clancy Creek and the South Fork of Quartz Creek would benefit cultural resources because these are areas where cultural resources have either been identified (but not recorded) or are most likely to be found. Livestock improvements proposed through monitoring and adaptive management would be considered under a separate NEPA analysis. Still, regardless of the analysis method Irreversible/Irretrievable Commitments

There are no irretrievable or irreversible commitments to cultural resources caused by this alternative provided that the livestock stocking numbers and distributions do not increase and that cultural resources are inventoried, and potential impacts are considered and appropriately mitigated, in advance of any rangeland improvements.

Cumulative Effects

The Proposed Action would contribute to the number of agency-authorized projects that have, in concert with natural deterioration and events, lead to the gradual degradation of cultural resource within the allotment area over the years.

Alternative 3, No Grazing

Direct and Indirect Effects

The No Grazing Alternative will eliminate the direct (livestock improvements) and “indirect” (grazing) impacts to cultural resources. In view of this situation, this alternative has the least potential to adversely affect cultural resources of the three alternatives. It would benefit cultural resources in the Clancy area.

Irreversible/Irretrievable Commitments

There are no irretrievable or irreversible commitments caused by this action related to cultural resources.

Cumulative Effects

This alternative would have the least amount of cumulative effects on cultural resources since there would be no livestock in the project area.

Conclusions and Forest Plan Consistency

The number of identified cultural resources in the Clancy allotment is small, recognizing that the allotment has not been completely inventoried for cultural resources. Still, outside of a few favorable areas, the mountainous character the allotment suggests that the cultural resource potential is limited.

Alternative 1 (Current Management) has the potential to directly and indirectly affect two identified cultural resources and potentially others which have yet to be found and recorded. The effects of implementing rangeland improvement projects, as Forest Service authorized administrative actions responsive to permittee or resource needs, could be mitigated by the appropriate level of cultural resource survey, effects analysis, and mitigation. If this occurs, implementation of this alternative would have little to no adverse effect on cultural resources.

Alternative 2 (Proposed Action) also has the potential to directly and indirectly affect two currently identified cultural resources and potentially others which have yet to be found and recorded. This alternative would reduce livestock stocking numbers, which would be a benefit to cultural resources over Alternative 1. The effects of implementing rangeland improvements could be mitigated by the appropriate level of cultural resource survey, effects analysis, and mitigation. For this reason, the implementation of this alternative would have little to no adverse effect on cultural resources.

Alternative 3 (No Grazing) would have a beneficial effect on cultural resources. Cultural resources, which are usually fragile and always non-renewable, would no longer be subject to the various deleterious effects of livestock grazing, particularly around springs and in riparian areas and parklands where cultural resources are often located. Absent the need to monitor livestock grazing effects, cultural resources would likely be subject to less frequent condition assessments and the lack allotment activity would preclude opportunities to conduct NHPA Section 106 compliance surveys for cultural resources. As in the other alternatives, cultural resources would be vulnerable to other natural and human agencies.

The NHPA Section 106, and its implementing regulations at 36 CFR 800, requires review, field survey, and consultation preceding all potentially ground-disturbing projects that may affect cultural resources. Where disturbance to significant cultural resources is anticipated, these impacts may be reduced or eliminated through such mitigation measures as project abandonment, relocation and re-design. Range improvements may proceed as planned when a project-affected cultural resource(s) is determined by the Forest Archaeologist not to be significant, in accordance with NHPA and its implementing regulations at 36 CFR 60.

Routine cultural resource monitoring in the Clancy allotment may require that measures such as fencing be implemented to protect archaeologically- or historically significant cultural resources that are clearly being affected by livestock grazing, such as trampling of historic ruins and artifacts near springs by livestock.

The HNF Forest Plan (1986) requires the integration of cultural resources in project planning and forest management, including allotment management plan revision. To comply with federal legislation, forest plan standards include compliance inventory, evaluation of site significance, and project effect, consultation with the Montana State Historic Preservation Officer and tribes, and implementation of mitigation-treatment plans for cultural resources. Given these guidelines in the HNF Forest Plan, implementation of any alternative would meet forest plan standards.

Weeds, Affected Environment

Introduction

The Montana Weed Control Act was established in 1948 to protect Montana from destructive noxious weeds. This act, amended in 1991, has established a set of criteria for the control and management of noxious weeds in Montana. Noxious weeds are defined by this act as being any exotic plant species which may render land unfit for agriculture, forestry, livestock, wildlife, or other beneficial uses, or that may harm native plant communities. This analysis focuses on the species on the state noxious weed list and the Clancy grazing allotment boundary was used as the analysis area.

Livestock grazing can promote the spread of noxious weeds. However, current treatment activities have appeared to curtail significant weed infestation spread. Roadsides and small isolated patches have been treated on a rotational basis, reducing infestation sizes and potential spread. Inconsistent budgets, manpower, and a variety of tools available for use reduce the effectiveness of significant reductions in population sizes. The Montana State Wide plan and Best Management Practices (BMPs) currently are being implemented. In addition, private landowners, including permittees grazing on the Helena National Forest have been aggressively treating private lands to minimize the risk of weed seeds being transported from private land to the National Forest. Helena National Forest weed maps have been completed and are updated regularly to track treatment/control efforts and their effectiveness. The Final EIS Noxious Weed Treatment Project considers an aggressive management/treatment program utilizing all viable tools available to control and reduce noxious weeds.

Current weed control efforts and livestock management prescriptions have been compatible in previous years, evident by reduced weed infestation sizes. Noxious weed management has been identified as a high priority nationally, as well as, locally. Budgets appear to be stable and direction for noxious weed management continues to be emphasized. Therefore grazing on the Clancy allotment is expected to have no significant effect on weed spread, providing current/existing control efforts continue.

Noxious Weed Occurrence

Weeds have been expanding in the analysis area over the past several years. A variety of factors contributed to the spread of noxious weeds. Noxious weeds are invasive by definition, and are able to spread without natural enemies, pathogens etc. to keep them in check.

Within the Clancy allotment area approximately 65 acres are currently infested with the following noxious weeds: Canada thistle, musk thistle, spotted knapweed, hounds-tongue, dalmatian toadflax, common toadflax, and leafy spurge. The infestations are within the allotment, or in the immediate surroundings.

Noxious weeds are aggressive plants ecologically. There are seven noxious weed species of primary concern in terms of level of infestation in or adjacent to this area: spotted knapweed (*Centaurea maculosa*), houndstongue (*Cynoglossum officinale*), Canada thistle (*Cirsium arvense*), Dalmatian toadflax (*Linaria dalmatica*), Common toadflax (*Linaria vulgaris*) Leafy Spurge (*Euphorbia esula*) and Musk Thistle (*Carduus nutans*).

Spotted knapweed (*Centaurea maculosa*) thrives in open areas, with forest canopies of less than 20% closure. Spotted knapweed (*Centaurea maculosa*) spreads almost entirely by prolific seed production (FEIS, 2004a). This species has also been shown to have allelopathic properties, secreting toxins that suppress the growth of other plants, although resource competition is just as effective in its ability to dominate areas (FEIS 2004a).

Houndstongue, (*Cynoglossum officinale*), occupies a similar area as spotted knapweed and is common along roads and in logged areas. Houndstongue is particularly difficult to map due to the dispersed nature of the plants. Houndstongue is a biennial or short-lived perennial that reproduces only by seed. This species is spread by large seeds that attach to animals, humans, as well as dispersed by wind (FEIS, 2004c). Evidence from a study in British Columbia indicates that cattle are important dispersers of houndstongue seed, picking up about 65% of seeds per stalk in grazed paddocks. Houndstongue is relatively shade tolerant, although it thrives in full sunlight. There is potential for this species to spread in the area.

Canada thistle (*Cirsium arvense*) has been mapped on a smaller area as compared to spotted knapweed and houndstongue, This species spreads primarily by adventitious root buds that may form new adventitious shoots can develop along the root at any location (FEIS, 2004b). Canada thistle is present in the project area, generally associated with roadside disturbance or harvest disturbance. Its habitat is restricted to open areas of less than 10% canopy closure.

Dalmation toadflax (*Linaria dalmatica*) has been shown to readily establish on open and disturbed sites where competition from other plants is reduced (FEIS, 2004d). Dalmatian toadflax (*Linaria dalmatica*) seeds may be dispersed by cattle, deer and other browsing animals, and the seeds can remain viable after passing through the gastrointestinal tracts of cattle, and possibly deer. This species can also expand vegetatively by the formation of adventitious shoots from both the tap and lateral roots (FEIS, 2004d). Weeds are expected to increase in level of infestation and acres infested overall in the project area in spite of the efforts of herbicide application for control. Weed seeds are stored in the upper soil layers, and will germinate over several years.

Common toadflax (*Linaria vulgaris*) is most commonly found in cultivated fields, roadsides, railways, "waste areas", clearcuts, overgrazed pastures and rangeland, and in plant communities that are typically open or disturbed (FEIS 2009). Yellow toadflax has a variable habit, depending on environmental factors such as shading, grazing, or soil type. Extensive root systems allow toadflax plants to exploit water resources efficiently and provide an effective anchor that prevents grazing animals and cultivation methods from dislodging or destroying plants (FEIS 2009).

Leafy Spurge (*Euphorbia esula*) Leafy spurge displaces native vegetation in prairie habitats and fields through shading and by usurping available water and nutrients and through plant toxins that prevent the growth of other plants underneath it. Leafy spurge is an aggressive, persistent, deep-rooted perennial, growing to a height of 3 feet or taller. Leafy spurge reproduces by vegetative re-growth from spreading roots and by the production of large quantities of seeds that are often dispersed by birds, wildlife, humans, and in rivers and streams. The presence of leafy spurge influences foraging behavior of cattle. Cattle prefer foraging in areas without heavy infestations (FEIS 2009).

Noxious weeds can create monocultures if uncontrolled with herbicides or effective biocontrol. The loss of plant biodiversity, soil productivity and foraging values are great (Pauchard et al., 2003; FEIS, 2004a; FEIS, 2004b; FEIS, 2004c; FEIS, 2004d, FEIS 2009). The effects of noxious weed infestations are adverse to native fauna and flora and present the greatest large-scale threat to native ecosystems that exist in the Nations wild lands today (Lodge and Shrader, 2001; Pauchard et al., 2003).

Noxious Weed Treatment

Various methods of weed control are used. Herbicide application is the most common form of control used in the project area. The Helena National Forest Weed EIS (USDA 2006) provides guidance and environmental requirements for weed control activities, which would be applied to this area in any action alternative.

Weeds, Environmental Consequences

Introduction

Noxious weeds alter the structure, organization, and function of ecological systems (Olson 1999), including soil, plant, and animal relationships (Randall 2000) Soil in areas dominated by noxious weeds typically have lower amounts of organic matter and available nitrogen than other areas supporting native grassland communities. Runoff and sediment yield are typically higher on sites infested with noxious weeds as compared to healthy native bunchgrass communities. Non-native plants threaten the biodiversity of native plant communities and can alter the ecosystem process.

Weeds spread aggressively and the most effective time to treat new infestations or new species is when they are discovered. An Adaptive Management Strategy (AMS) described in the Forest-wide EIS has been included to address new areas of infestation, new weed species discovered or listed, and new weed treatment methods becoming available (herbicides, biocontrol, and cost effective mechanical methods).

Effects Common to All Alternatives

Weed management would continue as in the past. Chemical weed treatments would be used in areas accessible to ground spraying equipment. Backpack and horse pack spraying would be used in areas suitable for this type of equipment and bio-control would be used in areas inaccessible to motorized equipment or in areas where the biological agents had optimal conditions for survival and expansion. In riparian areas biological control would be emphasized where conditions for insect establishment are met.

Irreversible/Irretrievable Commitments

At high infestation levels the effects of noxious weed infestations can be both irretrievable and irreversible. There is the constant potential for adverse effects if weeds are untreated and allowed to spread over time. The effects would be limited to a relatively small area initially and would be occurring with or without livestock grazing as weeds are established in the area. Appropriate treatment measures are outlined in the Final Environmental Impact Statement Noxious Weed Treatment Project. If these measures are applied to the weed infestations in the Clancy allotment, the impacts from noxious weeds due to any cause, including livestock grazing, would be limited.

Effects Common to Alternatives 1 and 2

The continuation of livestock grazing would continue to create the environment and vector for increasing weed populations. This effect would be reduced through weed control efforts. Areas of known weed infestation would be monitored and treated as appropriate, in accordance with the Final Environmental Impact Statement Noxious Weed Treatment Projects (USDA, 2006). Chemical weed treatments would be used in areas accessible to ground spraying equipment. Backpack and horse pack spraying would be used in areas suitable for this type of equipment and bio-control would be used in areas inaccessible to motorized equipment or in areas where the biological agents had optimal conditions for survival and expansion. In riparian areas biological control would be emphasized where conditions for insect establishment are met.

The following mitigation measures are required for range activities, per FSM 2080 (2001):

- (1) Ensure weed prevention and control are considered in management of all grazing allotments.
 - (a) Include weed risk assessment in environmental analysis for rangeland projects.
 - (b) When other plans do not already address noxious weeds, include practices and control measures in Annual Operating Instructions.
- (2) Minimize ground disturbance and bare soil.
 - (a) Revegetate, where applicable, bare soil from grazing activities according to items (3) (a), (b), and (c) below.
 - (b) Check areas of concentrated livestock use for weed establishment and treat new infestations.
- (3) Minimize transport of weed seed into and within allotments.

- (a) Remove all mud, dirt, and plant parts from all off road equipment before moving into project area. Cleaning must occur off National Forest lands. (This does not apply to service vehicles that will stay on the roadway, traveling frequently in and out of the project area.)
- (b) Clean all equipment prior to leaving the project site, if operating in areas infested with new invaders (as determined by the Forest Weed Specialist).
- (c) Straw used for road stabilization and erosion control would be certified weed-free or weed-seed-free.

Each of the above measures would be reviewed prior to any ground disturbing activity to insure the mitigation is being met. Fence construction, water development or cattle guard replacement activities would incorporate the above mitigation as appropriate.

Annual utilization monitoring would locate areas that cattle are grazing too heavily. Cattle would be discouraged from overgrazing site specific areas through proper salting, riding and removal from overgrazed areas.

Alternative 1, No Action - Current Management

Direct and Indirect Effects

Livestock grazing serves as a mechanism to spread existing weeds to un-infested areas. Isolated patches occur within the proposed grazing project area. Noxious weed treatment has been ongoing and patch size appears to be reducing. Annual monitoring identifies new infestations/patches needing treatment. The Clancy allotment is proposed to remain actively grazed under the Clancy AMP supports approximately 65 acres of noxious weeds.

Reconstruction of fences for better livestock control and appropriate cattle management practices would decrease the likelihood of grazing to spread weeds. The proposed mitigation would also decrease the impact of livestock grazing.

Cumulative Effects

The spread of weeds by livestock is additive to the spread of noxious weeds by other sources, such as, travel on roads, wildfire, timber harvest, road construction and wildlife.

Alternative 2, Proposed Action

Direct and Indirect Effects

The effects discussed in Alternative 1 also apply to Alternative 2. The amount of disturbance related to concentrated cattle use would be decreased slightly from Alternative 1.

Cumulative Effects

The spread of weeds by livestock is additive to the spread of noxious weeds by other sources, such as, travel on roads, wildfire, timber harvest, road construction and wildlife.

Alternative 3, No Grazing

Direct and Indirect Effects

The removal of cattle from this allotment would reduce or eliminate impacts caused by cattle grazing. Concentrated use areas and weed spread related to livestock would not occur. Weed infestations would remain in place, and if left untreated, would spread even without livestock grazing, although at a lower rate than would occur with livestock grazing.

Cumulative Effects

The spread of noxious weeds by other sources, such as, travel on roads, wildfire, timber harvest, road construction, and wildlife would continue.

Conclusions

Alternative 1, the current management, has the highest level of soil disturbing activities with the highest level of risk in the short term for weed invasion. Implementing the BMPs for weed control would move the area towards meeting Forest Plan Standards for weed control.

Alternative 2, the Proposed Action, would have a slightly lower risk of weed invasion than Alternative 1 due to a lower amount of soil disturbance. Implementing the BMPs for weed control would move the area towards meeting Forest Plan Standards for weed control.

Alternative 3, the No Grazing alternative, would have no new soil disturbing activities that tend to increase weed invasion.

The HNF Forest Plan (1986) outlines noxious weed management objectives and control measures on forest system lands through an integrated weed control programs and integrated pest management. Chemical, biological, and mechanical methods will be the principal control methods. Herbicide application is the most common form of control used in the project area.

All current weed treatments and proposed changes to allotment management are consistent with the following laws and regulations:

- The Plant Protection Act (7 U.S.C. 104 § 7702, 2000).
- Montana Weed Control Act (7 *Montana Code* 22 §§ 2101 et seq., 2003)
- Federal Noxious Weed Act of 1974, section 2814 as amended (7 U.S.C. 61 § 2814, 1990)
- The National Forest Management Act (1976) under 36 CFR 219.20 and CFR 219.20(a)(1)
- Forest Service Manual 2080 (USDA 2001) Supplement R1 2000-2001-1.
- The Helena National Forest Noxious Weed Vegetation Treatment Environmental Impact Statement (USDA, 2006)
- The Helena National Forest Plan (USDA, 1986): Page II/22.

Recreation, Affected Environment

Introduction

Motorized travel to hunt, view scenery, and view wildlife is popular in the drainages south and west of Helena. Many types of off-highway vehicles (OHV) are used, including ATVs, trail bikes, snowmobiles and 4-wheel drive vehicles. Due to lack of access and current travel restrictions, motorized recreation is somewhat limited. Areas that are currently popular for motorized recreation include the Lava Mountain OHV Trail and the North and South of Quartz Creek.

The Lava Mountain Trail # 244 crosses seven miles of National forest land. This motorized trail was constructed with funds generated by a partnership with the Rocky Mountain Trail Bike Riders and the Montana Department of Fish, Wildlife and Parks. This trail accesses the Deerlodge National Forest and OHV opportunities in Cataract Basin southwest of the analysis area.

Most recreational activity in the area is classified as dispersed; meaning it occurs outside of campgrounds and other constructed recreational facilities. This would include, but not be limited to camping, hiking, fishing, horseback riding, and riding Off Highway Vehicles. Public use of the area primarily occurs from April through November, with most of the recreational activity taking place during evenings and weekends. Livestock/recreation conflicts, such as cows in dispersed camping areas or on trails are not common on this

allotment. From visitor contacts and results of the National Visitor monitoring it appears that most visitors are local or nearby residents.

Scenery Management

Visually this area has many scenic vistas you can see the peaks of mountains and park/meadow sites. The scenic value is the highest value in regard to scenery management.

Alternative 1, No Action - Current Management

Current management under the 1988 Clancy allotment AMP would continue. The cattle numbers of 284 pairs for a season of June 25 to September 30 could be permitted to graze will continue to graze this allotment. Current improvements on National Forest would require maintenance. This includes 15 miles of fence, and five spring developments. No change in grazing management, will allow poor sites (insufficient ground cover and lack of desired vegetation) to continue and provide a higher probability of noxious weed infestation.

Alternative 2, Proposed Action

Improved livestock distribution and improved riparian conditions, would have a positive effect on recreation in the analysis area. Vegetative conditions would improve but at a slower rate than Alternative 3 and the potential of livestock conflicts with recreationists would be reduced but not eliminated.

Alternative 3, No Grazing

The removal of livestock and associated range improvements would, over time move the riparian and upland vegetation to a more natural condition and would eliminate potential livestock/recreation conflicts. Camping, hiking, biking, and hunting would all be somewhat improved by the removal of livestock and the changes in vegetation that would be beneficial to wildlife and fisheries.

Past, Present and Foreseeable Actions

The foreseeable event which would affect the area would be the implementation of the Clancy/Unionville Vegetation project (currently under litigation).

Recreation Environmental Consequences

Alternative 1, No Action - Current Management

Current activities will remain as described in the Affected Environment.

Alternative 2, Proposed Action

The reduction in cattle numbers, exclusion of grazing in some areas along with the changes in timing would have a positive effect on recreation in the analysis area. Vegetative conditions would improve but at a slower rate than Alternative 2 and the potential of livestock conflicts with recreationists would be reduced but not eliminated.

Alternative 3, No Grazing

The removal of livestock and associated range improvements would, over time move the riparian and upland vegetation to a more natural condition and would eliminate potential livestock/recreation conflicts. Most people would prefer to recreate in areas that are free from livestock and their associated impacts such as manure and flies that are common in areas that have concentrated livestock use. Camping, hiking, biking, and hunting would all be somewhat improved by the removal of livestock and the changes in vegetation that would be beneficial to wildlife and fisheries.

Conclusions and Forest Plan Consistency

Management Areas within the Clancy allotment are L-1, L-2, M-1, T-1, T-5, and W-1. Alternative 2, the Proposed Action is consistent with the recreation Management Standards for those Management Areas.

Sensitive Plants, Affected Environment

Introduction

Sensitive species in the Northern Region of the Forest Service are those plant and animal species identified by the Regional Forester for which population viability is a concern. Viability concern is evidenced by: 1) significant current or predicted downward trends in population numbers or density; 2) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution (Reel et al. 1989). The Helena National Forest has known or suspected occurrences of 24 species of sensitive plants. A complete list of the species and a description of habitat associated with those species can be found in Appendix A.

There are a total of 20 sensitive plant species known or suspected to exist on the Helena National Forest (Northern Region Sensitive Species List, 11/04/2004). The 2004 Sensitive Species list includes *Cirsium longistylum*, but this species was removed from the Sensitive Species list per a Regional Forester letter of 11/24/2004. The likelihood of occurrence of a given species within the project area and status is listed below.

The Clancy allotment area was used as the basic analysis area. Field surveys within the allotment and information from plant surveys in adjacent areas in the Clancy area was used to determine areas that would be more likely to support sensitive plant populations.

Threatened and Endangered Species

No federally listed plant species are known to occur in the Helena National Forest. A list of threatened, endangered and candidate species provided by the U.S. Fish and Wildlife Service in July 2007 identified no plant species for the Forest, nor did it identify any experimental nonessential populations or critical habitat (USDI Fish & Wildlife Service 2007).

Sensitive Species

There are a total of 20 sensitive plant species known or suspected to exist on the Helena National Forest (Northern Region Sensitive Species List, 11/04/2004). The 2004 Sensitive Species list includes *Cirsium longistylum*, but this species was removed from the Sensitive Species list per a Regional Forester letter of 11/24/2004 (Appendix B). The likelihood of occurrence of a given species within the project area and status is listed below.

This evaluation addresses 20 plant species identified by the Regional Forester as "sensitive" in the Northern Region (USDA Forest Service 2004).

Botrychium paradoxum is the only sensitive species known from the Clancy allotment. Three other sensitive species could occupy habitat within the allotment are known from the Divide landscape (Barton and Crispin, 2002; Montana Natural Heritage website www.mtnhp.gov). : *Botrychium crenulatum*, *Juncus hallii*, and *Phlox kelseyi* var. *missoulensis* are known to exist to the north and west of the project area. *Juncus hallii* has three populations Forest-wide. Two populations occur in the Divide landscape west of the allotment. This species is not known to occupy habitat within the project area and was not found during ground reconnaissance (Olsen pers obs. 2005) or in past surveys (Barton and Crispin 2002). *Phlox kelseyi* var. *missoulensis* (8 populations on the Helena NF—three new populations were found summer 2008) has been found in the MacDonald Pass area and north. It is also known from the Elkhorns and Big Belts. This species is not known to occupy habitat within the project area and was not found during ground reconnaissance (Olsen pers obs. 2005) or in past surveys (Barton and Crispin 2002). It is possible that *Botrychium crenulatum* (known from the Beaverhead-Deerlodge just south of the Helena boundary in this area) occurs here. This species was not found in ground reconnaissance of

the project area (Olsen, pers obs. 2005) or in past surveys of the area (Barton and Crispin 2002). Grazing impacts to *B. crenulatum* would be similar to those on *B. paradoxum*.

Sensitive Plants, Environmental Consequences

Alternative 1, No Action – Current Management

Direct and Indirect Effects

Livestock grazing would continue throughout the grazing allotments similarly to the current management. The current situation has not affected known sensitive plant populations in an adverse manner. No adverse effects would be expected to affect any sensitive plant populations.

Irreversible/Irretrievable Commitments

There are no irretrievable or irreversible commitments caused by this action related to sensitive plant populations as long as cattle distribution does not change.

Cumulative Effects

Numerous populations of *Botrychium paradoxum* and several populations of *Botrychium crenulatum* occur on the Beaverhead-Deerlodge National Forest adjacent to the Clancy allotment. The grazing system is not expected to change on the Beaverhead Deerlodge in this area and no adverse effects would be expected to occur to the populations. The High Ore rehabilitation and salvage activities are not in the area of the sensitive species.

The Bluebird and Salvai mines are proposed for reclamation. There are no known sensitive plant populations or potential habitat in the immediate vicinity of these mines. These are old tailings piles and acid-mine drainage areas so plant populations would be very unlikely to occur here. New road construction associated with hauling, and adjacent area disturbance would affect any populations. These projects will be surveyed prior to any activity within the Federal lands, and if any plants are found they will be protected.

Weed control with herbicides can be very detrimental to sensitive plant populations. The Natural Heritage Program recently surveyed potential sensitive plant habitat within and adjacent to known noxious weed infestations on National Forest land in this area (Barton and Crispin, 2002), and no sensitive plant populations were found. No noxious weeds have been found in the area where the sensitive plant populations occur.

Private land activities such as subdivisions in Clancy, logging and ongoing grazing and recreation have the potential to affect sensitive plant populations, although no known populations occur. Potential habitat for sensitive plants as described in this document likely occurs on private land adjacent to the National Forest. It is possible that plant populations could be affected by ground disturbing activities associated with logging and subdivision development. Cattle grazing is less likely to affect the sensitive species addressed in this document, although continuous heavy grazing for years could reduce populations. Recreation activities such as off road motorized use and mountain biking could affect plant populations, particularly through the spread of noxious weeds.

Montana Tunnels mining operations are expanding to the Forest boundary. The ground disturbance and acid-mine drainage associated with mining has a long-term adverse impact on plants in general, and would certainly impact sensitive species if any populations were in the area. No known populations exist in this area.

Alternative 2- The Proposed Action

Direct and Indirect

Livestock grazing would continue throughout the grazing allotment at a lower level overall than the current management. The current situation has not affected known sensitive plant populations in an adverse manner. No adverse effects would be expected to affect any sensitive plant populations with the proposed action. No effect would occur within the mesic forests of the area as these habitats are not heavily impacted by livestock.

Using adaptive management allows land managers to adjust to climatic changes such as drought. This would be beneficial to sensitive plants to ensure that grazing practices would not change in the Occidental Plateau area of the Clancy allotment. There are no known sensitive plant populations in any of the other allotments. There would be no impact to sensitive plant species from this alternative. A beneficial effect to the overall health, productivity, and diversity of the grass and shrublands would occur from improving grazing practices, as well as sensitive areas such as riparian zones. Employing adaptive management strategies would enable the Forest to react to situations that could cause an adverse effect.

Irreversible/Irretrievable Commitments

There are no irretrievable or irreversible commitments caused by this action related to sensitive plant populations.

Cumulative Effects

Cumulative effects are similar to those found under the No Action Alternative.

Alternative 3 – No Grazing

Direct and Indirect Effects

No sensitive plant populations have been found in the analysis area. It is possible that livestock grazing may impact individuals but would not contribute toward a trend for federal listing or loss of viability.

Irreversible/Irretrievable Commitments

There are no irretrievable or irreversible commitments caused by this action related to sensitive plant populations.

Cumulative Effects

Cumulative effects are similar to those found under the No Action Alternative.

1. SPECIES- *Botrychium paradoxum*:

Direct, Indirect, and Cumulative Effects of Proposed Actions

This plant is found on the Occidental Plateau (Montana Natural Heritage website www.mtnhp.gov, Olsen personal knowledge) in the Project area. This population is viable. Without livestock grazing the population would continue to remain viable.

Determination

The decision **may impact individuals but would not contribute toward a trend for federal listing or loss of viability** because no adverse impacts would be expected to occur.

2. SPECIES- *Botrychium cenulatum*

Direct, Indirect, and Cumulative Effects of Proposed Actions

This species is known from the Beaverhead-Deerlodge to the south of this analysis area. This species has not been found on the Helena National Forest to date. Without livestock grazing any populations in the area would remain viable.

Determination

The decision **may impact individuals but would not contribute toward a trend for federal listing or loss of viability** because no adverse impacts would be expected to occur

3. SPECIES- *Juncus hallii*

Direct, Indirect, and Cumulative Effects of Proposed Actions

This plant is known from the Divide landscape in an area that is west and north of the Clancy Creek allotment area. This species has not been found in the project area in past surveys. Without livestock grazing any populations in the area would remain viable.

Determination

The decision **may impact individuals but would not contribute toward a trend for federal listing or loss of viability** because no populations have been found in the project area.

4. SPECIES- *Phlox kelseyi* var. *missoulensis*

Direct, Indirect, and Cumulative Effects of Proposed Actions

This plant is known from the Divide landscape in several areas to the west and north of the Clancy Creek allotment project area. This species has not been found in the project area. Without livestock grazing any populations in the area would remain viable.

Determination

The decision **may impact individuals but would not contribute toward a trend for federal listing or loss of viability** because no adverse impacts would be expected to occur

Conclusions and Forest Plan Consistency

Regional direction in 2004 updated the Forest's sensitive species list. None of the 20 species listed for the Helena National Forest, have been found during ground reconnaissance and past surveys (Olsen, pers obs. 2005, Poole and Heidel 1993, Barton and Crispin 2002).

Based on this analysis, implementation of Alternative 1, 2, or 3 results in a determination of "may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or cause a loss of viability" for *Botrychium paradoxum*, *Goodyera repens*, *Juncus hallii*, *Polygonum douglassii* spp. *austinae* and *Phlox kelseyi* var. *missoulensis*.