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**Upper Big Hole Land Health
Environmental Assessment**

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North Fork Big Hole River, Summer 2009

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Table of Contents

| | | |
|---|--|----------|
| List of Tables | | iii |
| 1.0 | | P |
| PURPOSE AND NEED FOR THE PROPOSED ACTION | | 1 |
| 1.1 Introduction..... | | 1 |
| 1.2 Background..... | | 1 |
| 1.3 Need for the Proposed Action..... | | 2 |
| 1.4 Purpose of the Proposed Action..... | | 4 |
| 1.5 Conformance With BLM Land Use Plans | | 4 |
| 1.6 Relationship to Statutes, Regulations, or other Plans | | 4 |
| 1.7 Unique Characteristics of the Geographic Area | | 5 |
| 1.8 Identification of Issues, Resource Concerns and Objectives | | 5 |
| 1.9 Summary | | 9 |
| 2.0 DECIPTION OF ALTERNATIVES | | 10 |
| 2.1 Introduction..... | | 10 |
| 2.2 Process Used to Formulate Alternatives | | 10 |
| 2.3 Alternatives Considered but Eliminated from Further Analysis..... | | 10 |
| 2.4 Features Common to All Alternatives | | 12 |
| 2.5 Alternative A – No Action..... | | 14 |
| 2.6 Features Common to All Action Alternatives | | 15 |
| 2.7 Alternative B..... | | 20 |
| 2.7.1 Livestock Grazing..... | | 20 |
| 2.7.2 Forest and Woodland Health Treatments | | 24 |
| 2.8 Alternative C..... | | 26 |
| 2.7.1 Livestock Grazing..... | | 26 |
| 2.7.2 Forest and Woodland Health Treatments | | 29 |
| 2.9 Summary Comparison of Alternative Actions..... | | 31 |
| 3.0 AFFECTED ENVIRONMENT | | 34 |
| 3.1 Introduction..... | | 34 |
| 3.2 General Setting..... | | 34 |
| 3.3 Key Issues Brought Forward for Analysis..... | | 35 |
| 3.3.1 Issue 1: Riparian, Wetland, and Aquatic Habitat..... | | 35 |
| 3.3.2 Issue 2: Forest and Woodland Habitat | | 38 |
| 3.4 Resource Concerns Brought Forward for Analysis | | 42 |
| 3.4.1 Resource Concern 1: Sagebrush Steppe Habitat..... | | 42 |
| 3.4.2 Resource Concern 2: Special Status Species | | 42 |
| 3.4.3 Resource Concern 3: Socioeconomics..... | | 43 |
| 3.4.4 Resource Concern 4: Travel Management..... | | 43 |
| 3.5 Description of Relevant Non-Affected Resources..... | | 43 |
| 3.5.1 Cultural Resources | | 43 |
| 3.5.2 Special Status Plant and Wildlife Species | | 44 |
| 3.5.3 Noxious Weeds | | 45 |
| 3.5.4 Air Quality | | 46 |

| | | |
|------------|--|-----------|
| 3.5.5 | Recreational Opportunities and Public Access..... | 46 |
| 4.0 | ENVIRONMENTAL IMPACTS..... | 47 |
| 4.1 | Introduction..... | 47 |
| 4.2 | Predicted Effects of Alternatives | 47 |
| 4.2.1 | Predicted Effects Common to All Alternatives | 47 |
| 4.2.2 | Alternative A - No Action..... | 51 |
| 4.2.3 | Predicted Effects Common to All Action Alternatives..... | 54 |
| 4.2.4 | Predicted Effects of Each Action Alternative (B and C) by Grazing Allotment | 62 |
| 4.2.5 | Predicted Effects of Each Action Alternative (B and C) by Forest Treatment Unit | 67 |
| 4.3 | Cumulative Effects for All Alternatives | 72 |
| 4.3.1 | Past and Present Actions..... | 72 |
| 4.3.2 | Reasonably Foreseeable Action Scenario (RFAS) | 74 |
| 4.3.3 | Cumulative Effects of Alternative A – No Action..... | 75 |
| 4.3.4 | Cumulative Effects of All Action Alternatives..... | 76 |
| 4.3.5 | Cumulative Effects of Alternative B..... | 77 |
| 4.3.6 | Cumulative Effects of Alternative C..... | 77 |
| 5.0 | CONSULTATION AND COORDINATION..... | 78 |
| 5.1 | List of Preparers..... | 78 |
| 5.2 | Consultation/Coordination..... | 78 |
| 5.2.1 | Persons and Agencies Consulted | 78 |
| 5.2.2 | Notifications..... | 79 |
| 5.2.3 | Statement of Public Interest..... | 79 |
| | GLOSSARY OF TERMS..... | 80 |
| | REFERENCES..... | 84 |
| | APPENDICIES | |
| | Appendix A – Maps | |
| | Appendix B – Upper Big Hole Watershed Monitoring Plan | |
| | Appendix C - Sensitive Plant Species and Wildlife Species Biological Evaluations | |

List of Tables

| Table | Page |
|---|------|
| 1.1 Land Health Summary by BLM Management Unit | 3 |
| 1.2 Unique Characteristics of the Geographic Area | 5 |
| 2.1 Livestock Grazing Allocation and Management within the UBHW | 14 |
| 2.2 Proposed Authorized Livestock Use for Big Swamp – Alternative B..... | 20 |
| 2.3 Proposed Rotation on the Big Swamp Allotment with 80 cow/calf pairs | 20 |
| 2.4 Proposed Rotation on the Big Swamp Allotment with 40 cow/calf pairs | 20 |
| 2.5 Proposed Authorized Use for Big Swamp Creek – Alternative B..... | 21 |
| 2.6 Proposed Authorized Use for Mussigbrod – Alternative B..... | 21 |
| 2.7 Authorized Use for North Fork Big Hole – Alternative B..... | 22 |
| 2.8 Proposed Authorized Use for Steel Creek – Alternative B..... | 22 |
| 2.9 Proposed Authorized Use for Warm Springs – Alternative B..... | 23 |
| 2.10 Warm Springs Allotment Proposed Pasture Rotation- Alternative B..... | 23 |
| 2.11 Forest and Woodland Habitat Treatments, Alternative B..... | 24 |
| 2.12 Proposed Roads, Alternative B | 25 |
| 2.13 Proposed Authorized Use for Big Swamp – Alternative C | 26 |
| 2.14 Proposed Rotation on the Big Swamp Allotment with 80 cow/calf pairs | 26 |
| 2.15 Proposed Rotation on the Big Swamp Allotment with 40 cow/calf pairs | 26 |
| 2.16 Proposed Authorized Use for Big Swamp Creek – Alternative C..... | 27 |
| 2.17 Proposed Rotation on Big Swamp Creek with 150 cow/calf pairs | 27 |
| 2.18 Proposed Rotation on Big Swamp Creek with 500 cow/calf pairs | 27 |
| 2.19 Proposed Authorized Use for Mussigbrod – Alternative C | 28 |
| 2.20 Proposed Authorized Use for Steel Creek – Alternative C..... | 28 |
| 2.21 Forest and Woodland Habitat Treatments, Alternative C..... | 30 |
| 2.22 Roads, Alternative C..... | 31 |
| 2.23 Summary Comparison of Alternatives by BLM Management Unit..... | 31 |
| 4.1 Summary of Proposed Projects on All Grazing Allotments by Alternative | 61 |

**Upper Big Hole Land Health
Environmental Assessment
DOI-BLM-MT-B050-2010-10-EA**

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

This Environmental Assessment (EA) has been prepared to disclose and analyze the environmental consequences of improving land health and enhancing habitat conditions on public lands administered by the Bureau of Land Management (BLM) within the Upper Big Hole River Watershed (UBHW). This EA analyzes livestock grazing management revisions in addition to analyzing proposals to address forest and woodland habitat, travel management, and fish and wildlife resources.

The EA is a site-specific analysis of potential impacts that could result with the implementation of a proposed action or alternatives to the proposed action. The EA assists the BLM in project planning and ensuring compliance with the National Environmental Policy Act (NEPA), and in making a determination as to whether any “significant” impacts could result from the analyzed actions. “Significance” is defined by NEPA and is found in regulation 40 CFR 1508.27. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of “Finding of No Significant Impact” (FONSI). If the decision maker determines that this project has “significant” impacts following the analysis in the EA, then an EIS would be prepared for the project. If not, a Decision Record may be signed for the EA approving the selected alternative. A Decision Record (DR), including a FONSI statement, documents the reasons why implementation of the selected alternative would not result in “significant” environmental impacts (effects) beyond those already addressed in the Dillon Resource Management Plan (RMP) approved on February 7, 2006.

1.2 Background

The BLM Dillon Field Office completed an interdisciplinary watershed assessment assessing the existing resource conditions on all BLM administered lands in the UBHW in 2009. Twelve BLM grazing allotments and five additional tracts of BLM administered land totaling just over 6300 acres were assessed to determine whether or not the five Standards for Rangeland Health are being met. The five standards for rangeland health that apply to public lands in the Dillon Field Office are presented below:

- Standard #1: Uplands are in proper functioning condition.
- Standard #2: Riparian and wetland areas are in proper functioning condition.
- Standard #3: Water quality meets State standards.
- Standard #4: Air quality meets State standards.
- Standard #5: Provide habitat as necessary, to maintain a viable and diverse population of native plant and animal species, including special status species.

Findings are presented in the *Upper Big Hole River Watershed Assessment Report* and the *Executive Summary and Authorized Officer's Determination*. Both of these documents may be reviewed at the Dillon Field Office, or on the internet at http://www.blm.gov/mt/st/en/fo/dillon_field_office.html.

1.3 Need for the Proposed Action

The Fundamentals of Rangeland Health and subsequent Land Health Standards require the BLM to initiate management actions that ensure, “Watersheds are in, or are making significant progress toward, properly functioning condition, including their upland, riparian-wetland, and aquatic components...” (43 CFR 4180.1 (a)), if an assessment determines one or more of the Land Health Standards are not being met. In the UBHW Assessment Report, BLM’s interdisciplinary (ID) team described several causal factors combining to negatively impact the biological, physiological, and ecological processes within BLM administered land in the watershed. As a result, the Authorized Officer determined that one or more of the Standards are not being met on six allotments (1,485 acres) and one unallotted tract (40 acres).

Table 1.1 summarizes the determination of rangeland health standards by BLM management unit. As required by 43CFR 4180 the table also discloses if existing grazing management practices or levels of grazing use on public lands are significant contributing factors in failing to achieve the Standards for Rangeland Health and conform with the eleven guidelines for livestock grazing management established for BLM lands in Western Montana.

Table 1.1 Land Health Summary by BLM Management Unit

| Allotment Name & Number | Are Rangeland Health Standards Being Met? | | | | | Significant Factors in Failing to Achieve Standards |
|--|---|----------|---------------------------|---------------|------------------|--|
| | Uplands | Wetlands | Riparian Areas & Wetlands | Water Quality | Air Quality | |
| Big Swamp #10141 | n/h | NO | 1 | YES | NO | Existing grazing management; Reduced beaver activity, Irrigation diversions; Historic drainage ditches |
| Big Swamp Creek #20715 | n/h | NO | 1 | YES | NO | Existing grazing management; Reduced beaver activity, Irrigation diversions; Historic drainage ditches |
| Doolittle Tracts #20196 | YES | YES | No ² | YES | YES | Big Hole River, BLM management not a factor |
| Dry Creek #20104 | YES | YES | 1 | YES | YES ³ | None |
| Foxtail #30616 | YES | YES | 1 | YES | YES ³ | None |
| Jumbo Mountain #20721 | YES | YES | No ² | YES | YES ³ | Rock Creek, BLM management not a factor |
| Moose Horn #00142 | YES | YES | 1 | YES | YES ³ | None |
| Mussigbrod On & Off #20705 | YES | NO | 1 | YES | NO | Existing grazing management |
| North Fork Big Hole #10742 | YES | NO | No ² | YES | NO ³ | Existing grazing management; Irrigation diversions; Historic drainage ditches |
| Steel Creek #10743 | YES | NO | 1 | YES | YES ³ | Existing grazing management |
| Warm Springs #20596 | YES | NO | No ² | YES | NO ³ | Existing grazing management; Reduced beaver activity; Non-native species |
| Wildwood Individual #30250 | YES | YES | 1 | YES | YES ³ | None |
| Unallotted Parcels | / / / / / / | | | | | |
| Fox Gulch - Unleased | YES | YES | 1 | YES | YES ³ | None |
| Swamp Creek - Unavailable | NO | NO | 1 | YES | NO | Existing grazing management; Irrigation diversions; Noxious weeds |
| Dry Creek - Unavailable | YES | n/h | n/a | YES | YES ³ | None |
| Miner Creek - Unavailable | YES | n/h | n/a | YES | YES ³ | None |
| Inabnit Butte - Unavailable | YES | n/h | n/a | YES | YES | None |
| n/h - Negligible or no habitat present in management unit n/a - Not applicable ¹ Tributary streams in the UBHW are not on the 303(d) list, are not priority streams, and are not scheduled to be evaluated by the DEQ. ² The Montana Department of Environmental Quality (DEQ) has the responsibility for making water quality determinations and has completed its evaluation of 303(d)-listed streams. Upper Big Hole River, North Fork of Big Hole River, Rock Creek and Warm Springs Creek flow through BLM administered land, have been evaluated by Montana Department of Environmental Quality (DEQ) and beneficial use support determinations have been completed. ³ Forest Health Concerns noted, see Assessment Report. | | | | | | |

1.4 Purpose(s) of the Proposed Action

The BLM Dillon Field Office proposes to improve land health and enhance habitat conditions on public lands within the UBHW. BLM also proposes to renew Term Grazing Leases on 12 grazing allotments within the watershed. Land health would be improved on public lands within the watershed by:

- Restoring/maintaining riparian, wetland and aquatic habitats (vegetation composition, structure, streambank stability, channel morphology) through revised livestock grazing management, structural projects, vegetative treatments.
- Restoring and/or maintaining historic density, structure, and species composition of forest and woodland habitats through mechanical treatments and prescribed fire.
- Maintaining upland health and sagebrush habitats (species composition and structure) through existing and/or revised livestock grazing management, structural projects, and vegetative treatments.
- Revising designations of wheeled motorized vehicle routes to correct mapping errors and address resource concerns while maintaining or improving existing levels of public access to public lands.

1.5 Conformance with BLM Land Use Plan(s)

The public lands in the UBHW are managed according to decisions in the Dillon RMP approved in 2006. The proposed action is in conformance with the RMP and applicable guidance is in the Record of Decision and Approved Dillon RMP on pages 24 - 74. The Dillon RMP can be accessed using the internet at http://www.blm.gov/mt/st/en/fo/dillon_field_office/rmp.html.

1.6 Relationship to Statutes, Regulations, or other Plans

This document is tiered to the Proposed Dillon RMP/Final Environmental Impact Statement (EIS).

All treatments of invasive species in the proposed action will conform to the guidance and standards set forth in the Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic EIS approved on September 29, 2007 and the Noxious Weed Control on Public Lands EA (MT-050-08-12) approved April 2008, to which this EA is tiered.

The proposed action is also in conformance with the Federal Land Policy and Management Act, the Taylor Grazing Act, the Standards for Rangeland Health and Guidelines for Grazing Management (43 CFR 4180), and with BLM policies and Federal regulations.

The proposed action is consistent with the 2010 Nonpoint Source Memorandum of Understanding. It was developed while considering the goals, objectives and management recommendations in the Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout in Montana, the BLM's National Sage-grouse Strategy, Memorandum of Understanding and Conservation Agreement for Montana Arctic Grayling Restoration and the Management Plan and Conservation Strategies for Sage Grouse in Montana.

1.7 Unique Characteristics of the Geographic Area

Table 1.2 Unique Characteristics of the Geographic Area

| Resource | Not Present | Present but Not Affected | Present & May be Affected * | Comments / Addressed in EA Section(s): |
|---|-------------|--------------------------|-----------------------------|---|
| Air Quality | | | X | Discussed under Section 3.5.4 |
| Areas of Critical Environmental Concern | X | | | -- |
| Cultural Resources | | X | | Discussed under Section 3.5.1 |
| Environmental Justice | X | | | No low-income populations, minority populations, or Indian tribes identified in the UBHW |
| Farmlands (Prime or Unique) | X | | | -- |
| Floodplains ¹ | | | X | Discussed under Key Issue #1 – Riparian, Wetland, and Aquatic Habitat |
| Invasive, Non-native Species | | | X | Discussed under Section 3.5.3 |
| Native American Religious Concerns | X | | | -- |
| Threatened, Endangered, Candidate &/or BLM Sensitive Plant Species | | | X | Discussed under Resource Concern #2 – Special Status Species |
| Threatened, Endangered, Candidate &/or BLM Sensitive Animal Species | | | X | Discussed under Resource Concern #2 – Special Status Species |
| Wastes (hazardous or solid) | X | | | -- |
| Water Quality (drinking/ground) | | | X | Drinking water not affected. Ground water discussed under Key Issue #1 – Riparian, Wetland, and Aquatic Species |
| Wetlands/Riparian Zones | | | X | Discussed under Key Issue #1 – Riparian, Wetland, and Aquatic Species |
| Wild and Scenic Rivers | X | | | -- |
| Wilderness | X | | | -- |
| * An “X” in this box means that the resource will be analyzed in affected environment and environmental impacts sections of this EA. (NOTE: This does not mean impacts are likely to be significant in any way). ¹ Floodplains are part of stream systems. Actions which improve streams and riparian habitats will comply with Executive Order 11988 in that they are designed to restore and preserve the natural and beneficial values served by floodplains. | | | | |

1.8 Identification of Issues, Resource Concerns and Associated Objectives

Key Issues. These issues have a direct bearing upon the proposed action and the process of how we achieve the purpose and need. They are used to drive development of alternative ways to achieve the purpose and need. The effects to these issues are analyzed in detail. Differences in these effects are used to measure the trade-offs between alternative actions.

Resource and Social Concerns. Resource concerns do not drive the development of alternatives, but are used to analyze and disclose the effects of various actions. Issues and resource concerns were identified through the Watershed Assessment and scoping process. Not all issues identified below are applicable to all allotments and the unallotted tracts in this EA.

Key Issue #1: Riparian, Wetland, and Aquatic Habitat

“Riparian and Wetland Areas are in Proper Functioning Condition” (PFC) is identified as one of the Western Montana Standards for Rangeland Health. PFC is defined as the ability of a stream or wetland to perform its riparian functions. Streams or wetlands that are categorized as PFC or Functioning-at-Risk (FAR) with an upward trend meet the riparian health Standard.

The riparian health standard was **not** met in six allotments and one unallotted parcel including the Big Swamp, Big Swamp Creek, Mussigbrod On and Off, North Fork Big Hole, Steel Creek, and Warm Springs Allotments, and the Swamp Creek Unavailable tract.

Objectives

- Restore stream dimension, pattern and profile to the natural range of variation, as measured by the width/depth ratio of stream channels appropriate to stream type.
- Increase deep-rooted riparian vegetation (sedges, willows) along the greenline.
- Increase wetland and facultative vegetation within wetlands, seeps and springs.
- Enhance habitat for cold water fisheries in occupied streams within the watershed.
- Seek opportunities to work cooperatively with adjacent landowners to divert water back into natural channels.

Key Issue #2: Forest and Woodland Habitat

Forest and woodland habitats across the assessment area were found to be Functioning, but with concern. Lack of age class diversity in aspen, threat of insect and disease outbreaks, conifer encroachment, and fuels conditions were all contributory factors, but did not result in any allotment failing to meet one or more of the Standards for Land Health.

Objectives

- Improve and/or maintain the distribution of forested habitat in each seral stage (short term and long term) and Fire Regime Condition Class (FRCC) rating.
- Increase the diversity of aspen found in the Bartos and Campbell (1998) 3-class condition rating system.
- Reduce the Mountain Pine Beetle hazard rating in lodgepole pine stands.
- Protect existing ponderosa pine.
- Maintain security cover in big game fall and winter range along existing travel corridors.

Resource Concern #1: Sagebrush Steppe Habitat

Conifers expanding into sagebrush and grassland habitats are typically less than 65 years old. The Warm Springs and Steele Creek allotments were found to be experiencing moderate to high levels of conifer expansion into sage/grasslands; and Moosehorn, Foxtail, and Dry Creek allotments were noted as experiencing low to moderate levels of expansion into sage/grasslands.

The UBHW, though not heavily impacted by noxious weeds, is an area at high risk for invasion due to the increased use of this area by recreationists. The valley is surrounded on three sides with potentially habitat altering species. Rush Skeletonweed and yellow starthistle have invaded several thousand acres of land in Idaho and currently occur near the Montana border. Blueweed, a new invader in the Bitterroot Valley, has been found on Lost Trail Pass. Leafy spurge, though not a new invader to Montana, has been found on the lower Big Hole River near Melrose.

Objectives

- Increase the ratio of sagebrush canopy to conifer canopy and FRCC acreages to more historic distribution.
- Maintain existing sagebrush habitat so that 75% or more of potential big sagebrush communities provide vegetative composition and structure for sagebrush obligate species.

Resource Concern #2: Special Status Species

“Special Status Species” refers to both plants and animals and includes species listed as threatened or endangered (T&E) under the Endangered Species Act (ESA), species proposed for listing under the ESA, candidates for listing under the ESA, state listed species, and BLM Sensitive Species.

There are no T&E species known to occur, nor is there any critical habitat designated within the UBHW. Sage grouse were listed as a candidate species to the Federal Threatened Species list on March 04, 2010. A list of special status species known to occur within the UBHW and their preferred habitat can be found in Table 5 of the Watershed assessment report.

Historically, WCT were found in most streams in SW Montana. Competition with non-native eastern brook trout, hybridization with rainbow trout, Yellowstone cutthroat trout and habitat de-gradation have reduced pure populations of WCT to less than 3% of their historic range. The WCT in Montana is currently listed as a special status species by the State, Forest Service and BLM. Woody Creek is currently the only known westslope population on public land in this assessment.

Montanan fluvial arctic grayling historically were found throughout the Upper Missouri River drainage from Great Falls upstream. Competition with non native species, dams and other changes to the river system have combined to restrict this native species to a small portion of their former range. Today the last native self sustaining population of fluvial grayling in Montana is found in the Big Hole River.

Populations of Lemhi Beardtongue, Hikers gentian, and Primrose monkeyflower, all BLM sensitive plant species, were discovered on BLM administered lands in the UBHW during the summer of 2009.

Objectives

- Improve the functioning condition of Woody Creek, reach 1901, to PFC
- Remove non native eastern brook trout and restore Woody Creek to an allopatric WCT stream
- Secure Woody Creek from non native salmonids
- Improve the functioning condition of North Fork Big Hole River, reaches 1909 and 1923, to PFC
- Maintain 15-25% sagebrush canopy and residual herbaceous cover for sage grouse nesting and brood rearing success.
- Maintain or increase the population trend of Lemhi beardtongue, Primrose monkeyflower, and Hikers gentian.

Also refer to the objectives under Section 1.8.1 above – Riparian, Wetland, and Aquatic Habitat.

Resource Concern #3: Socioeconomics

Many ranches that hold grazing permits on public lands administered by the BLM have developed operations that tightly weave public land grazing preferences together with private land management. For these ranches; calving, breeding, haying, feeding, shipping, summer pasturing and marketing schedules have evolved in tandem with the stocking rates and season of use on the public land allotments.

Businesses in southwest Montana are likely to profit from recreational uses that occur in the UBHW. Fishing and big game hunting activities provide important economic benefits to the Wisdom, Jackson and Wise River economies, due to the close proximity of these communities to popular fishing and hunting areas.

Utilization of timber resources from public lands has historically resulted in an economic benefit to Beaverhead County. The potential for utilization of commercial forest products still exists.

Table 56 on page 286 of the *Proposed Dillon RMP and Final EIS* shows employment and labor income response related to livestock grazing management, timber management and recreation use for the area influenced by the Dillon Field Office.

Objective

- Continue to contribute to the local economy by providing an opportunity for sustainable uses on public land through livestock grazing, utilization of forest products, and recreational opportunities.

Resource Concern #4: Travel Management

There are 11.02 miles of designated motorized vehicle routes on BLM administered land within the UBHW. The majority of use in this area is recreational ATV and 4WD use and relatively high use associated with the big game hunting season. The majority of the designated motorized routes in the watershed are primarily isolated road segments on BLM administered lands that depend on access across private lands (mostly on county roads) to access recreational opportunities on the Forest Service lands.

Objectives

- Implement the Dillon RMP Travel Management Plan.
- Maintain motorized wheeled vehicle access to those areas where it already exists, and pursue opportunities to improve access across private lands on a willing landowner basis where opportunities are currently limited.
- Reduce unauthorized (non-designated route travel) motor vehicle use and close new unauthorized roads and trails when they are discovered.
- Make minor adjustments to open roads to account for mapping errors that occurred during travel management planning and/or mitigate resource concerns.

1.9 Summary

This chapter has presented the purpose and need of the proposed project, as well as the relevant issues, i.e., those elements of the human environment that could be affected by the implementation of the proposed project. In order to meet the purpose and need of the proposed project in a way that resolves the issues, the BLM has developed a range of action alternatives. These alternatives, as well as a no action alternative, are presented in Chapter 2. The potential environmental impacts or consequences resulting from the implementation of each alternative are then analyzed in Chapter 4 for each of the identified issues.

2.0 DESCRIPTION OF ALTERNATIVES

2.1 Introduction

This chapter describes the alternative development process, alternatives considered in detail, and alternatives considered but not given detailed study. The alternatives considered in detail have been designed to address the resource issues identified from internal and external scoping.

This chapter compares how alternatives address each issue identified. This comparison, along with a disclosure of Environmental Consequences (Chapter 4) identifies the tradeoffs to the Authorized Officer (Field Manager) to make an informed choice between alternatives. This EA summarizes more detailed information found in the UBHW Project File and individual allotment and stream files. All of these files are located at the Dillon Field Office.

2.2 Process Used to Formulate Alternatives

Alternatives were developed based upon National and State BLM direction and policy, existing condition and environmental issues. Environmental issues are discussed in section 1.8 of Chapter 1. Other factors that influenced alternative development are discussed in Chapter 3. When developing and considering alternatives, the ID team evaluated them against the purpose(s) of the proposed action. With the exception of the No Action alternative, alternatives that wouldn't make progress toward meeting resource objectives were dropped from further consideration. These alternatives are discussed in sections 2.4 through 2.9.

2.3 Alternatives Considered but Eliminated from Further Analysis

Analysis of alternatives that would not make significant progress towards meeting the objectives of the proposed action or alternatives not consistent with the intent of current BLM legal and regulatory requirements or policy are not carried through. Alternatives proposing exclusive production or protection of one resource at the expense of other resources were not considered. FLPMA mandates the BLM to manage public lands for multiple use and sustained yield. This eliminates alternatives such as closing all public land to livestock grazing or oil and gas leasing, or managing only for wildlife values at the exclusion of other considerations. In addition, resource conditions do not warrant watershed area-wide prohibitions of any particular use. Each alternative considered in this EA allows for some level of support, protection, and/or use of all resources present in the planning area.

Elimination of Livestock Grazing on BLM Administered Lands in the Upper Big Hole Watershed

Eliminating livestock grazing from all BLM-administered lands in the watershed was considered, but eliminated from detailed study for the following reasons.

- Eliminating livestock grazing from all BLM-administered lands in the watershed does not meet the purpose and need of this EA.
- A “No Grazing” alternative was previously analyzed in the Mountain Foothills EIS (March 1980).

- The recently updated and approved Dillon RMP identifies 6,052 acres of public land in the UBHW as open to livestock grazing and 280 acres of land as unavailable or closed to livestock grazing, so a watershed wide “No Grazing” alternative would not be consistent with the Dillon RMP.
- A watershed wide “no grazing” alternative would not meet the objectives for this planning effort, and is not consistent with the intent of other applicable acts, laws, and policies.
- Due to the intermixed land ownership pattern in the allotments included in the UBHW, at least 31.5 miles of fence would need to be constructed between private land and BLM administered land to effectively implement a no grazing alternative on BLM administered land. Surveying, constructing, and maintaining an additional 31.5 miles of fence along BLM boundaries would be cost prohibitive and cause an unacceptable level of barrier/entanglement hazard for big game within the UBHW.

Re-introduction of beaver to the North Fork of the Big Hole River and Warm Springs Creek

One of the impaired attributes of these streams was linked to inactive beaver dams. After discussions with Fish Wildlife and Parks biologists, this alternative was eliminated from further analysis. Beavers are not currently active on BLM lands, however, there are active beaver dams within these drainages above and below the BLM parcels, therefore, there is no foreseeable benefit to re-introducing beaver. Beaver activity was noted in every major stream within the watershed and there is no lack of beaver within the UBHW. The beaver will continue to move through these drainages as vegetation moves through successional stages.

Prescribed Burning in Warm Springs Allotment

The use of prescribed fire and/or mechanical treatments to remove conifer encroachment into sage/grassland habitats in the Warm Springs Allotment was considered but eliminated from detailed analysis. Burning in this area would be difficult due to access, the lack of natural fire breaks, as well as continuous fuels which may be difficult to contain and/or control, and could potentially pose a threat to the adjacent private and US Forest Service lands. Monitoring of the area will continue and additional NEPA documentation would be completed if treatments are proposed before the next assessment.

Fencing the Big Swamp Creek Allotment

Fencing the Big Swamp Creek Allotment (364 acres) to manage it as a Riparian Pasture or to eliminate livestock grazing on the tract was considered, but eliminated from detailed study due to the cost required to construct the fence. Since this entire area has wetland soils, jack and rail fence would be required. It would take approximately 4 miles of jack and rail to fence the entire allotment at a cost of approximately \$43,000/mile (\$29,000 for materials and \$14,000 for labor). The total cost to fence this allotment would be approximately \$172,000 or about \$472/acre. Data from the Montana Cadastral website indicates that in 2009, adjacent private lands were appraised at about \$182/acre. Fencing the entire parcel would be cost prohibitive and therefore was not analyzed further.

Fencing Swamp Creek and Inabnit Butte unavailable parcels

Fencing the Swamp Creek unavailable parcel was considered, but eliminated from detailed study because the cost of fencing this 40 acre tract surpasses potential benefit gained to resource conditions. This 40 acre tract is highly disturbed due to past uses and has been identified for disposal in the Dillon RMP. The Gibbonsville road (county road) dissects this parcel from northeast to southwest. In addition, there is an existing fence, an irrigation ditch, and a two track road that dissect the parcel from northeast to southwest and a gravel pit along the north boundary of the tract. It would take 0.75 miles of fence to fence this parcel on the boundary. The west boundary of the parcel is fenced and has a double cattleguard in the county road, but an additional 16 foot cattleguard would be needed on the east side of the parcel if it were fenced. Cost estimates to construct 0.75 miles of fence (about .3 miles jack and rail, the remainder steel and wire) and install a double cattleguard are over \$22,000.

Fencing the Inabnit Butte unavailable parcels was considered but eliminated from detailed study because this 40 acre tract met all of the Rangeland Health Standards, has no public access, and has been identified in the Dillon RMP for disposal. It would cost approximately \$8,500 to fence this tract.

Plug or Obliterate Old Drainage Ditches on Foxtail and Big Swamp Allotments

Research, using the DNRC Water Rights Query, revealed that there is at least one Statement of Claim for 210 acre-feet per year with the point of diversion located within wetland 1912 in the Foxtail Allotment. Plugging the ditches leading out of wetland 1912 would obstruct the point of diversion. Drainage ditches on the Big Swamp Allotment consisted of small trenches running perpendicular to reach 1903, and extending into wetland 1967. These ditches were small and the disturbance to wetland 1967 and reach 1903 in order to bring in heavy equipment to obliterate these ditches would outweigh the benefits of obliterating the ditches.

2.4 Features Common to All Alternatives, Including the No Action

Livestock Management:

Renew Term Grazing Permits/Leases for those five allotments determined to be meeting Land Health Standards, had no identified site specific concerns related to current management, and needed no changes to facilitate improved management or accurately reflect current management. These allotments are: Doolittle Tracts, Dry Creek, Foxtail, Jumbo Mountain, and Moose Horn. These allotments would continue to be managed as described under Alternative A (Section 2.5).

Encourage, and if warranted, require use of temporary electric fence, livestock supplement (e.g., salt, protein block) placement, riding, and herding as a means of improving livestock distribution in all alternatives. When used, livestock supplement should be placed at least ¼ mile from the nearest live water source.

Continue to manage the unallotted parcels as unavailable for livestock grazing. No term grazing permits or leases will be issued for these areas.

Amend term grazing permits to state that depredation losses from wolves may occur.

Forest and Woodland Habitat:

Pheromones and/or funnel traps would be utilized in areas where mature ponderosa and/or 5-needle pines are found to be at risk for MPB infestations. Personal use firewood permits and Christmas tree permits would continue to be issued.

Special Status Species:

Conduct field inspections to search for special status plant species prior to authorizing surface disturbing activities in habitats likely to support rare plants. If rare plants are found in the course of the botanical survey, adverse impacts will be mitigated through project abandonment or redesign. Activities that disturb mineral soil (such as blading, trenching, ripping, etc.) will not be allowed within the boundaries of populations of special status plants.

Inventory and map the Lemhi beardtongue, Hiker's gentian, and Primrose monkeyflower populations discovered on BLM administered lands in 2009. The inventory should include the number of individual plants, a description of the habitat and an assessment of any existing and potential threats to the population.

Continue to work cooperatively with MFWP on arctic grayling habitat restoration projects within the Big Hole Watershed.

Noxious Weeds:

Continue management of noxious weeds in cooperation with Beaverhead County, federal and state agencies, private landowners and other partners. Treat all invasive species on the Montana state noxious weed list as resources allow. Areas where private landowners actively cooperate, participate, and support the BLM's weed management strategies, are given a higher priority for treatment.

Continue to participate in the Continental Divide Barrier Zone project and work on establishing an accurate inventory of all noxious weeds both within the UBHW and surrounding areas.

Cultural Resources:

Personnel from the BLM should be notified of the presence and location of any cultural resources should they be encountered by any permittees or contractors during the course of operations on public lands.

Structural Projects:

Install wildlife escape ramps in all existing and new water developments. Remove, modify, or rebuild existing BLM fences that impede wildlife movement to BLM specifications on a prioritized schedule. Coordinate with landowners to modify, remove, or rebuild fences that border BLM lands, but are not owned by BLM, which impede wildlife movement.

Monitoring:

Conduct resource monitoring to measure progress toward meeting site-specific objectives. Monitoring will be conducted according to the monitoring plan shown as Appendix B.

2.5 Alternative A – Continue Current Management (No Action):

Livestock Grazing:

Livestock grazing would be authorized on all UBHW allotments as currently permitted. No new projects would be constructed and no modifications would be made to existing projects. Livestock numbers and season of use for all allotments are presented in Table 2.1. All unallotted parcels would remain unavailable to livestock grazing authorizations.

Table 2.1 Current Livestock Grazing Allocation and Management within the UBHW

| Allotment Name | Livestock # & Kind | Grazing Begin | Grazing End | % Public Land | Active AUMs | Grazing System |
|---------------------------|---|---|---|--|---|---|
| Big Swamp | 8 cattle | June 1 | Oct. 30 | 100 | 38 | Season-long |
| Big Swamp Creek | 15 cattle | June 1 | Oct. 30 | 100 | 76 | Season-long |
| Doolittle Tracts | 6 cattle | Sept. 1 | Sept. 30 | 100 | 6 | Deferred-Rotation |
| Dry Creek | 249 cattle | July 1 | Sept. 30 | 7 | 53 | Rest-rotation * |
| Foxtail | 15 cattle | July 1 | Sept. 30 | 100 | 45 | Season-long |
| Jumbo Mountain | 7 cattle | June 26 | Sept. 25 | 100 | 22 | Season-long * |
| Moosehorn | 10 cattle | May 1 | Oct. 30 | 100 | 61 | Season-long |
| Mussigbrod | 11 cattle | July 1 | Sept. 30 | 100 | 34 | Deferred-rotation * |
| North Fork Big Hole | 3 cattle | May 15 | Nov. 14 | 100 | 32 | Season-long |
| Steel Creek | 23 cattle | June 15 | July 31 | 100 | 34 | Season-long |
| Warm Springs | 3 cattle | May 15 | Dec. 14 | 100 | 21 | Season-long |
| Wildwood | 2 cattle | May 15 | Sept. 30 | 100 | 11 | Season-long * |
| Unallotted Parcels |  |  |  |  |  |  |
| Fox Gulch | -- | -- | -- | -- | -- | * |
| Swamp Creek | -- | -- | -- | -- | -- | -- |
| Dry Creek – Sec 29 | -- | -- | -- | -- | -- | -- |
| Miner Creek – Sec. 1 | -- | -- | -- | -- | -- | * |
| Inabnit Butte | -- | -- | -- | -- | -- | -- |

* At least portions of these allotments or parcels are fenced in with National Forest lands and are grazed in conjunction with Forest Service grazing allotments administered by the Wisdom Ranger District of the Beaverhead-Deerlodge National Forest.

Forest and Woodland Habitat

Under the No Action Alternative, no new treatments (for improving habitat, aspen restoration, fuels reduction, salvage of dead/dying, or encroachment treatments) would be implemented.

2.6 Features Common to All Action Alternatives:

Administrative Actions:

Pursuing opportunities to exchange or dispose of the three 40 acre tracts of BLM in the UBHW that are in Land Adjustment Category 3 which are lands targeted for potential disposal in the Dillon RMP would continue. This includes the Swamp Creek and Inabnit Butte unavailable parcels and the BLM 40 acre tract in the Warm Springs Allotment.

Livestock Management:

Mussigbrod #20750 and Wildwood Individual #30250 Allotment Boundary Adjustment:

Allotment boundaries would be changed on the Mussigbrod and Wildwood Individual Allotments as shown on Map 2. The two parcels included in the Mussigbrod Allotment are fenced in and managed with the USFS Mussigbrod Allotment. The two parcels included in the Wildwood Individual Allotment are fenced in and managed with private land, met all standards, and would continue to be managed as a custodial allotment. To reflect the change in allotment boundaries, AUMS would be adjusted from 34 to 36 on the BLM's Mussigbrod Allotment and 11 to 9 on the Wildwood Individual Allotment.

Allowable Use Levels:

Annual utilization guidelines (allowable use levels) for cool-season bunch grasses would be 50% (to maintain plant health/vigor) OR when livestock use on sedges averages four inches along the greenline (to prevent excessive trailing along streams) on non-fisheries or non-native fisheries streams and six inches on WCT and arctic grayling streams, whichever occurs first. These annual use guidelines would be added to the terms and conditions of the term grazing permits, and would be applicable to all allotments included in the UBHW as a tool to determine moves between pastures and/or off the allotment, and in conjunction with long term trend data to determine management effectiveness.

Flexibility:

With prior approval, more livestock may be grazed for a shorter period, within the authorized dates, so long as the active AUMs are not exceeded.

With prior approval, authorize flexibility for the season of use on each allotment to address varying local weather and forage conditions on an annual basis. The beginning and ending date may vary up seven days depending on variations in weather and forage. Livestock may need to be removed from a specific pasture prior to the maximum number of days specified in the grazing plans rotation schedule. If this occurs, the grazing dates for the next pasture will be adjusted proportionally. Conversely, if annual production is unusually high, livestock may be allowed to remain in a given pasture for up to five additional days and the remainder of the rotation schedule adjusted accordingly. The maximum authorized AUMs, as specified in the Term Grazing Permits, cannot be exceeded by allowing this flexibility.

The grazing sequence may be changed on an annual basis due to drought or other unforeseen natural events after consultation with BLM and written approval.

Access:

Permittees or lessees shall provide reasonable administrative access across private and leased lands to the Bureau of Land Management for the orderly management and protection of the public lands.

Forest and Woodland Habitat:

Commercial Timber Harvest and Salvage:

Both action alternatives will analyze utilizing conventional ground-based harvesting equipment. Ground based harvest techniques would include hand or machine falling and then tractor and/or cable yarding the merchantable timber to landings. Ground-based harvest equipment would require yarding distances of up to 1,500' for practical operations and access to log landings.

Standard timber sale contract provisions which provide protection from erosion, sedimentation, and soil compaction would be adhered to. Harvest activity and associated operations would be permitted between December 2 and September 1 (dates inclusive). Activity would be allowed between August 31 and December 1 (dates inclusive), in no more than two units at a time. All harvest activity would be under a two year contract.

At the minimum, an average of two to five existing snags or green recruitment snags would be left per acre within all commercial harvest units. Retention patches of uncut timber would be scattered throughout the harvest units and along open travel routes to provide wildlife screening cover and reduced sighting distances. Leave patches would be situated to provide linkage corridors and screening cover between potholes and in areas that have one or more of the following attributes: a viable aspen clone (a viable aspen clone is defined as 5 or more live stems greater than 1 inch DBH); smaller diameter material; mature size classes of lodgepole pine with a Dwarf Mistletoe Rating (DMR) of less than 3; mature size classes of Douglas-fir, ponderosa pine, or Engelmann spruce; and/or where there is noticeable wildlife use. Leave patches would be irregularly shaped and would range from 1-5 acres in size. Within harvest units, conifers in natural openings may be cut to maintain and promote the expansion of existing sagebrush habitat.

If market conditions permit, biomass material may be removed from within mechanical treatment units. Sufficient residual biomass material (5-20 tons/acre) would be left on site to maintain nutrient recycling and desirable microsite conditions. Log landings would be reseeded with native grasses/forbs upon the completion of treatments.

One season of rest may be needed prior to prescribed burning to allow sufficient fine fuels (grasses) to ensure a successful burn. Generally, two growing seasons of rest would be required following burns to allow re-growth and re-establishment of vegetation in the treated areas. Prescribed burning treatments that are associated with harvest would be intended to consume residual slash.

In harvest units, prescribed burning would take place within five years following harvest to consume residual slash. Treatment of noxious weeds and cheatgrass in association with harvest/burn units would be determined on a case-by-case basis, but would be

mitigated within the terms of the contract. The BLM staff would coordinate prior to vegetation treatments to determine if prescribed burns, commercial harvesting and road construction require an extended buffer zone of up to 300' adjacent to fish bearing streams, or if treatment is desirable within the SMZ as allowed under alternative practices protocol. Guidelines as described in the Montana Streamside Management Zone (SMZ) law would be the minimum standard design features for harvest operations unless alternative practices authorizations are obtained.

Existing two track or currently closed roads that do not meet State of Montana BMP standards would either be upgraded to meet BMPs or would not be used for forest product removal. Use of existing public access roads would be evaluated for additional watershed protection measures as needed on a case by case basis. Construction standards on new temporary roads would be to the minimum required for safe transport of merchantable material. Road locations would be designed to minimize stream or wet area crossings. All currently closed two track and new temporary roads used for forest health treatments would be closed upon the completion of forest management activities. Post-treatment road closure would be accomplished by placing slash material on the road surface to preclude vehicle use and/or recontouring, and reseeding with native grasses/forbs.

Silvicultural Prescriptions:

Silvicultural prescriptions for all commercial harvest and salvage treatment units are as follows. Assume removal of merchantable products from treatment units where practical.

Lodgepole pine dominated stands:

Units that are 50 acres or less would be clearcut and would leave approximately 15% of the total unit acreage in 1-3 acre leave patches. Units that are greater than 50 acres, would be clearcut and would leave approximately 15% of the unit in 1-5 acre leave patches (See Table 2.11 in Section 2.7.2 and Table 2.21 in Section 2.8.2 below for the minimum acreage amounts for retention patches that would be left within the unit boundaries). All lodgepole that is less than 6" DBH and has a DMR of 3 or less would not be treated and disturbance would be minimal. Where logging access is necessary, skid trails would be minimized through regenerating stands.

Mixed conifer stands:

All mature ponderosa pine would be left and other species would be thinned to a residual basal area of 20 to 120 ft²/acre depending on local site conditions and historic fire occurrence. The younger age classes of Douglas-fir would be thinned from below to a residual basal area of 80 ft²/acre where trees occur. Basal area would vary from 20 to 120 ft²/acre depending on local site conditions and historic fire occurrence. Up to 80% of recent dead and dying trees would be cut and removed as needed to maintain residual stand health. All existing snags greater than 20" DBH would be left unless they pose a safety hazard. All mature spruce, sub-alpine fir, ponderosa and 5-needled pines would be left and protected, as far as is practicable, from mechanical damage. Seedlings and saplings would also be protected, as far as is practicable, from mechanical damage. Lodgepole with a DMR greater than 3 would be cut and removed.

Mixed Conifers and Aspen:

All merchantable (>6 inch diameter at breast height (DBH)) conifers that are within 100 feet of a viable clone would be cut. All non-merchantable conifers within 100 feet of clone would be cut and left on-site as a browse barrier. Follow up prescribed burning would aim to consume the fine hazardous fuels but retain the larger woody component. Livestock grazing would be excluded through timing or fencing in units that are 100 acres or less until aspen regeneration is a minimum of five feet tall on average. In addition, temporary fencing may be required in treatment units where it is determined (through pre and post implementation monitoring) that existing aspen regeneration is experiencing heavy browse pressure which is contributing to the decline of a clone.

Commercial Firewood:

Commercial firewood units would be permitted as interest and access allows. Only dead material (trees with no needles or red needles) would be cut as designated within units. Only existing roads would be used to remove materials and equipment would be limited to ATV's, horses, and small tractor equipment. Prescribed fire may be utilized following commercial firewood harvest to consume slash left in the units. Contractors may be required to pile slash prior to prescribed fire treatment.

Sagebrush Steppe Habitat:

The burn unit in the Steel Creek Allotment is primarily Douglas-fir with a small aspen component. Treatment in this unit would aim to reduce the amount of conifer encroachment into aspen, sagebrush and grassland habitat types by use of prescribed fire, while also increasing the potential habitat for Lemhi beardtongue, a special status species. The aspen regeneration is currently being heavily browsed by wildlife and mature stems are becoming decadent and/or are succeeding to conifers. The unit is accessed by one existing road.

Within portions of the identified prescribed burn unit in the Steel Creek Allotment, conifer encroachment is present and would be targeted for treatment using prescribed fire. Prescribed burn unit boundaries would be based on topographical features such as ridges, drainages, natural barriers or in some instances two tracks or roads. Treatment by prescribed fire would only be completed where the ground fuels and conifer trees are in a condition that would meet the prescription objectives. Prescribed burning requires an approved burn plan prior to implementation. In areas where vegetation conditions would not allow prescribed fire to achieve the objectives alone, a combination of mechanical treatments followed by prescribed burning may be utilized. In conifer encroachment areas, an emphasis would be placed on maintaining a mosaic of mature sagebrush canopy cover. The implementation of prescribed fire treatments would occur over the next five to ten years. Units would be burned as fuel and weather conditions allow. Fire managers would coordinate the timing of prescribed fire treatments seasonally.

Special Status Species:

To protect and enhance the WCT population and riparian habitat conditions on Woody Creek, a corridor fence (jack and rail) would be constructed along approximately .7 miles of Woody Creek to eliminate current livestock impacts. The proposed fence would

exclude approximately .2 miles of private and .5 miles of BLM administered stream from livestock use. After fence completion and with the cooperation of the landowner, a fish passage barrier would be installed on the private property near the confluence of Woody and Warm Springs Creek to prevent future colonization from non native salmonids into Woody Creek. Following barrier construction non native brook trout would be removed from Woody Creek using electro-shocking in cooperation with MT FWP and USFS B-D. In order to facilitate the non native removal, some minor willow pruning would be completed to allow more efficient access to the stream channel to conduct the electro-fishing. The pruning would primarily involve overhanging and decadent willow stems and branches.

Cultural Resources:

Section 106 of the National Historic Preservation Act requires that a Class III cultural resource inventory be conducted prior to the implementation of any proposed range or habitat improvement projects. Should significant cultural resources be identified, adverse impacts would be mitigated through project abandonment or redesign. Care would be taken to avoid and protect significant cultural resources and any standing structures (should they occur) during the course of any proposed projects.

Structural Projects:

All proposed fencing projects on public lands would conform to wildlife friendly specifications as described in BLM fencing handbook H-1741-1. In wetland areas, jack and rail fences are necessary due to soil instability. Rails would be placed lower in big game crossing areas to accommodate wildlife movement.

Stream Restoration:

Pending results of the water adjudication process, BLM would work with partners including MDNRC, NRCS, MFWP, and private landowners to restore natural stream dimensions, profile, and pattern to reach 1903 on the Big Swamp Allotment.

Wetland Restoration:

The following actions would be taken in the Dry Creek Allotment for wetland restoration and can be found on Map 3:

- Remove the culvert above wetland 1994
- Plug and fill ditch at wetland 1994

Travel Management:

The following actions would be taken within the Dry Creek Allotment and are shown on Map 3.

- To correct a mapping error, un-designate ½ mile of “open” road in sections 4 (T5S, R16W) and 33 (T4S, R16W)
- To improve public access, designate an additional 1½ miles of 2-track roads as “open” in sections 4 (T5S, R16W) and 33 (T4S, R16W)
- To improve public safety remove the bridge over stream reach 1904

2.7 Alternative B

2.7.1 Livestock Grazing:

Grazing Alternative B is presented by allotment for the Big Swamp, Big Swamp Creek, Mussigbrod, North Fork Big Hole, Steel Creek, and Warm Springs Allotments. Specific proposals for each allotment are detailed below.

Big Swamp # 10141 (Map 4)

Table 2.2: Proposed Authorized Livestock Use for Big Swamp – Alternative B:

| Allotment Name | Livestock # & Kind | Grazing Begin | Grazing End | % Public Land | Active AUMs | Grazing System |
|----------------|--------------------|---------------|-------------|---------------|-------------|-------------------|
| Big Swamp | 21cattle | June 10 | Aug. 31 | 67 | 38 | Deferred Rotation |

Terms and Conditions:

The BLM lands would be managed in a two-treatment deferred rotation with adjacent private lands with a herd size of up to 80 cow/calf pairs. The season of use would be shortened and the percent public land would be adjusted as shown above in Table 2.2. Authorized active AUMs would remain at 38.

With a herd size of 80 cow/calf pairs the BLM Pasture (67% BLM) would be grazed for 21 days annually as shown in Table 2.3. The beginning and end dates for grazing in each of the adjacent pastures (100% Private) are expected to vary from year to year and would be determined by the private landowner.

Table 2.3: Proposed Rotation on the Big Swamp Allotment with 80 cow/calf pairs

| | Pastures | |
|---|------------------------------------|----------------------------------|
| | BLM pasture (67% BLM; 33% Private) | Adjacent Pastures (100% Private) |
| 1 | June 10 - July 1 | July 1 – August 31 |
| 2 | August 10 – August 31 | June 10 – August 9 |

If the herd size is decreased to 40 cow/calf pairs, the season of use in the BLM Pasture would be lengthened to 42 days annually as shown in Table 2.4. Beginning and end dates for grazing in each of the adjacent private pastures would be determined by the private landowner.

Table 2.4: Proposed Rotation on the Big Swamp Allotment with 40 cow/calf pairs

| Year | Pastures | |
|------|------------------------------------|----------------------------------|
| | BLM Pasture (67% BLM; 33% Private) | Adjacent Pastures (100% Private) |
| 1 | June 10 - July 21 | July 22 – August 31 |
| 2 | July 21 – August 31 | June 10 – July 20 |

No new projects would be required on BLM administered lands.

Big Swamp Creek #20715 (Map 4)

Table 2.5: Proposed Authorized Use for Big Swamp Creek – Alternative B:

| Allotment Name | Livestock # & Kind | Grazing Begin | Grazing End | % Public Land | Active AUMs | Grazing System |
|-----------------|--------------------|---------------|-------------|---------------|-------------|-------------------|
| Big Swamp Creek | 133 cattle | July 1 | Aug. 31 | 28 | 76 | Deferred Rotation |

Terms and Conditions:

The allotment would be managed in a two-treatment deferred rotation grazing system. Use would alternate between July during even years and August during odd years. The season of use would be shortened and the percent public land would be adjusted to 28% public land based on available AUMs. The maximum time authorized within the allotment would be 30 days annually. Currently fenced within the Big Swamp Creek Allotment are 362 BLM administered acres, 273 acres of private land owned by the permittee, and 320 acres of private land leased by the permittee for a total of 957 acres. Authorized active BLM AUMs would remain at 76. The length of time livestock are on the allotment could vary as shown below depending on herd size, but maximum herd size would be 500.

- 500 cattle – 16 days
- 400 cattle – 21 days
- 300 cattle – 27 days
- 270 cattle – 30 days

No new projects would be required on BLM administered lands.

Mussigbrod # 20705 (Map 2)

The two parcels that make up the Mussigbrod Allotment are fenced in and managed with the USFS Wisdom Ranger District’s Mussigbrod Allotment. The USFS Wisdom Ranger District is scheduled to review conditions and complete NEPA on their Mussigbrod Allotment in 2011. The BLM Mussigbrod Allotment would be included in the new management alternatives developed during the Forest Service NEPA process. In the Interim the authorized use would be as shown below in Table 2.6:

Table 2.6: Proposed Authorized Use for Mussigbrod – Alternative B

| Allotment Name | Livestock # & Kind | Grazing Begin | Grazing End | % Public Land | Active AUMs | Grazing System |
|----------------|--------------------|---------------|-------------|---------------|-------------|-------------------|
| Mussigbrod | 11 cattle | July 1 | Sept 30 | 50 | 36 | Deferred Rotation |

Terms and Conditions:

Since the Mussigbrod Allotment is fenced in and managed with the Forest Service Mussigbrod Allotment, FS Interim Livestock Grazing Standards for deferred-rotation grazing systems would be included in the Terms and Conditions of the revised Term Grazing Permit. These Standards would remain in effect until a new decision is issued as a result of the FS NEPA process scheduled for 2011. Applicable FS Interim Standards are as follows:

- Upland range utilization – Less than or equal to 55% of forage utilized on suitable range on 85% of the area; less than or equal to 65% utilization on remaining 15%.
- Streambank disturbance – Less than or equal to 30% streambank disturbance measured by reach.
- Riparian Stubble Height – Greenline greater than or equal to 4” measured by reach, flood plain greater than or equal to 3” measured by reach.

North Fork Big Hole # 10742 (Map 5)

Table 2.7: Proposed Authorized Use for North Fork Big Hole – Alternative B

| Allotment Name | Livestock # & Kind | Grazing Begin | Grazing End | % Public Land | Active AUMs | Grazing System |
|---------------------|--------------------|---------------|-------------|---------------|-------------|---------------------|
| North Fork Big Hole | 15 cattle | July 1 | Aug 31 | 100 | 32 | Riparian Pasture(s) |

Terms and Conditions:

Approximately 1.75 miles of fence would be constructed around the two 40 acres tracts that make up the North Fork Big Hole allotment. Based on site visits and infrared aerial photos an estimated 1.15 miles of the fence would need to be jack and rail and 0.6 miles could be steel and wire. The allotment would be rested from livestock use for three years to improve riparian conditions to PFC and then be managed as riparian pastures. Beginning three years after completion of the proposed fences, livestock use would be authorized for up to 50 cattle in each 40 acre tract for up to 10 days between July 1 and September 30 once every third year.

Projects:

- One mile of fence around T. 2 S., R. 16 W., section 7, SE¼, NW¼ (0.3 miles steel and barbed and 0.7 miles jack and rail)
- 0.75 miles of fence around T. 2 S., R. 16 W., section 7 SW¼, SW¼. (0.3 miles steel and barbed and 0.45 miles jack and rail)

Steel Creek # 10743 (Map 6)

Table 2.8: Proposed Authorized Use for Steel Creek – Alternative B

| Allotment Name | Livestock # & Kind | Grazing Begin | Grazing End | % Public Land | Active AUMs | Grazing System |
|----------------|--------------------|---------------|-------------|---------------|-------------|----------------|
| Steel Creek | 17 cattle | 10/1 | 11/ 30 | 100 | 34 | Dormant season |

The Steel Creek Allotment would be used during the dormant season annually when the cattle come off the adjacent North Steel FS allotment. Herd size can vary up to 150 head. The Steel Creek Allotment would be managed as a custodial tract and billed at 100% public land.

Projects:

- If conditions along Steel Creek tributary (stream reach 1976) have not measurably improved in three years by changing to dormant season use only, the stream reach would be corridor fenced with approximately 0.6 miles of steel post and wire fence located at T. 2 S., R. 14 W., section 31, E½, SE¼. Changes in conditions would be measured by monitoring identified in Appendix B.

Warm Springs #20715 (Map 7)

Table 2.9: Proposed Authorized Use for Warm Springs – Alternative B

| Allotment Name | Livestock # & Kind | Pasture | Grazing Begin | Grazing End | % Public Land | Active AUMs | Grazing System |
|----------------|--------------------|--------------|---------------|-------------|---------------|-------------|-------------------|
| Warm Springs | 10 cattle | Woody | July 1 | July 16 | 100% | 21 | Deferred Rotation |
| | | | Sept 30 | Oct 10 | | | |
| | | Warm Springs | June 3 | July 8 | | | |

Terms and Conditions:

The Woody Creek Pasture would be used for up to 10 days between July 1 and July 16 and up to five days between September 30 and October 10 annually.

The Warm Springs Pasture would be divided into two units. The fence would be located entirely on private land. Each unit would be used for up to 18 days each year on an alternating basis as shown below in Table 2.10.

The Warm Springs Allotment would be managed as a custodial tract and billed at 100%.

Table 2.10: Proposed Rotation on the Warm Springs Allotment - Alternative B

| Year | Warm Springs Pasture | |
|------|--|---------------------------|
| | North Unit (includes 40 acres of BLM land) | South Unit (100% Private) |
| 1 | June 3 – June 20 | June 21 – July 8 |
| 2 | June 21 – July 8 | June 3 – June 20 |

Projects:

- Construct approximately .7 miles of jack and rail fence along the north side of Woody Creek to exclude livestock grazing on the creek. T. 5 S., R. 14 W., section 21 SE ¼. Lower sections of jack and rail would be included along the fence to facilitate big game movement.

2.7.2 Forest and Woodland Habitat Treatments

Alternative B would allow the salvage harvest of dead/dying timber, sanitation harvest of live trees, thinning of high density conifer stands, and the harvest of conifers in and around aspen stands. This alternative would also allow for commercial removal of biomass as well as commercial and personal use firewood permits. Prescribed burns would be implemented to reduce residual slash after harvest activities, protect WUI areas, promote aspen, and reduce conifer expansion into aspen, sagebrush and grasslands. Silvicultural prescriptions are the same as described above in Section 2.6 (common to all action alternatives section).

Table 2.11 outlines the proposed units, objectives, treatment types, and the affected allotments under Alternative B. Unit locations and boundaries are shown on Maps 2 through 8 in Appendix A.

Table 2.11: Forest and Woodland Habitat Treatments, Alternative B

| Unit Name | Acres | Minimum # of Leave Acres | Allotments | Objective(s) | Treatment Type(s) |
|----------------------------|----------------|--------------------------|------------------------------------|---|--|
| Wild 1 Wild 2 Wild 3 | 84 17 48 | N/A | Wildwood Wildwood Mussigbrod | Decrease standing dead material | Commercial Firewood |
| Moose1 | 38 | 5 | Moosehorn | Protect WUI, Improve forest biodiversity and increase resiliency to insects, disease, drought, and wildland fire, salvage dead/dying forest stands from epidemic insect activity, and treat remaining stands to increase their resistance to insect activity. | Salvage/Commercial Harvest |
| Foxtail | 175 | 26 | Foxtail | Treat Aspen to promote regeneration, Improve forest biodiversity and increase resiliency to insects, disease, drought, and wildland fire, salvage dead/dying forest stands from epidemic insect activity, and treat remaining stands to increase their resistance to insect activity. | Salvage/Commercial Harvest/Prescribed Fire |
| Miner Creek | 48 | 7 | Miner Creek Unavailable | Protect WUI, Improve forest biodiversity and increase resiliency to insects, disease, drought, and wildland fire, salvage dead/dying forest stands from epidemic insect activity, and treat remaining stands to increase their resistance to insect activity. | Salvage/Commercial Harvest |

Description of Salvage/Commercial Harvest Units

Treatment would follow the silvicultural prescriptions and design features described above in Section 2.5.

Wild 1, Wild 2, & Wild 3 are Commercial Firewood units in an area that burned in 2000. Removal would be on a permitted basis and would only allow for the removal of dead material. Wild 1 is a mixture of lodgepole pine and Douglas-fir with a small aspen component. Wild 2 and Wild 3 are primarily lodgepole pine stands that are fire-scorched or have recent mountain pine beetle mortality. Only existing roads would be used in the Commercial Harvest Units.

Moose1 is primarily mature lodgepole pine that may also have a small component of aspen, spruce, subalpine fir, and/or Douglas-fir, as well as patches of smaller diameter lodgepole. One residence is within .25 miles of the timber and would benefit from treatment if a wildfire were to occur. Scattered patches of dead/dying lodgepole pine (due to MPB) occur throughout the stand. All products would be tractor yarded and removed utilizing up to 0.5 miles of new temporary road.

Foxtail is primarily mature lodgepole pine. There is a large component of aspen throughout most of the stand, especially along the southern unit boundary, and skeletons are evident in many areas. There is also a small component of spruce, subalpine fir, Douglas-fir, and limber pine, all of which would be left and protected (as far as is feasible) during the treatment implementation. Scattered pockets of small diameter lodgepole would also be left. Most of the unit is wet year-round which would require most of the harvesting to be done while the ground is frozen or in the late summer months when parts of the unit are dry. All products would be tractor yarded and removed utilizing approximately 1.6 miles of existing road (currently physically closed) that would be re-opened.

Miner Creek is a mixture of mature lodgepole and Douglas-fir. The lodgepole has recent MPB activity and Douglas-fir beetle was identified in the area, but not on BLM-administered lands. It is anticipated that it will likely move into the area if left untreated. This unit is within the Wildland Urban Interface and there are several residences within .25 miles of the timber. These landowners would benefit from treatment if a wildfire were to occur. All products would be tractor yarded and removed utilizing two existing roads within the unit.

Permitted removal of firewood or other minor forest products would be available to the public in all units accessible by existing open roads. Any and all seasonal restrictions apply. After harvesting operations are completed, all new temporary and existing re-opened roads would be physically closed or re-contoured and seeded. Temporary and existing re-opened roads would not be available for the removal of firewood or minor forest products. Where access for firewood or other forest product materials is impractical or creates unacceptable resource conflicts, residual slash material would be burned upon the completion of the purchaser's activity when conditions permit.

The road requirements for conifer treatments proposed under Alternative B are shown on Table 2.12 below. All other units would be accessed using existing roads only.

Table 2.12: Roads, Alternative B

| Unit Name | Allotments | Acres | New Temp Road (miles) | Re-Open Existing Road (miles) |
|-------------|-------------------------|-------|-----------------------|-------------------------------|
| Wild 1 | Wildwood | 84 | 0 | 0 |
| Wild 2 | Wildwood | 17 | 0 | 0 |
| Wild 3 | Mussigbrod | 48 | 0 | 0 |
| Moose1 | Moosehorn | 38 | 0.5 | 0 |
| Foxtail | Foxtail | 175 | 0 | 1.6 |
| Miner Creek | Miner Creek Unavailable | 48 | 0 | 0 |
| Total | | 410 | 0.5 | 1.6 |

2.8 Alternative C

2.8.1 Livestock Grazing:

Grazing Alternative C is presented by allotment for the Big Swamp, Big Swamp Creek, Mussigbrod, North Fork Big Hole, Steel Creek, and Warm Springs Allotments. Specific proposals for each allotment are detailed below.

Big Swamp # 10141 (Map 4)

The BLM lands would be managed in a rest rotation grazing system with adjacent private lands with a herd size of up to 80 cow/calf pairs. The season of use would be shortened and the percent public land would be adjusted as shown below in table 2.13. Authorized active AUMs would remain at 38.

Table 2.13: Proposed Authorized Use for Big Swamp – Alternative C

| Allotment Name | Livestock # & Kind | Grazing Begin | Grazing End | % Public Land | Active AUMs | Grazing System |
|----------------|--------------------|---------------|-------------|---------------|-------------|----------------|
| Big Swamp | 21cattle | June 10 | Aug. 31 | 67 | 38 | Rest Rotation |

With a herd size of 80 cow/calf pairs the BLM Pasture (67% BLM) would be grazed for 21 days during two out of three years and rested the third year as shown in Table 2.14 below. The beginning and end dates for grazing in each of the adjacent pastures (100% Private) are expected to vary from year to year and would be determined by the private landowner.

Table 2.14: Proposed Rotation on the Big Swamp Allotment with 80 cow/calf pairs

| Year | Pastures | |
|------|------------------------------------|----------------------------------|
| | BLM pasture (67% BLM; 33% Private) | Adjacent Pastures (100% Private) |
| 1 | June 10 - July 1 | July 1 – August 31 |
| 2 | August 10 – August 31 | June 10 – August 9 |
| 3 | Rest | Determined by land owner |

If the herd size is decreased to 40 cow/calf pairs, the season of use in the BLM Pasture would be lengthened to 42 days during two out of three years and rested during the third year as shown in Table 2.15 below. Beginning and end dates for grazing in each of the adjacent private pastures would be determined by the private landowner.

Table 2.15: Proposed Rotation on the Big Swamp Allotment with 40 cow/calf pairs

| Year | Pastures | |
|------|------------------------------------|----------------------------------|
| | BLM Pasture (67% BLM; 33% Private) | Adjacent Pastures (100% Private) |
| 1 | June 10 - July 21 | July 22 – August 31 |
| 2 | July 21 – August 31 | June 10 – July 20 |
| 3 | Rest | Determined by land owner |

No new projects would be required on BLM administered lands.

Big Swamp Creek #20715 (Map 4)

Approximately two miles of fence (Swamp Creek Wetland Boundary Fence) would be constructed between the south boundary of BLM administered land and adjacent private land. The BLM lands would be managed in a two-treatment deferred rotation with adjacent private lands with a herd size of up to 500 cow/calf pairs. The season of use would be shortened and the percent public land would be adjusted as shown in Table 2.16 below. Authorized active AUMs would remain at 76.

Table 2.16: Proposed Authorized Use for Big Swamp Creek – Alternative C

| Allotment Name | Livestock # & Kind | Grazing Begin | Grazing End | % Public Land | Active AUMs | Grazing System |
|-----------------|--------------------|---------------|-------------|---------------|-------------|-------------------|
| Big Swamp Creek | 75cattle | July 1 | Aug. 31 | 50 | 76 | Deferred Rotation |

With a herd size of 150 cow/calf pairs the North Pasture (50% BLM) would be grazed for 31 days annually as shown below in Table 2.17. The beginning and end dates for grazing in the South pasture (100% Private) are expected to vary from year to year and would be determined by the private landowner.

Table 2.17: Proposed Rotation on Big Swamp Creek with 150 cow/calf pairs

| Year | Pastures | |
|------|--|------------------------------|
| | North Pasture (Approximately 50% BLM; 50% Private) | South Pasture (100% Private) |
| 1 | July 1 - July 31 | Determined by land owner |
| 2 | August 1 – August 31 | Determined by land owner |

If the herd size is increased to 500 cow/calf pairs the season of use in the North Pasture would be shortened to 9 days annually as shown below in Table 2.18. Beginning and end dates for grazing in the South Pasture would be determined by the private landowner.

Table 2.18: Proposed Rotation on Big Swamp Creek with 500 cow/calf pairs

| Year | Pastures | |
|------|--------------------------------------|------------------------------|
| | North Pasture (50% BLM; 50% Private) | South Pasture (100% Private) |
| 1 | July 1 - July 9 | Determined by land owner |
| 2 | August 23 – August 31 | Determined by land owner |

Projects:

- Approximately 2 miles of jack and rail fence between the south boundary of BLM administered lands and adjacent private land (T5S, R16W, sections 14 & 15).

Mussigbrod # 20705 (Map 2)

Table 2.19: Proposed Authorized Use for Mussigbrod – Alternative C

| Allotment Name | Livestock # & Kind | Grazing Begin | Grazing End | % Public Land | Active AUMs | Grazing System |
|----------------|--------------------|---------------|-------------|---------------|-------------|-------------------|
| Mussigbrod | 11 cattle | July 1 | Sept 30 | 50 | 36 | Deferred Rotation |

Terms and Conditions:

The deferred rotation grazing system in place on the FS Mussigbrod Allotment would be followed (early season one year, late season the next).

Projects:

- Bender Creek tributary (stream reach 1921) would be corridor fenced with approximately 1.0 miles of steel and barbed wire fence. A hardened water gap would be constructed at the lower end of the reach to water authorized livestock.

North Fork Big Hole # 10742 (Map 5)

Administrative Actions:

Include the North Fork Big Hole allotment in an assembled land exchange when the opportunity arises to obtain private lands that are accessible to the public and possess resource values and characteristics that would be beneficial to all public land users. Such an exchange would likely involve a number of different private land owners who would be represented by a third-party exchange facilitator.

In the Interim, authorized livestock use would remain the same as Alternative A.

Steel Creek # 10743 (Map 6)

The Steel Creek BLM Allotment would be fenced with approximately 1.75 miles of steel and wire fence along the private/BLM boundary and authorized use would be changed to dormant season as shown below in Table 2.20.

Table 2.20: Proposed Authorized Use for Steel Creek – Alternative C

| Allotment Name | Livestock # & Kind | Grazing Begin | Grazing End | % Public Land | Active AUMs | Grazing System |
|----------------|--------------------|---------------|-------------|---------------|-------------|----------------|
| Steel Creek | 34 cattle | 10/1 | 10/ 31 | 100 | 34 | Dormant season |

Terms and Conditions:

The allotment could be used for up to 15 days annually within the authorized season of use with a herd size of 70 cattle. With a herd size of 140 cattle, use would be authorized for seven days.

This alternative also has a future option of removing 2 miles of fence between FS and BLM administered lands and managing the Steel Creek Allotment under a five pasture rest rotation system in conjunction with the FS North Steel Allotment.

Projects:

- Approximately 1.75 miles of four strand barbed wire fence would be constructed along the BLM/private land boundary.

Warm Springs #20715 (Map 7)

Administrative Actions:

Include the 40 acres tract in the Warm Springs Pasture in an assembled land exchange when the opportunity arises to obtain private lands that are accessible to the public and possess resource values and characteristics that would be beneficial to all public land users. Such an exchange would likely involve a number of different private land owners who would be represented by a third-party exchange facilitator. Until this administrative action is completed, authorized livestock use would be the same as Alternative A.

Authorized livestock use and Projects in the Woody Pasture would be the same as described under Alternative B.

2.8.2 Forest and Woodland Habitat Treatments

Under Alternative C all the proposed treatments in Alternative B would be carried forward, and additional treatment units are proposed. Table 2.21 outlines the proposed units, objectives, and treatment types for the units proposed under Alternative C. Unit locations and boundaries are shown on Maps 2 through 8 in Appendix A. Silvicultural prescriptions are the same as described above in Section 2.6 (common to all action alternatives section).

Description of Salvage/Commercial Harvest Units

Treatment would follow the silvicultural prescriptions and design features described above in Section 2.4.

Moose2 is primarily mature lodgepole pine that may also have a small component of aspen, as well as patches of smaller diameter lodgepole. Patches of dead/dying lodgepole pine (due to MPB) are scattered throughout the stand. All products would be tractor yarded and removed utilizing existing roads.

Little Rock is primarily mature lodgepole pine that may also have a small component of aspen, spruce, subalpine fir, and/or Douglas-fir, as well as patches of smaller diameter lodgepole. Scattered patches of dead/dying lodgepole pine (due to MPB) are scattered throughout the stand. All products would be tractor yarded and removed utilizing up to 0.5 miles of new temporary road.

Big Rock is primarily mature lodgepole pine that may also have a small component of aspen, ponderosa pine, spruce, subalpine fir, and/or Douglas-fir, as well as patches of smaller diameter lodgepole. Scattered patches of dead/dying lodgepole pine (due to MPB) are scattered throughout the stand. All products would be tractor yarded and removed utilizing up to 0.7 miles of new temporary road and re-opening 1.5 miles of existing roads.

Table 2.21: Forest and Woodland Habitat Treatments, Alternative C

| Unit Name | Acres | Minimum # of Leave Acres | Allotments | Objective(s) | Treatment Type(s) |
|---|----------------|--------------------------|------------------------------------|---|--|
| Wild 1 Wild 2 Wild 3 | 84 17 48 | N/A | Wildwood Wildwood Mussigbrod | Decrease standing dead material | Commercial Firewood |
| Moose1 | 38 | 5 | Moosehorn | Protect WUI, Improve forest biodiversity and increase resiliency to insects, disease, drought, and wildland fire, salvage dead/dying forest stands from epidemic insect activity, and treat remaining stands to increase their resistance to insect activity. | Salvage/Commercial Harvest |
| Moose2 | 20 | 3 | Moosehorn | Improve forest habitat and increase resiliency to insects, disease, drought, and wildland fire, salvage dead/dying forest stands from epidemic insect activity, and treat remaining stands to increase their resistance to insect activity. | Salvage/Commercial Harvest |
| Foxtail | 175 | 26 | Foxtail | Treat Aspen to promote regeneration, Improve forest biodiversity and increase resiliency to insects, disease, drought, and wildland fire, salvage dead/dying forest stands from epidemic insect activity, and treat remaining stands to increase their resistance to insect activity. | Salvage/Commercial Harvest/Prescribed Fire |
| Little Rock | 170 | 26 | Dry Creek | Restore and/or maintain the historic density, structure, and species composition of forest and woodland habitats with emphasis in areas where aspen is declining to promote successful regeneration. | Salvage/Commercial Harvest |
| Big Rock | 306 | 46 | Jumbo Mountain | Salvage dead/dying forest stands from epidemic insect activity, and treat remaining stands to increase their resistance to insect activity. Utilize the resulting forest products where feasible. | Salvage/Commercial Harvest |
| Miner Creek | 48 | 7 | Miner Creek Unavailable | Protect WUI, Improve forest biodiversity and increase resiliency to insects, disease, drought, and wildland fire, salvage dead/dying forest stands from epidemic insect activity, and treat remaining stands to increase their resistance to insect activity. | Salvage/Commercial Harvest |

Table 2.22: Roads, Alternative C

| Unit Name | Allotments | Acres | New Temp Road (miles) | Re-Open Existing Road (miles) |
|-------------|-------------------------|-------|-----------------------|-------------------------------|
| Wild 1 | Wildwood | 84 | 0 | 0 |
| Wild 2 | Wildwood | 17 | 0 | 0 |
| Wild 3 | Mussigbrod | 48 | 0 | 0 |
| Moose1 | Moosehorn | 38 | 0.5 | 0 |
| Moose2 | Moosehorn | 20 | 0 | 0 |
| Foxtail | Foxtail | 175 | 0 | 1.6 |
| Little Rock | Dry Creek | 170 | 0.4 | 0 |
| Big Rock | Jumbo Mountain | 306 | 1 | 1.5 |
| Miner Creek | Miner Creek Unavailable | 48 | 0 | 0 |
| Total | | 906 | 1.9 | 3.1 |

2.9 Summary Comparison of Alternative Actions:

Table 2.23 Summary Comparison of Alternatives by BLM Management Unit

| Big Swamp | Alternative A | Alternative B | Alternative C |
|--|---------------|--|--|
| Livestock Number & Kind | 8 Cattle | 21 Cattle | 21 Cattle |
| Grazing Period | 6/1-10/30 | 6/10-8/31 | 6/10-8/31 |
| Active BLM AUMs | 38 | 38 | 38 |
| Grazing Management | Season-long | Deferred Rotation | Rest Rotation |
| Big Swamp Creek | Alternative A | Alternative B | Alternative C |
| Livestock Number & Kind | 15 Cattle | 133 Cattle | 75 Cattle |
| Grazing Period | 6/1-10/30 | 7/1-8/31 | 7/1-8/31 |
| Active BLM AUMs | 76 | 76 | 76 |
| Grazing Management | Season-long | Deferred Rotation | Deferred Rotation |
| Jack & Rail Fence (miles) | 0 | 0 | 2 |
| Dry Creek | Alternative A | Alternative B | Alternative C |
| Culvert Removal | 0 | 1 | 1 |
| Bridge Removal | 0 | 1 | 1 |
| Forest and Woodland Habitat Treatments (acres) | 0 | 0 | 170 |
| Travel Management | None | Un-designate ½ mile of “open” road and designate 1½ miles of 2 track road as “open” | Un-designate ½ mile of “open” road and designate 1½ miles of 2 track road as “open” |
| Inabnit Butte Unavailable | Alternative A | Alternative B | Alternative C |
| | None | Pursue opportunities to exchange or dispose of the 40 acre Inabnit Butte Unavailable Parcel. | Pursue opportunities to exchange or dispose of the 40 acre Inabnit Butte Unavailable Parcel. |

| Jumbo Mountain | Alternative A | Alternative B | Alternative C |
|--|---------------|--|--|
| Forest and Woodland Habitat Treatments (acres) | 0 | 0 | 306 |
| Foxtail | Alternative A | Alternative B | Alternative C |
| Forest and Woodland Habitat Treatments (acres) | 0 | 175 | 175 |
| Miner Creek – Sec. 1 | Alternative A | Alternative B | Alternative C |
| Forest and Woodland Habitat Treatments (acres) | 0 | 48 | 48 |
| Moosehorn | Alternative A | Alternative B | Alternative C |
| Forest and Woodland Habitat Treatments (acres) | 0 | 38 | 58 |
| Mussigbrod | Alternative A | Alternative B | Alternative C |
| Livestock Number & Kind | 11 Cattle | 11 Cattle | 11 Cattle |
| Grazing Period | 7/1-9/30 | 7/1-9/30 | 7/1-9/30 |
| Active BLM AUMs | 34 | 36 | 36 |
| Grazing Management | Rest Rotation | Rest Rotation | Rest Rotation |
| Barbed Wire Fence (miles) | 0 | 0 | 1 |
| Commercial Firewood (acres) | 0 | 48 | 48 |
| North Fork Big Hole | Alternative A | Alternative B | Alternative C |
| Livestock Number & Kind | 3 Cattle | 15 Cattle | 3 Cattle |
| Grazing Period | 5/15-11/14 | 7/1-8/31 | 5/15-11/14 |
| Active BLM AUMs | 32 | 32 | 32 |
| Grazing Management | Season-long | Riparian Pastures | Season-long |
| Barbed Wire Fence (miles) | 0 | .6 mile | 0 |
| Jack & Rail Fence (miles) | 0 | 1.15 mile | 0 |
| Administrative Actions | None | None | Include North Fork Big Hole Allotment in an assembled land exchange when the opportunity arises to obtain public lands that may be accessed by the public and possess resource values and characteristics that would be beneficial to all public land users. |
| Steel Creek | Alternative A | Alternative B | Alternative C |
| Livestock Number & Kind | 23 Cattle | 17 Cattle | 34 Cattle |
| Grazing Period | 6/15-7/31 | 10/1-11/30 | 10/1-10/31 |
| Active BLM AUMs | 34 | 34 | 34 |
| Grazing Management | Season-long | Dormant-Season | Dormant Season |
| Barbed Wire Fence (miles) | 0 | If reach 1976 has not measurably improved in three years, .6 miles will be built | 1.75 |
| Fence Removal (miles) | 0 | 0 | Future option to remove 2 miles of fence between FS and BLM administered lands and managing the Steel Creek Allotment in conjunction with FS North Steel Allotment. |

| Steel Creek | Alternative A | Alternative B | Alternative C |
|-----------------------------|---------------|--|--|
| Prescribed Fire | 0 | 74 | 74 |
| Swamp Creek Unavailable | Alternative A | Alternative B | Alternative C |
| Administrative Action | None | Pursue opportunities to exchange or dispose of the 40 acre Swamp Creek Unavailable Parcel. | Pursue opportunities to exchange or dispose of the 40 acre Swamp Creek Unavailable Parcel. |
| Warm Springs | Alternative A | Alternative B | Alternative C |
| Livestock Number & Kind | 3 Cattle | 10 Cattle | 3 Cattle |
| Grazing Period | 5/15-12/14 | 6/3-7/16 9/30-10/10 | 5/15-12/14 |
| Active BLM AUMs | 21 | 21 | 21 |
| Grazing Management | Season-long | Deferred Rotation | Deferred Rotation |
| Jack & Rail Fence (miles) | 0 | .7 miles | .7 miles |
| Administrative Action | None | Pursue opportunities to exchange or dispose of the western 40 acre parcel of Warm Springs Allotment. | Pursue opportunities to exchange or dispose of the western 40 acre parcel of Warm Springs Allotment. |
| Wildwood | Alternative A | Alternative B | Alternative C |
| Active BLM AUMs | 11 | 9 | 9 |
| Commercial Firewood (acres) | 0 | 101 | 101 |

3.0 AFFECTED ENVIRONMENT

3.1 Introduction

This chapter presents a synopsis of the potentially affected existing environment (i.e., the physical, biological, social, and economic values and resources). A detailed description of the affected environment on BLM lands in the UBHW is contained in the *Upper Big Hole River Watershed Assessment Report* which is incorporated into this document by reference. This chapter provides the baseline for comparison of impacts/consequences described in Chapter 4.

3.2 General Setting

The 770,761 acre Upper Big Hole River Watershed (UBHW) lies in the southwest corner of Montana, about 50 miles west of Dillon, Montana. Public land administered by the BLM accounts for 6,332 acres of the greater watershed or less than 1% of the total area. The public land within the UBHW generally occurs as relatively small, widely scattered parcels interspersed and managed with private, USFS, and/or state land. The largest contiguous parcel of public land administered by the BLM within the UBHW is 2,624 acres (Jumbo Mountain/Dry Creek Allotments). Fourteen of the isolated parcels are between 40 and 313 acres in size and make up a total of 1,639 acres. Three of these small parcels have no legal public access and six of the parcels can be accessed only on foot. Because of the small size and isolated nature of many of the public land parcels, livestock management options are limited to cooperation with adjacent land owners/managers or fencing to control livestock movement from adjacent lands onto the public land parcels.

The UBHW is the highest and widest of the broad mountain valleys of southwest Montana. Elevations range from 6,050 feet in the town of Wisdom, to the 10,000 foot peaks of the Beaverhead range that forms the western boundary of the watershed. The Pioneer Mountains rise to the east, and the Anaconda range to the north. Faults along the east and west sides of the valley floor have uplifted the Pioneer and Beaverhead Mountains. As these mountains have uplifted, rock and sediments have been eroded and carried by streams to be deposited as valley fill. As deep layers of valley fill accumulate, the valley is dropping along the same fault lines under the weight of the sediments. In the 1980's, two wildcat exploratory wells drilled through 14,000 feet of valley fill sediments before penetrating older bedrock below. Ice ages and glaciations have defined the characteristic U-shaped valleys found in the Beaverhead Mountains, as well as the pothole wetlands found in the Dry Creek and Jumbo Mountain allotments.

Average annual precipitation ranges from 12 inches in some areas of the valley bottom, to 50 inches in the higher elevations of the surrounding mountains.

Vegetation in the watershed reflects the diversity of ecological conditions across the landscape. The dominant plant communities and habitat types change according to soils, precipitation, elevation, slope and aspect (direction the slopes are facing). A wide variety of vegetation is found, from wetland and riparian species dependent on water and moist soils, to sagebrush and grass dominated plant communities that thrive on dryer sites.

Forested habitats cover the higher elevations. This diverse landscape provides habitat and structural niches for a wide variety and abundance of wildlife.

3.3 Key Issues Brought Forward for Analysis

3.3.1 Issue 1: Riparian, Wetland and Aquatic Habitat

Title 43 subpart 4180, section 1 Fundamentals of Rangeland Health lists ecological processes that must be supported on public lands. This section focuses on riparian, wetland and aquatic ecosystems, specifically lotic and lentic wetlands. The UBHW Assessment Report provides complete definitions of lotic and lentic wetlands as well as their functions. When functioning properly these systems perform many ecosystem benefits including, but not limited to, sediment filtering, groundwater recharge, floodwater retention, and flood mitigation.

There are approximately 12.5 stream miles on BLM administered lands in the UBHW. Six and one half stream miles (52%) are functioning properly, while six miles of stream (48%) are functional-at risk (FAR) with static or downward trends or nonfunctional.

There are approximately 900 acres of wetlands in the UBHW. Two hundred and fifty-six acres (28%) are functioning properly or FAR with an upward trend. Seventy-two percent of the BLM wetland acreage in the UBHW is FAR with static or downward trends and less than one percent of BLM wetlands are nonfunctional

Riparian-wetland conditions were not meeting or making significant progress toward proper functioning condition in the following six allotments and in one unallotted forty acre parcel: Big Swamp, Big Swamp Creek, Mussigbrod On and Off, North Fork Big Hole, Steel Creek, Swamp Creek Unavailable, and Warm Springs. The following sections provide further discussion regarding only the areas that did not meet BLMs riparian/wetland standard.

Big Swamp Allotment - Wetland 1967, Reach 1998, and Reach 1903

Big Swamp allotment is a 160 acre custodial allotment with season long grazing. Essentially, the entire allotment is a wetland with two reaches, Big Swamp Creek (reach 1903) and a tributary to Big Swamp Creek (reach 1998) meandering through it. Reach 1903 has been historically channelized and altered for more efficient agricultural use. The IDT originally assessed reach 1903 as an irrigation ditch and, considering its altered potential, determined that it was functioning properly. During the NEPA scoping process BLM Staff met with representatives from FWP, NRCS, and private landowners, and upon further consideration decided that although the channel has been altered, it is not claimed as a ditch and it is the current course of the creek. As a natural channel the IDT identified reach 1903 as FAR with a static trend. Through cooperation with the MDNRC, MFWP and private land owners, there is potential for restoration to develop natural stream channel dimensions, patterns, and profile. Big Swamp Creek originates on Forest Service Land and continues onto BLM administered land before moving onto private land. Big Swamp Creek is appropriated for irrigation through forty four appropriations dating from 1886 through 1917. Wetland 1968, in Big Swamp Creek Allotment and Wetland 1967, in Big Swamp Allotment have been impacted by these appropriations as well as historic channel alteration that shifted the channel of Big Swamp Creek south

from its historic location and away from these wetlands. Small ditches were also present, running perpendicular to reach 1903, and extending into wetland 1967. These ditches were small and shallow, and likely caused minor drying of the eastern portion of wetland 1967. Beaver dams were active prior to historic channel alteration, which supported hydrology, hydric soils and hydrophytic vegetation. Both the tributary and the wetland have been impacted by season long grazing. The stream is over-widened and has a reduced connection to its floodplain. In addition, livestock crossings and hummocking due to hoof action are increasing sediment load and sedimentation. Woody vegetation exhibits low vigor, poor recruitment and excessive decadence. No aspen recruitment was observed. The issues in this allotment are channel over-widening, channel downcutting, sedimentation, excessive hummock formation, loss of wetland hydrology (a narrowing or shrinking area of wetland), and loss of vigor of woody species. Loss of wetland hydrology due to irrigation withdrawals and altering of the historic channel is out of the control of the authorized officer. However cooperative non-regulatory options are open to exploration. Several herds of elk were observed in this area.

Big Swamp Creek Allotment - Wetland 1968 and Reaches 1902, 1965, 1966 and 1970

Big Swamp Creek Allotment is a 360 acre custodial allotment with season long grazing. It is upstream of and contiguous with the Big Swamp Allotment. Like the Big Swamp Allotment, the entire allotment is a wetland with streams meandering through it. Both wetland and streams have been impacted by livestock grazing. The streams have lost their connection to their floodplains due to over-widening and channel downcutting. There are remnants of old beaver dams throughout the system. Wetland 1968 has been impacted by irrigation withdrawals and historic channel alteration of Big Swamp Creek. As described above in Big Swamp allotment, the BLM is open to cooperative non regulatory options. The over-widened channels and livestock trailing are contributing to the lowering of the water table and the loss of hydrology. However, the primary cause of loss of wetland hydrology is from irrigation withdrawals and historic channel alteration and is outside the control of the authorized officer. In addition to the physical impacts, there was heavy utilization, decadence of woody species, and presence of facultative upland species and noxious weeds. The issues in this allotment are channel over-widening, channel downcutting, sedimentation, excessive hummock formation, loss of wetland hydrology, low vigor of woody species, and presence of facultative upland species and noxious weeds. Several herds of elk were also observed in this area.

Dry Creek Allotment – Wetland 1994 and 1964

Dry Creek Allotment met all standards; however wetland 1994 located in the NESE of section 33 T4S, R16W has been altered by trenching a section of the wetland in order to narrow the wetland to build a road across. This trenching is drying wetland 1994, allowing ground water to flow at the surface, and subsequently draining and drying the wetland and causing encroachment of Kentucky bluegrass, Shrubby cinquefoil, and Sagebrush. Wetland 1964 is located in the W½SE¼ of section 33 T4S, R16W and is bordered to the west by an irrigation ditch. This ditch is irrigating BLM land and supplementing wetland 1964. Research, using the DNRC Water Rights Query, indicated that the irrigation ditch was mapped and is shown to irrigate BLM. The discovery and resolution of suspected unauthorized irrigation systems as well as other unauthorized use and development of public lands are accomplished under the Bureau's realty trespass regulation (43 CFR Part 9230) which includes all aspects of trespass prevention,

detection, negotiation and resolution. The BLM's realty trespass regulations, in general, hold the trespasser liable for administrative costs; rental; and rehabilitation and stabilization of the lands.

Foxtail Allotment - Wetland 1912

The Foxtail Allotment met all standards, however wetland 1912 located in the NENE of Section 26 T3S, R17W showed evidence of irrigation diversion. It was recommended in the *Upper Big Hole Watershed Assessment Report* that opportunities to remove the irrigation ditch be explored. Research, using the DNRC Water Rights Query, revealed that there is at least one Statement of Claim for 210 acre-feet with the point of diversion located within wetland 1912. The Statement of Claim is for 3 cfs with the Place of Use in the NWNW of Section 25, the adjacent private parcel to the east. As water rights in the Big Hole have not been adjudicated, this recommendation is not being carried forward.

Mussigbrod Allotment - Reach 1921

Mussigbrod Allotment is a 199 acre custodial allotment that is co-managed with the USFS under a two pasture deferred rotation. Reach 1921 flows through the northwest corner of the allotment. Soils in the area are derived from granite and are highly susceptible to disturbance. The stream is overwidened and the banks are caving in. A loss in stream power, the ability of a stream to do work, especially transport its load, resulting from over-widening has increased sedimentation, which in turn has resulted in additional over-widening. Recently burned areas from wildland fires upstream from this reach, bank trampling, and hummocking have contributed substantial excess sediment to this system. The issues in this allotment are channel over-widening, channel downcutting, sedimentation, and excessive hummocking.

North Fork Big Hole Allotment - Reaches 1909 and 1923, Wetlands 1915 and 1924

North Fork Big Hole allotment is a custodial allotment consisting of two forty acre tracts which are grazed season long. The tracts lie in the bottomland associated with the North Fork of the Big Hole River. Impacts associated with livestock grazing have resulted in an overwidened channel which is disconnected to its floodplain in some areas. A loss in stream power resulting from over-widening and dewatering from private irrigation canals has reduced the stream's ability to move its sediments, which in turn is resulting in additional over-widening. The disconnect between the channel and the floodplain is resulting in a lowering of the water table and drainage with subsequent loss of hydrology in the wetlands. The issues in this allotment are channel widening and loss of wetland hydrology.

Steel Creek Allotment - Reach 1976

The Steel Creek Allotment, located east of Wisdom, is a 320 acre custodial allotment which is grazed season long. Reach 1976 is a low energy system fed by multiple springs and seeps. Headcuts were observed in this system causing the stream to have a reduced connection to its floodplain. This is resulting in a lowering of the water table and a narrowing of the riparian zone. The channel is also over-widened as compared to potential. The issues on this allotment are channel over-widening, channel downcutting, and narrowing of the riparian zone.

Swamp Creek Unavailable - Wetland 1925

Swamp Creek Unavailable is a 40 acre isolated parcel located west of Wisdom on the Gibbonsville Road. Wetland 1925 is located in the floodplain of Swamp Creek in the southeast portion of the parcel. Gibbonsville Road and an irrigation ditch dissect the tract from east to west. South of the ditch, the parcel is further divided by a barbed wire fence. The entire parcel is fenced in with private land (two different land owners). According to Statements of Claim and associated maps available at the Montana DNRC Water Right Query, it is likely that this wetland has been drained (Swanson Ditch) for irrigation since the early nineteen hundreds. The issues on this allotment caused by the draining and drying of the wetland, combined with heavy livestock use are; excessive hummocking, lack of riparian vegetation, decadence in riparian woody vegetation, presence of upland and undesirable vegetation, and poor willow recruitment. Conditions outside the control of the authorized officer are occurring on this parcel.

Warm Springs Allotment - Reaches 1900 and 1901, Wetland 1970

Warm Springs Allotment is a 320 acre custodial allotment divided into two parcels which are authorized to be grazed season long. Wetland 1970, a 17 acre wetland is located within the 40 acre western parcel and is associated with reach 1900, Warm Springs Creek. Woody Creek, reach 1901, is located in the larger eastern parcel. Warm Reach 1900 is over-widened and is losing its connection to its floodplain as well as its ability to transport its sediments. Beaver have recently abandoned their dams within this area causing the floodplain to dry and the water table to drop. Livestock impacts are contributing to an over-widened channel. Willow diversity is good, but the sedge component within the wetland is reduced. Livestock trailing on reach 1901 is causing channel widening and changes in stream morphology such that there is a reduction in stream power and the stream's ability to transport sediment leading to sedimentation. The issues in this allotment are channel widening, sedimentation, reduced sedge component, and a lowering water table.

Wildwood Individual Allotment - Reach 1922

Wildwood Individual Allotment consists of three separate parcels totaling 126 acres. The eastern 40 acre parcel is fenced in and managed with the USFS Mussigbrod Allotment, while the other two parcels are fenced in with a combination of forest and private land. Reach 1922 is a tributary of Plimpton Creek that has been impacted by cattle grazing. Bank trampling and livestock trailing have caused channel widening, excessive hummocking and sedimentation in the channel. This is a fairly low energy system, and there is likely not enough flow during spring runoff to flush the excess sediment from the stream. Issues on this allotment include channel widening, excessive hummocking, and sedimentation.

3.3.2 Issue 2: Forest and Woodland Habitat

Forested habitats comprise approximately 53% of the UBHW, and approximately 55% of BLM-administered public lands within the UBHW, according to satellite imagery. The close association of much of this forested habitat with adjoining sagebrush and riparian habitats supports a broad array of wildlife species. This habitat provides security cover for big game species and migration corridors between seasonal habitats.



Figure 1: Mixed Conifer Stand, Jumbo Mountain Allotment. August

Lodgepole pine is the dominant tree species found on BLM in the UBHW. Mature stands average 100+ years and the majority of regeneration is 50 years or less as a result of past management activities and wildfire. This has led to a mosaic of age classes in areas where activities were concentrated such as in the Rock Creek area. Several areas of the UBHW had a high hazard rating for Mountain Pine Beetle (MPB). It has been estimated that 90% of lodgepole pine over 5 inches diameter at breast height (DBH) in most forested non-treated areas have been killed in the ongoing MPB-outbreak on the Beaverhead-Deerlodge NF (Sturdevant, 2009). At present, the average basal area in previously untreated stands of mature lodgepole pine in the UBHW is 225 square feet per acre, and averages 400+ trees per acre. Areas noted with increasing MPB activity included Warm Springs, Fox Gulch Unleased, North Fork Big Hole, and Moosehorn allotments.

BLM administered lands, as well as surrounding forested private, state, and Forest Service land, are experiencing low to moderate levels of mortality from insects and disease, however, this is expected to increase due to overstocking and favorable stand conditions.

Mid-elevation forests are diverse mixed conifer, closed canopy stands dominated by Lodgepole pine and Douglas-fir. Other species present include Engelmann spruce, Subalpine fir, a few scattered Ponderosa pine, and numerous aspen stands. Whitebark and Limber pine are both major components found growing more abundantly in the higher forested elevations, typically USFS managed grounds, of the UBHW.



Figure 1: Lodgepole Stand with Dwarf Mistletoe infection (witches brooms notable here in the mid-canopy layers), Jumbo Mountain Allotment. March 2010.

After the initial assessment was completed, Dwarf mistletoe was found to be affecting all age classes of multiple lodgepole pine stands of the UBHW. Dwarf mistletoe was found to be affecting all age classes of multiple lodgepole pine stands in the UBHW. Dwarf mistletoe is a native parasitic plant that is dependent on their host species for water,

nutrients, and support (Hagle, 2003; Hawksworth, 1984). Trees of all sizes and ages can become infected when the seeds are propelled from the mature plant. Seeds can travel up to 30 feet and a sticky coating enables them to adhere to any surface they come in contact with. Infections lead to height and diameter growth reductions as well as top kill and severe branch deformities. Dwarf mistletoe shoots emerge from the infected area several years after the initial infection and will begin to produce seeds within a couple of years when the plant reaches maturity (Hoffman, 2004). As the parasite spreads throughout the limbs of the tree, growth slows, and eventually results in tree mortality. Secondary bark beetles frequently invade severely infected trees resulting in additional mortality of infected trees (Hawksworth, 1984). The Hawksworth 6-class dwarf mistletoe rating system (DMR) provides a quantitative reference scale to determine the relative population status of infestation within a stand as well as its potential for spread and intensification.

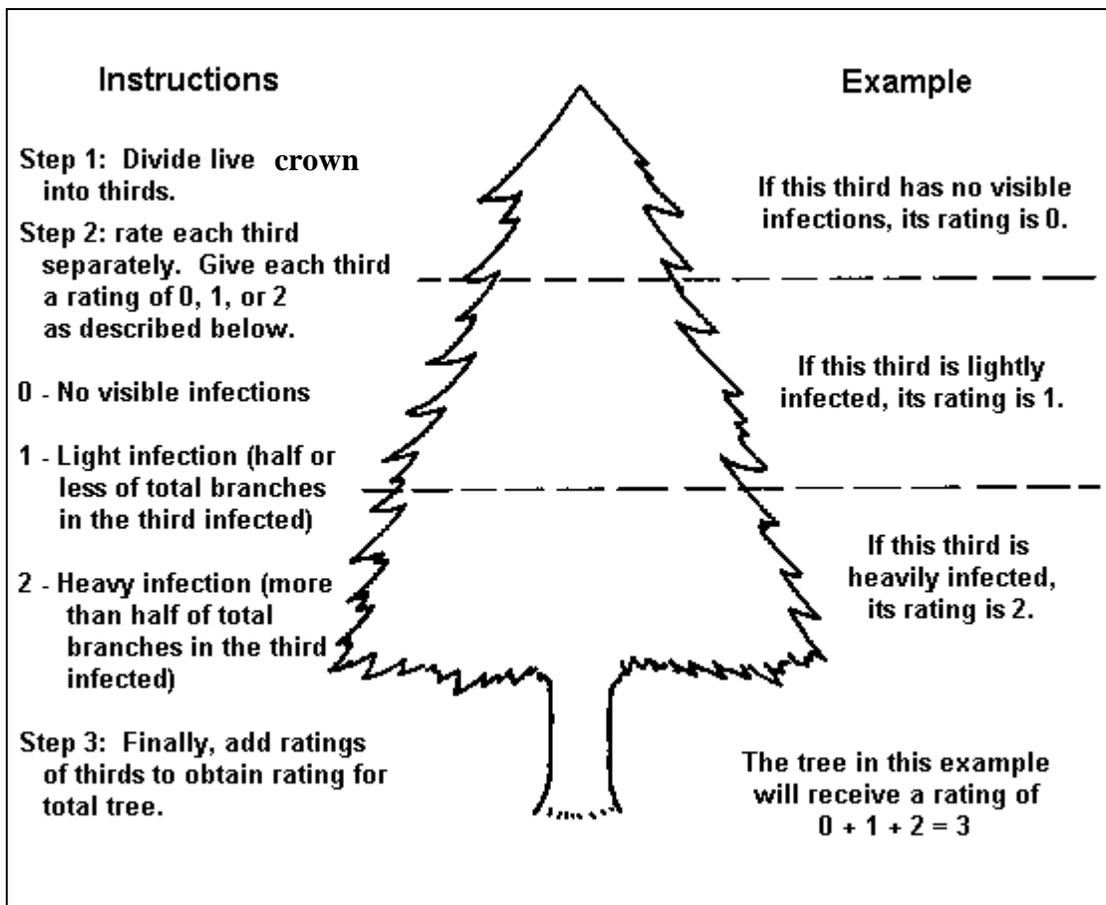


Figure 2: The Hawksworth 6-class Dwarf Mistletoe Rating (DMR) System (Hawksworth, 1984).

Forested areas dominated by Douglas-fir are primarily mature stands that average 125+ years and are considered high risk for Douglas-fir beetle outbreaks. Douglas-fir beetle, a native bark beetle, is currently at endemic population levels in the UBHW. Stands observed during the assessment with current Douglas-fir beetle activity were located in the Fox Gulch Unleased parcel and on lands adjacent to Miner Creek Unavailable parcel.



Figure 3: Aspen succession to conifers, Steele Creek Allotment, September 2009.

Conifer expansion into openings, sagebrush/grasslands, and aspen/woodlands are most evident at the low to mid-elevations of the assessment area. Douglas-fir trees found in areas of moderate to high levels of expansion were typically less than 65 years old. Steel Creek Allotment was noted with the highest levels of conifer expansion into sagebrush/grasslands. All aspen woodlands visited in the UBHW during the assessment were noted as experiencing moderate to high levels of conifer expansion.

Several of the allotments had mature aspen, but very few had sufficient aspen regeneration. In most cases where it was present, browse pressure seemed to be a contributor in the ability of seedlings to grow above browse height. Many of these areas were also experiencing mortality of the mature overstory aspen. Bartos and Campbell (1998) have classified western aspen existing primarily in three different types: (1) stable, (2) successional to conifers, and (3) decadent and falling apart. Stable aspen is considered to be functioning properly with various ages and size classes throughout the stand. It is estimated that approximately 90% of the aspen seen during the assessment were a mixture of both 2 and 3. In the allotments where aspen regeneration was noted, Wildwood Individual had the only regeneration that was above browse height.

In areas surrounding the UBHW, ponderosa pine is experiencing high levels of mortality due to mountain pine beetle and western pine beetle outbreaks. Both species usually attack the larger diameter trees, but may attack ponderosa down to 5 and 6 inch DBH, respectively. Trees are killed when they become girdled by the larvae and adults feeding on the phloem layer of the inner bark. Attacked trees will fade the following year (Hagle et al. 2003). No bark beetle activity was noted in ponderosa pine during the assessment, but these trees are susceptible to attack from MPB which is present in adjacent lodgepole pine stands. Of the ponderosa pine found, only two trees were smaller diameter co-dominant trees (8-10 inch DBH), and no seedlings or saplings were noted at any of the sites. This may indicate localized extinction (R. Means, pers. comm., 2009).

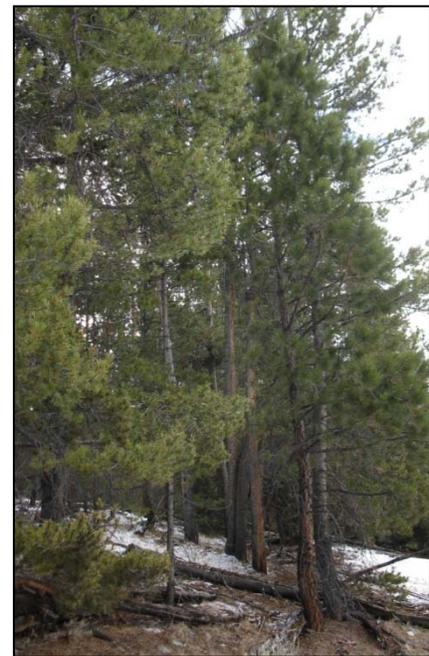


Figure 4: Ponderosa pine adjacent to lodgepole stand, Jumbo Mountain Allotment. March, 2010.

The change in forest structure, as well as increasing amounts of insect and disease activity, has led to a higher likelihood of high-intensity fires in an area that historically

experienced more frequent low-intensity fires. The increase in fuel continuity will promote fires that burn larger, more uniform areas resulting in reduced mosaic patterns of burned and unburned fuels.

3.4 Resource Concerns Brought Forward for Analysis

3.4.1 Resource Concern 1: Sagebrush Steppe Habitat

Conifers expanding into sagebrush and grassland habitats are typically less than 65 years old. The Warm Springs and Steele Creek allotments were found to be experiencing moderate to high levels of conifer expansion into sage/grasslands; and Moosehorn, Foxtail, and Dry Creek allotments were noted as experiencing low to moderate levels of expansion into sage/grasslands.

Fire suppression and the resultant increase in sagebrush and conifer canopy are believed to have contributed to the decline of Lemhi beardtongue throughout its range. The Steel Creek allotment has the only known population of Lemhi beardtongue located on BLM administered land within the UBHW.

3.4.2 Resource Concern 2: Special Status Species

Historically, westslope cutthroat trout (WCT) were found in most of the perennial streams within the UBHW. Competition and hybridization with non native species, combined with habitat loss has resulted in the extirpation of pure populations of WCT from most of their historic range within the Big Hole Drainage. The WCT in Montana is currently listed as a special status species by the State, Forest Service and BLM.

Woody Creek is currently the only stream that has a population of westslope cutthroat trout located on BLM administered land in the UBHW.

Grayling occurs almost exclusively downstream of the town of Wisdom outside most of the assessment area. Within the assessment area grayling have been documented using the lower reaches of the North Fork of the Big Hole, Warm Springs, Steel Creek, and Big Swamp Creek. Generally, tributary use is limited to areas close to their confluence with the main stem of the Big Hole, outside of BLM administered lands.

Lemhi beardtongue, a BLM sensitive plant, is discussed above under 3.4.1. BLM sensitive species Hiker's gentian and Primrose monkeyflower are discussed below under 3.5.2.

Sage grouse were listed as a candidate species to the Federal Threatened Species list on March 04, 2010. Sagebrush habitat was found to be in good condition and public lands within UBHW provide nesting and brood rearing habitat. For further discussion please refer to chapter 5 Findings and Analysis in the *Upper Big Hole Watershed Assessment Report*.

3.4.3 Resource Concern 3: Socioeconomics

The UBHW allotments cumulatively provide seasonal pasture for up to 1,900 cattle annually. UBHW allotment lessees are currently permitted to harvest 433 AUMs from BLM lands annually. Seasons of use vary by allotment and operator. Current permitted season of use and the associated AUMs are presented by allotment in Table 2-1.

Labor associated with managing cattle on the BLM allotments includes herding and doctoring cattle, supplement placement and project construction &/or maintenance. Specific costs associated with the managing cattle on the individual BLM allotments are not known and probably vary substantially.

BLM costs associated with the UBHW allotments include grazing administration (preparing applications, bills, and transfers), grazing compliance inspections, resource inventory and monitoring, project construction, modification or removal, cultural clearances for projects and preparation of reports and environmental documents.

3.4.4 Resource Concern 4: Travel Management

Motorized vehicles were limited to designated routes only in the Dillon Field Office's 2006 RMP. Some mapping errors and other issues with these route designations were discovered during the course of the field assessment for this watershed. Within the Dry Creek Allotment, mapping errors resulted in road segments that no longer exist being designated open to motorized vehicles while others that have been in recent use did not appear on the map of existing routes.

3.5 Description of Relevant Non-Affected Resources

3.5.1 Cultural Resources

In conjunction with the Mountain Foothills Grazing EIS in the late 1970s, a Class II cultural resources inventory was conducted for a 10% sample of lands within the Dillon Resource Area. Results of the sample inventory indicated that cultural site densities in the Upper Big Hole Planning Area were lower than that observed in other planning areas, with the average site density of one site for every 2.25 square miles (Earle, 1980).

An examination of existing records on file with the BLM-Dillon Field Office has provided information on the number and type of known cultural resources and level of previous cultural resource inventory conducted on public lands within the UBHW analysis area. Within the study area, approximately 2,551 acres of public land have been intensively inventoried for cultural resources at the Class III level. Inventories are subject to specific project compliance in advance of all proposed federal undertakings including: small range improvements (fences, water developments), road rights-of-way, timber sales, and land exchanges. The inventory projects vary from as little as eight acres, to as much as 1,000 acres in extent, and public lands within at least three grazing allotments have had no Class III cultural resources inventory at all.

As a result of past Class II and Class III cultural resource inventory, there are a total of four recorded cultural properties within the UBHW study area. Of that number 75% are

historic, 25% are of prehistoric. No paleontological sites are located within the watershed.

The majority of the sites associated within the study area are historic in nature, associated with homesteading or ranching. The only recorded prehistoric site type is a lithic scatter/temporary campsite. None of the sites have been formally evaluated for significance and eligibility to the National Register of Historic Places. To date, traditional cultural properties or traditional life-way values of special concern to American Indian groups have not been specifically identified within the UBHW.

Two congressionally designated National Trails also traverse through the project area in the UBHW. These include segments of the Lewis and Clark National Historic Trail and the Nez Perce (Nee Me Poo) National Historic Trail. Within the watershed, the Lewis and Clark trail segment extends from Chief Joseph Pass to Wisdom and then south to Big Hole Pass. The Nez Perce National Historic Trail extends from Chief Joseph Pass southward along the eastern edge of the Beaverhead Mountains to Skinner Meadows and into Upper Horse Prairie (USDA Forest Service, 1990).

3.5.2 Special Status Plant and Wildlife Species

Lemhi beardtongue may be affected by the alternatives and is discussed in section 3.4.1. Populations of BLM sensitive species Hiker's gentian and Primrose monkeyflower were discovered on the Foxtail and Dry Creek allotments during the field wetland health assessments. These two wetland obligate plants aren't expected to be impacted by the proposed alternatives. Idaho sedge is known from private wetlands in the Big Hole and likely occurs on BLM, but hasn't yet been confirmed from public lands within the UBHW. Additional information on special status plant species is presented in the *Upper Big Hole River Watershed Assessment Report* and in Appendix C - Biological Evaluation for Special Status Plants.

Gray wolves are currently managed as a big game species by Montanan FWP. Livestock depredations are prevalent in the UBHW by gray wolves and as a result, nearly 50 wolves were removed in the UBHW in 2009. Due to the disconnected nature of Public lands within the UBHW, requiring removal of livestock carcasses from public lands would not be effective as they would likely end up on adjoining state or private lands (pers com Nathan Lance FWP). Continued livestock grazing on public lands in the UBHW will not result in a significant increase of depredations by gray wolves.

Grizzly bear transients may occur in the watershed and unconfirmed sightings are reported on occasion, but there are no known grizzly territories established in the UBHW. Most of the suitable habitat for Grizzly bears in the UBHW occurs on Forest Service lands. Due to the substantial size of the home ranges of large carnivores and the small tracts of BLM lands in the UBHW, habitat on BLM is limited. Open road densities will not increase and there are no sheep allotments in the UBHW, therefore no impacts are expected to be associated with any alternatives.

Potential Canada lynx habitat is limited on BLM lands in the UBHW due to the small amount of public lands administered by BLM. Snow shoe hare densities appear to be low

in the UBHW thereby limiting foraging habitat for lynx. Existing BLM habitat is not large enough to support a viable lynx analysis unit (LAU) (an area the size of a female lynx home range, 10-20 sq miles) Adjoining Forest Service habitat is also not known to be occupied.

Inabnit Butte (40 acre isolated parcel with no public access) is the only place pygmy rabbits were documented on BLM lands in the UBHW. Surveys in 2009 on the remaining BLM allotments in the watershed yielded negative results. However, pygmy rabbit populations that were documented by Rauscher (1997) are currently still active on state and private lands within the UBHW.

A complete list of special status fish and wildlife species known from the UBHW is presented in the *Upper Big Hole River Watershed Assessment Report*. Additional information on special status wildlife species is presented in the *Upper Big Hole River Watershed Assessment Report* and in Appendix C - Biological Evaluation for Special Status Wildlife Species

3.5.3 Noxious Weeds

The UBHW, though not heavily impacted by noxious weeds, is an area at high risk for invasion due to the increased use of this area by recreationists. The valley is surrounded on three sides with potentially habitat altering species. Rush skeletonweed and Yellow starthistle have invaded several thousand acres of land in Idaho and currently occur near the Montana border. Blueweed, a new invader in the Bitterroot Valley, has been found on Lost Trail pass. Leafy spurge, though not a new invader to Montana, has been found on the lower Big Hole River, near Melrose.

Since 1989, BLM has been involved in cooperative control efforts with Beaverhead county, other agencies and private landowners. Throughout this period, the goal has been to prevent new noxious weed infestations and contain, control or eradicate existing infestations in the UBHW using Integrated Pest Management (IPM). These existing early detection and treatment efforts have been effective to date in preventing noxious and invasive species from gaining a foothold in the Big Hole Valley. Canada and musk thistle are present in localized areas while spotted knapweed is found in small scattered infestations around disturbances such as roads. In the summer of 1996 five St. Johnswort plants were found and treated along the Twin Lakes road near Dry creek. Annual inventory in this area since 1996 has not detected any additional plants. Cheatgrass, though not a major concern in the UBHW, is found in isolated infestations west of Wisdom in small disturbed areas, such as salt grounds.

Noxious weed species are unpalatable and/or poisonous to animals and have physiological or morphological characteristics (e.g. deep tap roots, advantageous seed dispersal mechanisms, allelopathic effects on adjacent vegetation) that give them a competitive advantage over desirable grasses and forbs. Other characteristics that make noxious and invasive species aggressive invaders are the fact that they generally germinate early in the growing season utilizing available water and soil nutrients and have few or no natural enemies giving them a competitive advantage over native vegetation. The result is that these undesirable plant species move towards a vegetative monoculture once they become established. BLM will continue to coordinate with

county, state, and federal agencies, as well as private land owners to achieve noxious weed management goals in the UBHW.

3.5.4 Air Quality

Air quality in the UBHW is excellent. All of southwest Montana is in attainment, meaning that the air resource meets or exceeds all National Ambient Air Quality Standards. The closest Montana Ambient Air Quality monitoring sites are located in Butte. The BLM is a member of the Montana/Idaho Airshed Group and is in compliance with the Environmental Protection Agency's 1998 Interim Air Quality Policy for Wildland and Prescribed Fires.

3.5.5 Recreational Opportunities and Public Access

Legal public access to BLM administered parcels is not expected to be affected by any of the proposed alternatives.

The UBHW is part of the Dillon Field Office's Extensive Recreation Management Area. (This designation applies to all lands within the Field Office that are not within a Special Recreation Management Area.) The 40 acre Doolittle Tract located along highway 43 provides public access to the main stem of the Big Hole River and is moderately used by recreationists to access the Big Hole River for floating and fishing. This area will be signed to encourage more responsible use by recreationists, and inspected more frequently to improve the public's recreational experience and reduce impacts (mostly littering) to the site.

Because of limited public access, other recreational use of the UBHW is relatively limited, except during big game hunting when it increases to relatively high levels in accessible areas. Recreational opportunities are not expected to be affected by any of the proposed alternatives.

4.0 Environmental Consequences

4.1 Introduction

This chapter discloses the scientific and analytic basis for comparison of the alternatives and describes the probable consequences (impacts, effects) of each alternative on the driving issues and resource concerns. The environmental consequences are analyzed and disclosed by alternative. This chapter also discloses the cumulative, or combined, impacts of alternative actions with past, present and reasonably foreseeable actions within the watershed.

4.2 Predicted Effects of Alternatives

4.2.1 Predicted Effects Common to All Alternatives, Including the No Action

Term Grazing Permits will be renewed with the current terms and conditions on the five allotments that were determined to be meeting Land Health Standards, had no identified site specific concerns related to current livestock grazing management, and needed no changes to facilitate improved management or accurately reflect current management. These allotments include: Doolittle Tracts, Dry Creek, Foxtail, Jumbo Mountain, and Moose Horn. Current management is facilitating/allowing healthy conditions on BLM-administered public lands within these allotments.

Human activities, such as road maintenance activities, recreation, gravel mining, and other disturbances, as well as livestock, wildlife, wind, water and fire have the potential to spread weeds into and within the watershed. Continued cooperation with Beaverhead County, other agencies and private landowners will help to limit this potential spread and eradicate new invaders before they get established.

Participation in the Continental Divide Barrier Zone project will help establish an accurate inventory of noxious weeds within the Big Hole valley. It will also provide an inventory of neighboring counties and states so that landowners and agencies within the watershed are aware of potential new invaders and the areas that may be at the highest risk for invasion.

Carefully planned monitoring under all alternatives will provide data for adaptive management within the UBHW. The monitoring plan for the UBHW is attached as Appendix B.

Most wildlife species are highly mobile and have dissimilar habitat requirements during their lifecycles. Most avian species found in the UBHW are migratory and only spend a portion of their life cycle in the UBHW. Generally this is the breeding cycle which is the most important for persistence of a species and also when these species occur in the UBHW. Under all alternatives management goals are to improve riparian and upland habitat conditions in early, mid, and late successional stages. Managing for diverse successional stages provide for the greatest biodiversity within the UBHW. Where management alternatives are anticipated to impact wildlife directly, they are discussed under the appropriate section. For further information, review the Biological Evaluation for Wildlife in the UBHW in Appendix B.

Issue #1: Riparian, Wetland and Aquatic Habitat

Riding and herding are encouraged under all alternatives including the no action. Ensuring that riders know what is expected and the reasons behind such actions is critical to success (Ehrhart and Hansen 1997). Riding and livestock management techniques such as low stress livestock management may increase the success of riding and in turn improve vegetative recovery (Cote 1999). It is stated in TR 1737-20 Grazing Management Processes and Strategies for Riparian-Wetland Areas (2006) that “Successful application of low-stress stockmanship enables the rider or range manager to control the duration that plants and soils are exposed to grazing animals. This controls overgrazing and over resting, both of which lead to deterioration of range health. Proper handling can thus improve livestock distribution and rangeland condition and trend, and it can lead to improved riparian conditions that benefit fisheries and wildlife while improving water quality.” Knowledge of livestock behavior and social dominance can improve success in herding. “...when animals are relocated, they face several life-threatening challenges: new predators, toxic plants, and unfamiliar topographic features (Provenza and Launchbaugh, 1999).” Mosley (1999) cautions, “Mere harassment often results in cattle returning within minutes or hours to their former site. Rather than trying to disperse large numbers of cattle at once, it is better to gather ...one...or a few subgroups at a time and then guide them to a new site.” Likewise, “A rider on horseback can train adult cows and their offspring to use uplands more and riparian areas less.” (Provenza and Launchbaugh, 1999).

The strategic use of temporary electric fence and livestock supplement (e.g., salt, protein block) where appropriate would distribute livestock away from riparian areas, thereby reducing impacts such as bank trampling, trailing, herbivory, and sedimentation.

Issue #2: Forest and Woodland Habitat

Public use of wood products on BLM-administered lands will result in the removal of dead/dying materials within 200 feet of existing designated open routes. Impacts of personal-use firewood gathering will be minimal. Slashing stipulations may be required in addition to the existing stipulations and regulations required by the permit. Prescribed burning of slash piles may be required to reduce slash concentrations in areas of frequent use.

Permits for Christmas trees will be issued for the removal of small size-class trees which may be taken out of the UBHW. Impacts to resources from Christmas tree harvesting will be minimal. On a very small scale, the removal of these smaller trees will make progress towards meeting management objectives to maintain existing openings by removing encroachment from sage/grassland habitats.

Throughout the UBHW, five-needled pines (limber pine and whitebark pine) will continue to decline due to mountain pine beetle and/or white pine blister rust, and may become nonexistent in some areas. Management strategies to reduce white pine blister rust are cost and labor intensive (Hagle et al, 1989). Information on treatment methods shown to effectively promote limber pine and reduce mortality from white pine blister rust are very limited (Schoettle, 2004). Individual and/or groups of 5-needled pines (limber and whitebark pines) that are suspected to be blister rust resistant and ponderosa pines will be protected from bark beetle infestation where pheromones were applied.

Funnel traps and/or pheromones may be used to repel/attract bark beetles in certain areas of the UBHW. A pesticide use proposal (PUP) will be completed for areas that were identified as at risk and in need of pheromone/funnel trap placement in order to meet management objectives.

In the areas with existing infestations of mountain pine beetle, mortality of overstory lodgepole pine will continue. During epidemics, mountain pine beetle has been noted to attack trees as small as three inches (3") DBH on the Helena and Beaverhead-Deerlodge National Forests (pers. comm. Sturdevant, 2008). As these trees die and fall over, fuel loading will be increased within the stand. Mountain pine beetle population outbreaks in lodgepole pine are usually stand-replacing events, and are usually followed by fire within 15 years following the outbreak (Samman and Logan, 2000). If the outbreak is not followed by a fire, understory conifers that are generally less fire resistant (e.g. spruce, subalpine fir) will release and become dominant in the stand. Ponderosa pine will remain susceptible to mountain pine beetle where they are near infested lodgepole pine stands.

Current Douglas-fir beetle activity is at endemic levels, but is likely to increase due to suitable stand conditions in certain areas of the UBHW. During Douglas-fir beetle outbreaks, groups of 100 dead trees or more are not uncommon (Schmitz and Gibson, 1996). Large-scale tree mortality from Douglas-fir beetle can cause degradation of wildlife habitat, increased wildfire risk, and diminished aesthetic values associated with forests (Dodds et al., 2006).

Areas currently occupied by sage/grasslands will continue to decrease due to conifer expansion. Due to conifer mortality, gradual openings of forest canopy in sagebrush habitats without fire may enhance sagebrush recovery.

Residential development is expected to continue in the area. Increasing numbers and densities of privately owned structures will result in more complex and intense fire suppression efforts in the event of a wildfire.

The management of wildland fire in UBHW will continue as defined in the Dillon RMP and the Dillon Fire Management Plan. Wildland fires managed for resource benefit will produce smoke which may affect air quality and visibility. Vegetative succession will be suppressed (set back to early seral stage species) in burned areas. Burned areas will promote overall ecological diversity.

Fuel loading will continue to increase at all elevation zones across the watershed. High fuel loads in proximity to residential development on private lands and near essential access routes will increase the cost and decrease the effectiveness of wildfire suppression efforts. High fuel loads near ingress/egress routes will affect emergency evacuation procedures.

Resource Concern #1: Sagebrush Steppe Habitat

On those grazing allotments where Standards for Land Health are being met and/or monitoring indicates an upward trend, renewing term grazing permits and leases is expected to continue meeting or making progress toward meeting the Standards and maintaining or improving resource conditions.

Removing, modifying, or rebuilding BLM fences and fences bordering BLM lands will enhance wildlife and bird movement through the area and reduce entanglement hazards. Modifications will be made to existing fences not meeting BLM specifications, which are expected to reduce barriers to wildlife movement and reduce wildlife mortality. Modification of wildlife barrier fences will improve seasonal movements by elk, mule deer, moose and antelope in specific areas within the watershed, particularly for young of all species. Adjusting wire spacing, removing wires or providing gaps will allow wildlife to pass over, under or through these fences with a reduced risk of entanglement.

Resource Concern #2: Special Status Species

Due to the limited amount of occupied grayling habitat on public land in the UBHW, the BLM will continue to provide funding to Montana FWP to conduct arctic grayling habitat restoration projects throughout the Upper Big Hole. As these projects are completed and grayling numbers increase there may be potential for grayling use within streams on public lands administered by the BLM. However due to the small amount of potential habitat affected, any improvements to habitat on BLM administered land are not expected to have any measurable effect to grayling population numbers in the watershed.

No endangered wildlife species occur within the UBHW. No measurable negative impacts are anticipated to any threatened species. Likewise, no alternative would impact BLM sensitive wildlife species that would lead to a downward trend in populations and toward federal listing.

The gray wolf population has increased in the UBHW in recent year and livestock depredations have increased proportionately. Since de-listing, MT FWP implemented a wolf hunting season in 2009. This will teach wolves to have a negative association with humans. Range riders can also reduce conflicts between livestock and wolves (Smallidge et al. 2008). Amending grazing permits to state that livestock losses may occur from wolves will create awareness, and help minimize conflicts between lessees and agencies responsible for managing the wolf population.

Conducting field inspections to search for special status plants prior to authorizing surface disturbing activities, mitigating adverse impacts through project abandonment or redesign, and restricting activities that disturb minerals soil within the boundaries of special status plant populations will protect known and potential undiscovered populations of special status plants from disturbance, trampling, and habitat fragmentation.

Inventoring and mapping of Lemhi beardtongue, Hiker's gentian, and Primrose monkeyflower populations on BLM administered land will provide a baseline to determine future trends of population size, health, and impacts.

For further discussion regarding sensitive species, see the Biological Evaluation in Appendix C.

Resource Concern #3: Socioeconomics

The BLM does not have access to financial or business records for lessees authorized to graze livestock on allotments included in this EA. Therefore, it is impossible to provide a

detailed or quantifiable discussion of individual ranch operations or economic conditions. The 2010 BLM AUM cost is \$1.35 while private land lease rates in Montana for 2010 average \$18.00/AUM. Current realty and livestock market trends, as well as expense trends related to livestock grazing will continue under all alternatives.

Current market trends for forest and woodland products, as well as expenses affecting those trends will not be affected by any of the alternatives.

Economic impacts to businesses and commercial outfitting operations in the area are not expected to be affected by any of the alternatives.

Refer to Chapter 4 on page 302 and Table 56 on page 286 in the Dillon Proposed RMP and Final EIS for further information.

Resource Concern #4 Travel Management

Public demand for access and use the public lands in the UBHW will continue to increase, especially during the hunting season. Implementation of the travel management plan in the Dillon Field Office RMP (2006) will discourage the creation of new vehicle routes on public lands. This strategy limits the spread of noxious weeds and motorized vehicle-caused soil erosion on public lands.

Recreational motorized vehicle users will continue to benefit from the signing of designated open routes, which will aid navigation in remote backcountry areas of public lands.

4.2.2 Predicted Effects of Alternative A - No Action (Continuation of Current Management)

Under the No Action Alternative, site-specific objectives would not be met and some allotments would continue being out of conformance with the Standards for Rangeland Health (43 CFR 4180).

Key Issue #1: Riparian, Wetland and Aquatic Habitat

The No Action Alternative would continue to maintain or improve existing resource conditions along 6.5 miles of streams and 256 acres of wetlands that were rated PFC under existing management. Along 6 miles of stream reaches and 644 acres of wetlands where resource concerns were identified, this alternative would not accomplish riparian, wetland, or aquatic objectives.

Negative impacts to riparian, wetland, and aquatic resources including alteration of stream morphology, loss of wetland hydrology, reduced cover, structure and vigor of riparian species, conifer encroachment, and excess sediment input would continue at current or greater levels under the no action alternative.

Key Issue #2: Forest and Woodland Habitat

The No Action Alternative would leave forest and woodland habitats undisturbed by the treatments proposed in the action alternatives. Current conditions and forest trends would continue until interrupted by natural events, insects and disease, or changes in weather or climate.

The density, structure and species composition of forest stands would continue to depart from historic conditions without a natural disturbance regime. High density conifer stands would have increased susceptibility to insect and/or disease infestations and subsequent mortality. These conditions would lead to a decrease in forest health and an increase in fuel loading, and the potential for more severe impacts from wildland fire throughout forested areas of the UBHW.

Fire behavior would progress toward a long-interval stand-replacement fire regime. This could reduce vegetative diversity on the landscape and may reduce values for wildlife habitat, watershed protection, and esthetics (Arno, 2000). Aspen would continue to decline without disturbances favoring new regeneration and/or the removal of encroaching conifers. Conifer encroachment into sage/grassland and aspen woodland habitats would continue and it is likely that aspen may become nonexistent in some areas. As stated in Hyerdahl et al (2006), “in the continued absence of fire, mountain big sagebrush and grasslands in southwestern Montana are likely to become more homogeneous as Douglas-fir trees continue to encroach.”

Forested habitat and security cover for wildlife would decline throughout all timbered BLM lands in the UBHW under Alternative A as mortality increases. Mule deer and elk security cover use would be reduced, although increased forage availability may compensate for this loss in some areas dependent on other disturbances. Use by bird species favoring a more open habitat would increase as well as black backed and three-toed woodpecker due to the increase in beetle larvae found in the infested trees. Alternatively, those requiring denser forested canopies would decline. Forest dwelling birds of prey would experience some nesting habitat loss although prey base may increase. The surrounding Forest Service habitat is still providing the bulk of the habitat for these species in the UBHW.

Loss of overstory canopy cover, as a result of fire and/or insect and disease mortality, may cause short term displacement of big game species such as moose, deer and elk. However, increased forage production and palatability that typically follows fire and the opening of the forest canopy would lure big game species back into burned areas.

Resource Concern #1: Sagebrush Steppe Habitat

Upland health standards were being met on all allotments in the UBHW. Under alternative A, current conditions and trends would continue. The upland condition on the Swamp Creek Unavailable parcel did not meet upland health standards, and would remain non-functional under Alternative A. All other unallotted parcels met upland health standards and current conditions and trends would continue under Alternative A.

Resource Concern #2: Special Status Species

The no action alternative would not meet the habitat needs of WCT in Woody Creek, and would likely result in the loss of this WCT population primarily as a result of non native brook trout competition and predation. In addition, the recent redistribution of livestock use due to new fencing to manage arctic grayling habitat in adjacent streams on private land is not compatible with maintaining WCT in Woody Creek. The recently constructed fence on private land within the allotment is concentrating livestock along Woody Creek.

This change in use would have an increasingly negative impact on WCT habitat conditions as increased trailing would degrade bank stability and stream bank vegetative communities and increase the amount of sediment entering the stream which would negatively impact spawning success.

Without changes to land management to improve stream conditions on the North Fork of the Big Hole River, Big Swamp and Warm Springs Creek, it is unlikely that these areas would become suitable or occupied grayling habitat.

Populations of all special status wildlife species are expected to persist under the no action alternative as current management was not having and measurable negative effects. For further discussion refer to the UBHW Wildlife Biological Evaluation in Appendix B.

Lemhi beardtongue, hikers gentian, and primrose monkeyflower populations would be expected to persist under the no action alternative. Populations of these species would be monitored as described in Appendix B, and would provide baseline and trend data for the known populations on BLM lands.

Resource Concern #3: Socioeconomics

Under Alternative A, forage availability and the number of authorized AUMs are expected to continue at current levels and economic contributions attributed to livestock use of BLM-administered lands would continue at current levels. Livestock grazing on 5,900 acres of public lands would provide 433 AUM's of forage on 12 grazing allotments in Beaverhead County. The dependency of livestock operators on BLM forage would remain unchanged. Forage on BLM administered land often provides a critical element of the livestock producer's matched complement of grazing, forage, and hay production. Since there would be no change in the authorized level of grazing use, this would not contribute to changing the real estate value of base properties.

Without treatment, there would be no removal of forest products, and the economic value of the timber resource would not be recovered. Under the No Action Alternative, there would be no short-term job opportunities created to treat forests and woodlands on BLM-administered lands and there would be no additional opportunities for public utilization of wood products.

Socioeconomics was analyzed in further detail for the Field Office under Alternative A in Chapter 4 (p 316) of the Proposed Dillon RMP and Final EIS.

Resource Concern #4 Travel Management

Under the No action alternative the bridge over stream reach 1904 would continue to pose a public safety concern. The road mapping error in the Dry Creek Allotment would continue to confuse and frustrate public land users and public access would not be enhanced (section 4, T5S, R16W and section 33, T4S, R16W).

4.2.3 Predicted Effects Common to All Action Alternatives

Disposing of three 40 acre tracts of BLM in Land Adjustment Category 3, Swamp Creek and Inabnit Butte Unavailable parcels and the BLM 40 acre tract in the Warm Springs Allotment would result in an opportunity to block up Public Land in other areas of the field office. While this would not address the resource concerns on these acres, it could potentially result in more opportunity for the BLM to manage resources on Public Land. In the interim, opportunities to improve resource conditions through advocacy, cooperation and education with local and state partners, such as the Big Hole Watershed Committee, the Big Hole Foundation, and Montana DEQ will continue.

The grazing flexibility provision would provide the BLM and affected lessee's tools to more efficiently manage the herbaceous resources on public lands. Having the ability to respond to annual variations in precipitation and forage production would be practical and ecologically sensible. Flexibility is the hallmark of successful range management in arid regions. Strict adherence to animal numbers and livestock movement dates without regard to variations in precipitation and forage production can be counterproductive to both rangeland and livestock production. Adjust stocking rates and rotation dates so that livestock numbers are in balance with forage supply (Howery, 1999). Riparian and upland health would benefit with more applicable timing of resource use.

Key Issue #1: Riparian, Wetland, and Aquatic Habitat

All action alternatives have been developed to address site specific objectives and are expected to have positive effects on composition of riparian vegetation due to dietary preference and selectivity of forage in relation to the No Action Alternative.

Revised grazing systems included in the action alternatives were generally developed in cooperation with the grazing permittees in order to increase support in implementation and success in meeting resource objectives. Ehrhart and Hansen (1997) selected 71 reaches on private land which were either functioning properly or functioning with problems, but exhibited an upward trend. Some general conclusions associated with successful management of riparian areas suggest that what operators do to encourage livestock not to loiter in the riparian zone is more important than either season of use or length of time in the pasture. Ehrhart and Hansen (1998) acknowledge that there are "numerous techniques available for developing and implementing an appropriate prescription to address any given riparian ecosystem." The only required ingredient which portends potential success was "serious commitment and personal involvement on the part of the operators and managers." Alternatives developed in consultation with affected permittees have an improved chance for success. Revised livestock management is predicted to improve riparian vegetation, stream channel morphology and sediment transport at varying degrees and timeframes in relation to the No Action alternative. Grazing treatments proposed for managing livestock across allotments and alternatives in the Upper Big Hole Watershed include: late spring, hot season, fall and winter treatments using deferred or rest rotation systems. Each of these combinations of treatments and systems has positives and negatives (Elmore 1992). Regardless of treatment, however, case studies, controlled experiments, and common experience all confirm that, unless discouraged from doing so, cattle tend to spend a disproportionate amount of time in the riparian portion of any pasture.

While different opinions exist within the scientific community regarding the best season of use, there is consensus that the length of time animals spend in a riparian area is a significant factor in the condition of that area. According to Marlow and his colleagues (1991), “The most critical aspect in any grazing plan for the protection of riparian areas is the length of time cattle have access to a particular stream reach.” Extended grazing during the hot summer season is generally considered most injurious to riparian zones (Ehrhart and Hansen 1997).

Utilizing use guidelines as tools to indicate livestock movements would help improve overall watershed conditions along with the proposed management changes. This analysis is based on the assumption that these allowable use levels and associated livestock rotations are employed in a timely manner. A four or six inch sedge stubble height guideline (as applicable) would benefit stream channel morphology by reducing impacts to streambanks and deep rooted riparian vegetation in most areas, but is not expected to initiate significant progress toward meeting PFC on its own. Clary and Leininger (2000) recommend a four inch residual stubble height as a starting point for improved riparian grazing management while acknowledging that six inches of stubble height may be required to reduce browsing of willows or limit trampling impacts to vulnerable streambanks. Annual use guidelines would slow or reduce excessive wetland hummocking and drying where irrigation withdrawals are not excessive. Improvements in stream channel morphology and reduced impacts to streamside wetlands would reduce sediment input associated with channel degradation.

An upward trend in cover, structure, and vigor of riparian vegetation as well as increased streambank stability is expected on streams that were FAR or NF where additional rest, deferment, and/or reduced duration of use is proposed.

Impacts from commercial timber harvest and forest health treatments would come primarily in the form of soil erosion and sediment runoff from increased activity within units, construction and use of skid trails, construction of temporary roads, re-opening of existing roads, and prescribed burning in order to consume residual slash. Under Alternative B, 484 acres would be treated, requiring the construction of .5 miles of temporary roads and the re-opening of 1.6 miles of existing roads. Under Alternative C, 980 acres would be treated, requiring the construction of 1.9 miles of new temporary roads and the re-opening of 3.1 miles of existing roads. Use and maintenance of BMP’s would mitigate the effects of increased runoff and minimize erosion thus reducing the likelihood of sediment entering streams. No stream crossings are proposed.

Following conifer removal treatments (commercial timber harvest, non-commercial mechanical, and prescribed fire), there would be a positive herbaceous vegetative response which would reduce the amount of bare ground and reduce the potential for erosion and runoff. Resting pastures for at least two growing seasons where prescribed burning has occurred would allow herbaceous growth to stabilize soil within treated areas.

Constructing a corridor fence along reach 1901 (Woody Creek) would exclude livestock from impacting the stream through trailing, bank trampling, and overgrazing of herbaceous riparian vegetation. With the corridor fence, Woody Creek is expected to

make steady progress towards PFC, including increase in riparian vegetation and vigor of riparian vegetation, channel narrowing, and an expanding riparian area. Willow pruning associated with electro-fishing is expected to have rapid re-growth of pruned woody vegetation.

The BLM's cooperation with partners including MDNRC, NRCS, MFWP and private landowners would allow for opportunities to restore reach 1903 in the Big Swamp allotment to its natural stream dimensions, profile and pattern.

Removing the culvert above wetland 1994 and plugging and filling the ditch at wetland 1994 would improve the connectivity between the wetlands and result in restoration of hydrology to wetland 1994.

Mussigbrod #20750 and Wildwood Individual #30250 Allotment Boundary Adjustment

The Public Lands portion of the original Mussigbrod Allotment is located in Section 18, T1S, R16W. A quarter section in the NW corner of Section 10 T1S, R16W, formerly part of Wildwood Individual, is fenced in and managed with the USFS Mussigbrod Allotment and would be added to Mussigbrod 20705. Reach 1922, a tributary of Plimpton Creek, and wetland 199 located within this 40, would be managed in the Mussigbrod Allotment. Changing the allotment boundaries would accurately reflect management on the ground and would improve administration of both of these allotments.

Utilizing FS Interim Grazing Standards on the Mussigbrod Allotment would limit the streambank disturbance to 30 percent or less as measured by reach and require a minimum 4 inch stubble height be left on riparian species along the greenline and 3 inches on the floodplain. This would reduce livestock impacts and is expected to result in stabilization of streambanks and expansion of the riparian area. Channel response would lag behind vegetation response, but over time channels would narrow and deepen. The water table would rise, supporting further expansion of the riparian zone. Stream condition would improve more quickly as riders become more familiar and gain proficiency in the implementation of FS grazing standards.

Key Issue #2: Forest and Woodland Habitat

Current stand conditions have areas of dead trees that provide less hiding and thermal cover than is provided by live trees. Cover would decrease further with proposed treatments; however, similar effects would occur without treatment due to additional mortality. Wildlife species composition would change in localized areas from those preferring more dense vertical cover and structure to those favoring more open habitats. Nesting habitat would be reduced for birds of prey, but additional foraging habitat would be created due to a more open canopy and the creation of small mammal habitat in downed materials and slash piles. There are no documented Northern Goshawk nests on BLM-administered lands in the UBHW; however, inventory would be completed on an annual basis in all proposed treatment units to determine presence. If surveys conclude that there is activity in proposed units, timing limitations on harvest activities would be utilized to mitigate potential disturbances during the breeding season.

Removing the dead trees now would allow for new trees to establish more rapidly and would increase herbaceous understory. Post-treatment herbaceous vegetation would be dominated by grasses and forbs, which would attract increased wildlife use and shift elk use from private lands in the valley, reducing conflicts with the landowners. These conditions would favor increased elk use as well as other sagebrush/grassland dependent species. All forest treatment units would allow for screening cover for big game along roads unless the stand has an aspen component that is targeted for restoration. This would provide for screening to reduce sighting distances and to deter hunters from shooting from roadways during hunting seasons.

Herbaceous vegetation would increase within all forest and woodland habitat treatment areas. The BLM does not intend to increase authorized livestock use as a result of increased herbaceous vegetation. However, it is expected there would be increased ungulate use in the treated areas because of the increase in palatability as well as production of herbaceous vegetation. This would change distribution and use patterns of herbivory (both wild and domestic) within the affected allotments for five or more years. There may be a short term increase in soil erosion within treated areas, but the long term effect would be decreased soil erosion due to increased cover of herbaceous vegetation.

The use of temporary roads and/or skid trails to complete harvest activities would result in localized soil compaction within treatment areas. Design features for road construction and maintenance would be performed in accordance with State of Montana BMPs and SMZ Law and Rules to a minimum standard necessary for the removal of products and safe travel operations. Using standard timber sale contract provisions which address protection from erosion, sedimentation, and soil compaction would minimize these impacts. Limiting operations to frozen or reasonably dry road conditions that would not result in rutting greater than six inches deep, and completing preventive maintenance at the end of each hauling season to minimize weather damage to roads would decrease the potential for erosion and sedimentation associated with road construction.

Physically closing roads using berms and slash is anticipated to effectively prevent use by motorized vehicles. Utilizing right-of-way debris to close roads in the Dillon Field Office has been a useful tool for over 15 years with nearly 100% success in prohibiting unauthorized road use. Physically closing new temporary roads would allow for future entry by maintaining the road prism with proper long term drainage, allows for faster re-vegetation by not disturbing the established vegetation, and keeps post treatment sediment movement to a minimum.

Disturbances within treatment areas have the potential to facilitate the spread and/or introduce noxious and invasive species. Weed monitoring/treatment would be ongoing during the period of use for temporary roads. The requirement to pressure wash equipment prior to entering the project area, as well as completing monitoring for a minimum of three years post-harvest would mitigate this potential.

Treatments would result in short term effects which would diminish as vegetation responds to new conditions. Commercial harvest and salvage would decrease intrastand competition on the areas treated and would increase moisture available due to the change in forest structure. Snow and rainfall interception would be decreased which would result

in an increase in infiltration and runoff. Data from 95 watershed experiments conducted in the United States shows that, on average, streamflow increases by nearly 2.5 mm for each percent of watershed harvested (Troendle, et al. 2006). Commercial and salvage harvest treatments would be implemented in four and seven Level 6 hydrologic units for Alternatives B and C, respectively. These treatments would impact less than 1% in each of the affected Level 6 hydrologic units within the watershed. Treatments would increase the potential for runoff, erosion, sediment yield, and water yield. However, the reduction on basal area and the percent change in forest would be well below the threshold for detectable change. Post-harvest stands would have increased availability of water and nutrients due to decreased competition, which would improve tree vigor and resistance to insects and/or disease.

Conifer treatments would increase the amount of sunlight available to the aspen, as well as the understory vegetation. Enhanced and improved aspen stands would benefit large carnivores, ungulates, and migratory birds which use this habitat. The removal of conifers from within and around aspen stands and the use of prescribed fire would revitalize these stands for a 20 to 50 year period. The placement of slash and other non-merchantable material within and or around these aspen stands would help protect aspen regeneration from browsing on a localized basis. This has been found to be effective in reducing ungulate browse pressure on at least one past salvage sale treatment within the UBHW. Ground based yarding would further enhance aspen regeneration response by disturbing the aspen root system and promoting sprouting.

Proposed treatments would result in an increase in the short term and long term diversity of seral stage and FRCC rating distributions of forested habitats on BLM administered lands in the UBHW. In lodgepole pine stands, openings created by patch cuts with small patches of trees within them would increase the structural diversity. Treatments would reduce the MPB hazard and DMR ratings in lodgepole pine stands, resulting in a new cohort of lodgepole pine seedlings in these openings which would have low mistletoe infection and would not be susceptible to mountain pine beetle activity at endemic levels for the next 80 years. Creating breaks in continuous stands would decrease the potential for widespread stand replacing wildfires and enhance suppression opportunities. Implementing treatments which increase structural diversity of forest types would decrease the potential for large-scale epidemic infestations. Salvage and thinning treatments on the BLM alone would have limited effect on the current mountain pine beetle epidemic because the majority of activity is occurring above BLM administered lands on the Forest Service.

The use of prescribed fire within treatment units post harvest may be utilized. Areas would be broadcast and/or pile burned to obtain the residual slashing target of 5 to 20 tons per acre, or where disturbances to aspen may benefit from fire.

Burning of slash materials may result in short term air quality deterioration. During prescribed fire season, the Smoke Monitoring Unit supports the Montana/Idaho Airshed Group to prevent/reduce the impact of smoke on area communities, especially when it could contribute to a violation of national air quality standards.

Typical treatments involve some time between felling of trees and slash disposal, usually from less than one, up to several summer seasons. During this time, potential fire behavior is increased. Proposed treatments would reduce long term fuel loading to resemble levels similar to historical conditions in areas treated. The net effect would be a decrease in intensity and rates of spread of wildfire within the treated area. Reducing fuels would improve the effectiveness of wildfire suppression efforts. Removal of standing dead trees would reduce material that could be recycled by fire and/or biological breakdown, as well as some of the small mammal habitat that would be provided. However, the removal of standing dead trees would also reduce the potential for soil sterilization that could occur during the summer fire season due to the exceptionally high fuel loading.

Whether or not sub-merchantable materials are removed for biomass utilization, the stipulation to retain 5 to 20 tons of slash per acre would be sufficient for long-term nutrient recycling and small mammal habitat. The larger remaining slash material (generally 3" and greater) following prescribed burning would create microsites of shading and moisture retention.

Units Moose 1 and Miner Creek were found within the Wildland Urban Interface (WUI). The implementation of fuel reduction treatments would reduce fuel loading and create buffer areas to slow or eliminate wildfire spread onto private property. Treatment unit locations were strategically identified to protect private lands near BLM administered land and to provide fire managers maximum fire suppression flexibility. Active management on the landscape scale that includes a mix of thinning, surface fuel treatments, and prescribed fire with proactive treatment in areas with high risk to wildfire is the best general approach for mitigating wildfire damage (Graham et al, 1999). The action alternatives propose differing levels of treatment in forest and woodland habitats. Areas untreated in these alternatives would have similar effects to those described under Alternative A, the No Action Alternative.

The action alternatives would make varying amounts of progress toward fulfilling goals and actions of the Forest and Woodland Vegetation and Forest Products section in the Record of Decision and Approved Dillon Resource Management Plan.

Resource Concern #1: Sagebrush Steppe Habitat

Under current management, utilization of forage plants was generally found to be less than 50% on BLM-administered upland sites within the UBHW. For those uplands where site-specific concerns were identified, implementing an annual utilization guideline of 50% utilization on cool-season bunchgrasses, to help determine pasture moves, would enhance herbaceous plant community cover and composition. Earlier grazing treatments may allow sufficient time for plant re-growth while later deferred treatments may enhance seedling establishment and species composition. Utilization patterns within a pasture are not uniform and livestock-preferred areas would generally sustain higher levels of use while other areas may receive less utilization. Livestock distribution is influenced by distance from water, topography and season of use. Improvements in cover would improve infiltration, and reduce soil erosion, overland sediment transport, and sediment delivery to streams. Deferring livestock use until after

the growing season mitigates grazing impacts to cool-season bunchgrasses and reduces trampling of forbs.

Existing improvements would remain permanent features within the watershed. Construction of new fences may impede wildlife movement. Following BLM Handbook H-1741-1 specifications for constructing wildlife friendly fences and livestock enclosures would reduce entanglement hazards for birds, elk, mule deer, antelope, and moose. Modifying and building fences around springs or tanks that prevent avian predators from using posts as hunting perches would provide safer sage grouse brood-rearing habitat when the birds are foraging on forbs in these areas.

Treatments to reduce conifer encroachment into sagebrush would result in short-term change within sagebrush habitat, converting these sagebrush/forested areas to a grassland aspect, with a minor forest canopy. Recovery of sagebrush habitat would facilitate the BLM's goals and objectives of maintaining and improving sagebrush/grassland habitat. Based on past prescribed fires in the watershed, it would take at least 30 years to move through early and mid seral stages to get back to current sagebrush cover within this 74 acre treatment. By creating a mosaic in the sagebrush canopy more edge is created and removing the conifer encroachment would maintain this open park for future use. A 74 acre prescribed fire is minimal within the UBHW. This habitat currently provides summer sage grouse use and an increase in forb production would provide for sage grouse foraging. An increase in elk use is also expected within the unit after the burn treatment during green up and winter forage would be improved as well.

Results of a five year monitoring study, *The Effects of Fire on Lemhi Penstemon (Penstemon Lemhiensis)* conclude that "the use of fire as an appropriate habitat restoration tool in *Artemesia Tridentata*- dominated habitats where *Penstemon Lemhiensis* faces competition due to past fire suppression." The proposed burn would reduce the cover of sagebrush, thereby releasing water, nutrients and sunlight to dormant seeds that have accumulated in the seed bank. There would be a positive response including an increase in seedlings and resulting population increase. Robust Lemhi beardtongue plants were observed within one mile of the proposed burn unit within areas that recently burned on USFS land.

Resource Concern #2: Special Status Species

The proposed actions for the WCT population in Woody Creek are essential for preservation of this population. A proactive non native brook trout removal effort and fish barrier installation would improve the viability of the WCT population. Minor stream clearing is required to allow complete access to the stream channel for efficient electrofishing and netting efforts. Past pruning projects of this nature have shown rapid re-growth of pruned woody vegetation. The construction of a stream corridor fence would provide protection to the riparian area from livestock use. This would provide additional benefit to the WCT population by improving the habitat conditions including stream bank stability, increased willow density and a reduction in sediment to the stream as bare banks become vegetated.

Inventorying and monitoring populations of Lemhi beardtongue, Hikers gentian, and Primrose monkeyflower would provide baseline data for future trend monitoring and

provide BLM the information to appropriately manage the habitat associated with these rare plant species.

Resource Concern #3: Socioeconomics

The economy in Beaverhead County is highly dependent on agriculture, primarily the livestock industry. The jobs and tax revenue generated by livestock associated activities plays a major role in fueling the economy of southwest Montana. The inter-mixed lands including private, BLM administered and State of Montana creates a woven ownership pattern on which many livestock producers have been dependant for decades to effectively run a livestock operation. Alternatives that the BLM Authorized Officer selects, including management changes, changes to grazing permit authorizations and structural projects to improve a resource concern often have a financial impact on the BLM grazing permittee and cumulatively on Beaverhead County’s economy. These impacts are considered and balanced with the alternative’s ability to effectively mitigate resource concerns and make progress towards meeting resource objectives.

A variety of projects are proposed on BLM-administered lands to improve land health. Table 4.1 summarizes the proposed projects on all BLM-administered grazing allotments by alternative. Alternative B proposes projects on seven different grazing allotments, while Alternative C proposes projects on nine allotments. The actual costs associated with implementing these projects are not presented, due to fluctuating prices of materials and labor and the contribution of materials and labor provided by the permittee/lessee, which can vary from one project to another. For grazing-related projects, the BLM generally provides the materials and the permittee/lessee constructs (i.e., provide labor) the project to BLM specifications. The permittee/lessee would also incur long-terms costs associated with maintenance of the grazing-related projects.

Table 4.1: Summary of Proposed Projects on All Grazing Allotments by Alternative

| Proposed Project | Alternative B | Alternative C |
|---|----------------------|----------------------|
| New barbed wire fence construction, including riparian exclosures/ pastures (miles) | .6 | 2.75 |
| New jack and rail fence construction, including riparian exclosures/ pastures (miles) | 1.85 | 2.7 |
| Fence removal (miles) | 0 | 2 (optional) |
| Bridge Removal (units) | 1 | 1 |
| Culvert Removal (units) | 2 | 2 |
| Un-designate road (miles) | .5 | .5 |
| Designate roads (miles) | 1.5 | 1.5 |
| Commercial firewood harvest (acres) | 149 | 149 |
| Forest and Woodland Habitat Treatments (acres) | 261 | 757 |
| Prescribed Fire (acres) | 74 | 74 |
| Land Exchange or Disposal (acres) | 120 | 200 |

Alternatives B and C propose differing levels of treatment in forest and woodland habitats. Implementing commercial harvest treatments and allowing permitted removal of wood products would recover the economic value of the timber resource before it is lost due to mortality and decay, create short term employment opportunities, and provide opportunities for public utilization of wood products.

Resource Concern #4 Travel Management

Removing the unauthorized bridge across reach 1904 would improve public safety and closing the route shown on Map 3 would accurately reflect the situation on the ground as well as reduce impacts to resources from vehicular travel. Designating an additional 1½ miles of 2-track roads as open in sections 4 (T5S, R16W) and 33 (T4S, R16W) would improve public access within this area (Dry Creek Allotment) and reduce unauthorized road use.

4.2.4 Predicted Effects of Each Action Alternative (B and C) by Grazing Allotment

For each grazing allotment or unallotted parcel presented below, the predicted effects of each action alternative are presented for the issues and/or resource concerns in the following order and are arranged accordingly:

Issue # 1: Riparian, Wetland and Aquatic Habitat
Issue # 2: Forest and Woodland Health

Resource Concern # 1: Sagebrush Steppe Habitat
Resource Concern # 2: Special Status Species
Resource Concern # 3: Socioeconomics
Resource Concern # 4: Travel Management

These headings are omitted under those allotments within which certain issues and/or resource concerns are not present, or are present, but not affected or previously addressed under section 4.2.3, Predicted Effects Common to All Action Alternatives.

Due to the continuous nature of Forest and Woodland Health, analysis was not conducted on an allotment by allotment basis. For Issue #2, Forest and Woodland Health, the predicted effects of each action alternative are analyzed on a unit by unit basis in section 4.2.5.

Big Swamp # 10141 Alternative B

Issue # 1: Riparian, Wetland, and Aquatic Habitat

Alternative B would shift grazing from season long (June 1 to October 30) to deferred grazing (June 10 to August 31) for 21 to 42 days alternating between early season and late season. The grazing season in June/July in the Big Hole would compare to spring grazing and late season grazing (July/August) would most closely associate with hot season grazing.

Spring use normally results in better livestock distribution between riparian and upland areas (USDI 2006) and provides opportunity for regrowth and plant recovery before dormancy. In a ten year study on Stanley Creek in central Idaho with light to medium late spring use, improvements were found in stream channel morphology. Channels narrowed, width depth ratios were reduced and channel bottom embeddedness decreased.

Willow communities increased in height and cover as well as species richness.(Clary 1999).

Limiting the duration of hot season grazing and removing livestock early provide for herbaceous regrowth and floodplain function. In a study of 34 grazing systems in SW Montana, 9 were considered to be successful. Successful systems averaged 12.5 days of hot season riparian grazing and 34.9 days of regrowth (Myers 1989). Myers concluded, “duration in grazing treatments becomes a key factor in determining the severity of damage.”

Shifting grazing from season long to deferred grazing for 21 to 42 days (depending on herd size) would be expected to decrease impacts to streambanks and use on riparian vegetation. As stated earlier in Impacts Common to all Action alternatives the amount of time livestock spend in riparian areas is one of the most critical elements in any grazing plan. Twenty-one days with 80 head would be more beneficial than 42 days with 40 head. Vegetation would be expected to respond fairly quickly on reaches 1998 and 1903. Channel restoration typically lags vegetation response, as multiple flood cycles are necessary to restore dimensions, patterns and profiles. Restoration of hydrology is uncertain as irrigation withdrawals, which are outside the control of the authorized officer, are not expected to change in the short term. Cooperative efforts among landowners may have positive results over the long term. The BLM is a willing partner in these efforts and would support restoration of reach 1903.

Resource Concern #2: Special Status Species

As potential grayling habitat improves on stream reaches on the Big Swamp Allotment as a result of grazing management changes, habitat could potentially support fluvial grayling occupation. However, in order for this to take place substantial improvement to stream conditions downstream, and in some cases upstream, of public land would need to occur. Without improvements to downstream habitat it is unlikely that grayling would naturally occupy additional stream reaches located on BLM administered public land.

Alternative C

Issue # 1: Riparian, Wetland, and Aquatic Habitat

Shifting grazing from season long to rest rotation grazing for 21 to 42 days alternating between early and late season, and then resting for a year would be expected to decrease impacts to streambanks and use on riparian vegetation. Channel response and vegetation response over time would be similar to Alt B, with channel response lagging vegetation. Channel and vegetation response would likely move towards PFC over a shorter period of time under this Alternative. As with Alt B, restoration of hydrology is uncertain as irrigation withdrawals, which are outside the control of the authorized officer, are not expected to change in the short term. Cooperative efforts among landowners may have positive results over the long term. The BLM is a willing partner in these efforts and would support restoration of reach 1903.

Resource Concern #2: Special Status Species

Predicted effects to grayling habitat under Alternative C would be similar to Alternative B and would be closely tied to riparian habitat improvements.

Big Swamp Creek #20715

Alternative B

Issue # 1: Riparian, Wetland, and Aquatic Habitat

Alternative B would shift grazing from season long (June 1 to October 30) to deferred grazing (July 1 to August 31) for 16 to 30 days alternating between July during even years and August during odd years. The grazing season during July in the Big Hole would most likely compare to early summer grazing. August 10 to 31 would most closely associate with hot season grazing. Effects of spring grazing are described in more detail under alternative B of Big Swamp.

In a ten year study of spring grazing on Stanley Creek in central Idaho channels narrowed, width depth ratios were reduced and channel bottom embeddedness decreased. Willow communities increased in height and cover as well as species richness.(Clary 1999). Myers (1989), in a study of 34 grazing systems in SW Montana, found successful systems averaged 12.5 days of hot season riparian grazing and 34.9 days of regrowth (Myers 1989). Myers concluded, “duration in grazing treatments becomes a key factor in determining the severity of damage.”

Shifting grazing from season long to deferred grazing alternating between July during even years and August during odd years would decrease impacts to streambanks and use on riparian vegetation. Woody species would be expected to exhibit more vigor. Narrowing and deepening of channels as well as development of appropriate dimensions, patterns and profiles would require multiple years of flood cycles and would lag vegetative response. Sixteen days with 500 head would be more beneficial than 30 days with 270 head. As stated earlier in Impacts Common to all Action alternatives the amount of time livestock spend in riparian areas is one of the most critical elements in any grazing plan. Restoration of hydrology is uncertain as irrigation withdrawals, which are outside the control of the authorized officer, are not expected to change in the short term.

Resource Concern #2: Special Status Species

As potential grayling habitat improves on stream reaches on the Big Swamp Creek Allotment as a result of grazing management changes, habitat could potentially support fluvial grayling occupation. However, in order for this to take place substantial improvement to stream conditions downstream, and in some cases upstream, of public land would need to occur. Without improvements to downstream habitat it is unlikely that grayling would naturally occupy additional stream reaches located on BLM administered public land.

Alternative C

Issue # 1: Riparian, Wetland, and Aquatic Habitat

This alternative involves the construction of two miles of jack and rail fence to facilitate the creation of two pastures. Construction of two miles of fence along the southern boundary of the BLM lands would result in short term impacts including as removal of woody riparian species such as willow, alder, and bog birch, as well as compaction and potential erosion of wetland soils. Abundant riparian vegetation would be expected to naturally reclaim the site. Managing the BLM lands in a two-treatment deferred rotation, alternating between July one year and August the following year, and shortening the

season of use would decrease impacts to streambanks and use on riparian vegetation. As described in Alt B, channel response would lag vegetative response. Nine days with 500 head would be more beneficial than 31 days with 150 head, as described above. Restoration of hydrology is uncertain as irrigation withdrawals, which are outside the control of the authorized officer, are not expected to change in the short term.

Construction of jack rail fence has fewer impacts for wildlife crossing than steel and wire as it eliminates the entanglement hazard for big game. The benefit of fencing to control livestock use on Big Swamp creek to improve habitat conditions mitigates the negative of having increased miles of fencing in the UBHW.

Resource Concern #2: Special Status Species

See Predicted Effects resulting from Alternative B above.

North Fork Big Hole #10742

Alternative B

Issue # 1: Riparian, Wetland, and Aquatic Habitat

Fencing the 40 acre tracts along the North Fork of the Big Hole would facilitate the ability of natural processes to occur in reaches 1909 and 1923. Since streams are self forming and self maintaining, the channel is expected to return over time to more stable dimensions, patterns and profiles. Reducing livestock impacts is expected to result in stabilization of streambanks and expansion of the riparian area due to reduced bank trampling, trailing, and use deep rooted of riparian species. Channel response will lag vegetation, but over time channels should narrow and deepen. The water table would rise supporting further expansion of the riparian zone. The isolated nature of these reaches coupled with upstream and downstream conditions such as sedimentation, increased bedload, and channel dimension would continue to be reflected as the channel evolves.

Wetlands 1915 and 1924 would benefit as they are closely associated with stream reaches 1909 and 1923. As the water table rises in response to reduced livestock use and stabilization of the stream channel, wetland hydrology would improve as the floodplain becomes more accessible to the stream. Native species would increase as grazing pressure is reduced.

Fencing would be beneficial to the riparian resource, but constructing almost two miles of fence for 80 acres of habitat would create barriers for big game movements. Approximately 1.15 miles would be wooden jack and rail fence and the remainder steel and wire would be to BLM specifications to reduce entanglement hazards.

Resource Concern #2: Special Status Species

As potential grayling habitat improves on stream reaches on the North Fork Big Hole Allotment as a result of grazing management changes, habitat could potentially support fluvial grayling occupation. However, in order for this to take place substantial improvement to stream conditions downstream, and in some cases upstream, of public land would need to occur. Without improvements to downstream habitat it is unlikely that grayling would naturally occupy additional stream reaches located on BLM administered public land.

Alternative C

Issue # 1: Riparian, Wetland, and Aquatic Habitat

Disposing of these tracts could result in an opportunity to block up Public Land in other areas of the field office. While this would not address the resource concerns on these acres, it could potentially result in more opportunity for the BLM to manage resources on Public Land. In the interim, opportunities to improve resource conditions through advocacy, cooperation and education with local and state partners, such as the Big Hole Watershed Committee, the Big Hole Foundation, and Montana DEQ will continue, but the impaired conditions of the wetlands and stream reaches would likely persist.

For wildlife resources, this alternative would be the most beneficial to obtain habitat with similar values that has public access, although resource concerns identified along the North fork of the Big Hole may not be addressed.

Steel Creek # 10743

Alternative B

Issue # 1: Riparian, Wetland, and Aquatic Habitat

The Steel Creek Allotment is currently authorized to be grazed during June and July every year. Shifting grazing from late spring/early summer (June 15 to July 31) to dormant season (winter) grazing (October 1 to November 30) would decrease impacts to streambanks and improve livestock distribution. Cattle congregate less in creek bottoms during colder months (Elmore 1992, Masters et al. 1996). Masters and her associates examined some cases of successful winter grazing. Along Meadow Valley Wash, winter grazing proved successful in restoring streamside vegetation and building new channels within previously downcut sections. Winter grazing is expected to produce similar results on Steel Creek.

Resource Concern #1: Sagebrush Steppe Habitat

Implementing a prescribed burn on 74 acres to mimic a natural disturbance and maintain the open sagebrush park by reducing conifer encroachment would be beneficial to return the area to a Condition Class 1 and create a baseline for a historical Fire Regime. Managing habitat for varying successional stages is important for maintaining the biodiversity in the UBHW. For further discussion refer to the Wildlife Biological Evaluation in Appendix B.

Resource Concern #2: Special Status Species

Refer to the Wildlife Biological Evaluation in Appendix B

Alternative C

Issue # 1: Riparian, Wetland, and Aquatic Habitat

Steel Creek is a low energy system fed by multiple springs and seeps. Fencing Steel Creek and shifting grazing from summer (June 15 to July 31) to fall grazing (October 1 to October 31) would reduce impacts to streambanks. The stream channel would narrow and deepen over time. The floodplain connection would gradually be restored and the water table would rise. Wildlife and livestock shift preference from grasses and forbs to woody vegetation in the fall. Limiting grazing to 15 days would reduce browse on woody riparian vegetation.

Resource Concern #1: Sagebrush Steppe Habitat

Same as Alternative B, Refer to the Wildlife Biological Evaluation in Appendix B

Resource Concern #2: Special Status Species

Refer to the Wildlife Biological Evaluation in Appendix B

Warm Springs #20596

Alternative B

Issue # 1: Riparian, Wetland, and Aquatic Habitat

Warm Springs Allotment is divided into two parcels which are authorized to be grazed season long. Dividing the Warm Springs allotment into two pastures, Woody and Warm Springs, and shifting grazing from season long (May 15 to December 14) to an 18 day deferred rotation would reduce impacts to streambanks and riparian vegetation, as well as hasten recovery of natural channel dimensions, patterns and profiles and facilitate expansion of woody riparian vegetation in the Warm Spring Pasture.

The riparian zones associated with Warm Springs Creek and Woody Creek would expand, the stream channels would narrow and deepen, and the floodplain connections would be restored. Water tables would rise.

Predicted effects resulting from corridor fencing Woody Creek are discussed above under 4.2.3 Resource Concern #2 Special Status Species. Grazing management changes in the Woody Creek Pasture would have no effect on riparian conditions along Woody Creek since it would be corridor fenced and excluded from livestock grazing.

Alternative C

Issue # 1: Riparian, Wetland, and Aquatic Habitat

Disposing of the isolated 40 acre tract would result in an opportunity to block up Public Land in other areas of the field office. While this would not address the resource concerns on these acres, it could potentially result in more opportunity for the BLM to manage resources on Public Land. In the interim, opportunities to improve resource conditions would be the same as Alternative B.

4.2.5 Predicted Effects of Each Action Alternative (B and C) by Forest Treatment Unit

For each forest treatment unit below, the predicted effects of each action alternative are presented for the issues and/or resource concerns in the following order and are arranged accordingly:

Issue # 1: Riparian, Wetland and Aquatic Habitat
Issue # 2: Forest and Woodland Health

Resource Concern # 1: Sagebrush Steppe Habitat
Resource Concern # 2: Special Status Species
Resource Concern # 3: Socioeconomics
Resource Concern # 4: Travel Management

These headings are omitted under those units within which certain issues and/or resource concerns are not present, or are present, but not affected or previously addressed under section 4.2.3, Predicted Effects Common to All Action Alternatives.

Alternative B

Under Alternative B, up to 410 acres of Forest and Woodland Habitat would be treated. Approximately 15% of forested BLM land and approximately 9% of the total BLM land in the UHBW would be treated. Commercial and salvage harvest treatments would be implemented in four Level 6 hydrologic units. These treatments would impact less than 1% in each of the affected Level 6 hydrologic units within the watershed. Treatments would increase the potential for runoff, erosion, sediment yield, and water yield on a short term basis. However, the reduction on basal area and the percent change in forest would be well below the threshold for detectable change.

Units identified include; Wild 1 (84 acres), Wild 2 (17 acres), Wild 3 (48 acres), Moose 1 (38 acres), Foxtail (175 acres), and Miner Creek (48 acres). The construction of up to 0.5 miles of new temporary road and re-opening up to 1.6 miles of existing road would be required to complete treatments in Alternative B. Predicted effects of treatments under Alternative B are described in Section 4.2.3 Predicted Effects Common to All Action Alternatives. Site specific Predicted Effects by Unit are described below.

Wild 1, Wild 2, & Wild 3

Issue # 1: Riparian, Wetland, and Aquatic Habitat

Following SMZ Best Management Practices would prevent, minimize, or mitigate impacts to reaches 1920 and 1921. Utilizing existing roads would minimize disturbance and potential for compaction, overland flow, and erosion.

Issue #2, Forest and Woodland Health

Impacts associated would be similar to those identified for personal use firewood gathering, but would occur in a more concentrated area. Ground disturbance would be increased with the use of to 4-wheelers, horses, and small tractor equipment. Prescribed fire may be needed following commercial firewood harvest to consume slash left in the units. Harvest of firewood materials would allow for the public utilization of materials that would be otherwise lost to decay.

Resource Concern #2: Special Status Species

Refer to the Wildlife Biological Evaluation in Appendix B

Moose 1

Issue # 1: Riparian, Wetland, and Aquatic Habitat

Construction .5 miles of new temporary road would increase the risk of sedimentation and erosion immediately adjacent to the road. Stream reach 1992 is the closest downstream reach and is sufficiently buffered with vegetation to eliminate potential for sedimentation. Following Best Management Practices would prevent, minimize, or mitigate impacts, to the wetlands located within this unit.

Salvage and Commercial Harvest would reduce risk of catastrophic wildfire and the associated risk of excessive erosion and runoff rates. Groundwater infiltration would be improved as forest canopy is opened, reducing losses due to evapotranspiration.

Issue #2, Forest and Woodland Health

Treatments would require the construction of up to 0.5 miles of temporary road for the removal of wood products. Hazards associated with the spread of wildfire to adjacent private lands would be reduced on a localized level. Commercial and salvage timber harvest would recover wood product value that would be lost without treatment due to mortality and decay from mountain pine beetle activity.

Resource Concern #2: Special Status Species

Refer to the Wildlife Biological Evaluation in Appendix B

Foxtail

Issue # 1: Riparian, Wetland, and Aquatic Habitat

Salvage and commercial harvest, as well as prescribed fire within the Foxtail unit would reduce the risk of catastrophic wildfire and the associated risk of excessive erosion and runoff. Reach 1911 is Class 1 stream, joining with Yank Swamp Creek and flowing to the Big Hole River north of Wisdom. SMZ rules state that on Class 1 streams that have valley side slopes of less than 35%, the SMZ boundary is 50 feet, or to the edge of any associated wetlands that extend beyond 50 feet. Given the gentle slope of the site, a 50 foot minimum would provide an adequate buffer against sedimentation from harvest operations.

Issue #2: Forest and Woodland Health

Implementation would require that up to 1.6 miles of existing road be re-opened. Because the existing road was physically closed after previous harvests were completed in the area, additional localized sedimentation within unit boundaries may occur when the road surface is refinished to accommodate harvest activities. Commercial and salvage timber harvest would recover wood product value that would be lost without treatment due to mortality and decay from mountain pine beetle activity. The post treatment stand would be varying sizes of leave patches that also have varying size classes. Live aspen clones within the unit would be targeted for disturbances including prescribed fire, slash piling, and/or ground scarification which would favor aspen sprouting. This unit has areas that are wet for most of the year and restricting harvest activities to frozen or completely dry conditions would mitigate the amount of soil disturbance and compaction within the unit.

Resource Concern #2: Special Status Species

Refer to the Wildlife Biological Evaluation in Appendix B

Miner Creek

Issue #2: Forest and Woodland Health

Hazards associated with the spread of wildfire to adjacent private lands would be reduced on a localized level. Commercial and salvage timber harvest would recover wood product value that would be lost without treatment due to mortality and decay from mountain pine beetle activity. Post-treatment, the stand would consist of open and

widely spaced mature Douglas-fir mixed with a component of smaller diameter lodgepole pine.

Resource Concern #2: Special Status Species

Refer to the Wildlife Biological Evaluation in Appendix B

Alternative C

All units identified in Alternative B would be carried through for treatment under Alternative C. Treatments under Alternative C would total up to 906 acres. Approximately 31% of forested BLM land and approximately 17% of the total BLM land in the UHBW would be treated. Commercial and salvage harvest treatments would be implemented in seven Level 6 hydrologic units. These treatments would impact less than 1% in each of the affected Level 6 hydrologic units within the watershed. Treatments would increase the potential for runoff, erosion, sediment yield, and water yield in the short term. However, the reduction on basal area and the percent change in forest would be well below the threshold for detectable change.

Units identified in addition to those identified in Alternative B include; Moose 2 (20 acres), Little Rock (170 acres), and Big Rock (306 acres). Predicted effects of treatments under Alternative C are described in Section 4.2.3 Predicted Effects Common to All Action Alternatives, and in Predicted Effects by Unit for Alternative B above. Site specific Predicted Effects by Unit for Alternative C are described below.

Moose 2

Issue # 1: Riparian, Wetland, and Aquatic Habitat

Salvage and commercial harvest, as well as prescribed fire within the Moose 2 unit would reduce the risk of catastrophic wildfire and the associated risk of excessive erosion and runoff. According to SMZ rules, reach 1920 is a Class 1 stream. SMZ rules state that on Class 1 streams that have valley side slopes of less than 35%, the SMZ boundary is 50 feet, or to the edge of any associated wetlands that extend beyond 50 feet. Given the gentle slope of the site, a 50 foot minimum would provide an adequate buffer against sedimentation from logging operations. Following Best Management Practices would prevent, minimize, or mitigate impacts to the wetlands located within this unit.

Issue #2: Forest and Woodland Health

Commercial and salvage timber harvest would recover wood product value that would be lost without treatment due to mortality and decay from mountain pine beetle activity. Post treatment, the stand would be open with smaller diameter lodgepole and aspen leave patches.

Resource Concern #2: Special Status Species

Refer to the Wildlife Biological Evaluation in Appendix B

Little Rock

Issue # 1: Riparian, Wetland, and Aquatic Habitat

Reach 1904 and associated wetland 1963 border this unit to the north. Salvage and Commercial Harvest would reduce risk of catastrophic wildfire and the associated excessive erosion and runoff rates. According to SMZ rules, reach 1920 is a Class 1

stream. SMZ rules state that on Class 1 streams that have valley side slopes of less than 35%, the SMZ boundary is 50 feet, or to the edge of any associated wetlands that extend beyond 50 feet. Given the gentle slope of the site, a 50 foot minimum would provide an adequate buffer against sedimentation from logging operations. Following Best Management Practices would prevent, minimize, or mitigate impacts to the wetlands located within this unit.

Groundwater infiltration would be improved as forest canopy is opened, reducing losses due to evapotranspiration and facilitating more herbaceous vegetation recruitment into these openings.

Issue #2: Forest and Woodland Health

Implementation of treatments in the unit would require the construction of up to 0.4 miles of new temporary road for the removal of wood products. Commercial and salvage timber harvest would recover wood product value that would be lost without treatment due to mortality and decay from mountain pine beetle activity. Post-harvest, the stand would consist of more widely spaced individuals and/or groups of ponderosa pine, Douglas-fir and spruce trees, intermixed with patches of varying age classes of lodgepole pine. Competing conifers would be cut within 40 feet of Douglas-fir and ponderosa pine leave trees greater than 18" DBH. This would increase vigor of these mature trees and reduce their susceptibility to insect and disease infestations.

Disturbance to existing patches of lodgepole pine seedlings and saplings would be minimized, and these patches would provide hiding and thermal cover for some species of wildlife. These young patches of lodgepole would not be susceptible to mountain pine beetle for the next 40 to 80 years. Opening small patches in or around Engelmann spruce would promote a younger cohort of this species and increase stand diversity in this forest type. By removing trees which are weakened and more susceptible to damaging insects and improving environmental conditions in the stand, resistance to insect populations would increase (Furniss et. al, 1979). Throughout the stand, fuel loading would be decreased, and the treatment would increase horizontal structural diversity and improve growing conditions for residual trees.

Resource Concern #2: Special Status Species

Refer to the Wildlife Biological Evaluation in Appendix B

Big Rock

Issue # 1: Riparian, Wetland, and Aquatic Habitat Salvage and Commercial Harvest would reduce risk of catastrophic wildfire and the associated risk of excessive erosion and runoff rates. Situating leave patches to provide linkage corridors and screening cover between potholes would provide vegetative buffering and maintain microsite conditions directly adjacent to pothole wetlands. Following Best Management Practices would prevent, minimize, or mitigate any impacts, such as soil compaction, within this unit.

Groundwater infiltration would be improved as forest canopy is opened, reducing losses due to evapotranspiration and facilitating more herbaceous vegetative cover in the openings.

Issue #2: Forest and Woodland Health

Implementation of treatments within this unit would require that up to 1.5 miles of existing road be re-opened. Because portions of the existing road were physically closed after previous harvests were completed in the area, additional localized sedimentation within the unit boundaries may occur when the road surface is refinished to accommodate harvest activities. Commercial and salvage timber harvest would recover wood product value that would be lost without treatment due to mortality and decay from mountain pine beetle activity. Post-harvest, the stand would consist of more widely spaced individuals and/or groups of ponderosa pine, Douglas-fir and spruce trees, intermixed with patches of varying age classes of lodgepole pine. Competing conifers would be cut within 40 feet of Douglas-fir and ponderosa pine trees greater than 18" DBH. This would increase vigor of these mature trees and reduce their susceptibility to insect and disease infestations.

Disturbance to existing patches of lodgepole pine seedlings and saplings would be minimized, and these patches would provide hiding and thermal cover for some species of wildlife. These young patches of lodgepole would not be susceptible to mountain pine beetle for the next 40 to 80 years. Opening small patches in or around Engelmann spruce would promote a younger cohort of this species and increase stand diversity in this forest type. By removing trees which are weakened and more susceptible to damaging insects and improving environmental conditions in the stand, resistance to insect populations would increase (Furniss et. al, 1979). Throughout the stand, fuel loading would be decreased, and the treatment would increase horizontal structural diversity and improve growing conditions for residual trees.

Resource Concern #2: Special Status Species

Refer to the Wildlife Biological Evaluation in Appendix B

4.3 Cumulative Effects for All Alternatives

Cumulative effects are those that result from adding the anticipated direct and indirect effects of the proposed action, to impacts from other past, present and reasonably foreseeable future actions. These additional impacts are considered regardless of what agency or person undertakes such actions. The Cumulative Impacts Area for this EA includes all lands within the greater UBHW assessment area (see Appendix A – Map 1). The temporal boundary when analyzing cumulative impacts is 10 years.

4.3.1 Past and Present Actions

Past or ongoing actions that affect the same components of the environment as the proposed action are:

- Severe over-trapping of beavers and unregulated livestock use during the late 1800s and early 1900s changed the character (hydrologically and vegetatively) of most mountain streams in the Intermountain West (Elmore and Beschta 1987; Elmore and Kaufman 1994; Naiman 1988). Currently, beaver colonies are active

in every major drainage in the UBHW, but beaver activity is reduced from historical levels.

- In the late 1890s and early 1900s, wolves and other large predators in the western United States were hunted, trapped and poisoned. The removal of large predators increased the level of impact that elk and moose historically had on riparian areas (Ripple and Beschta 2004a, 2004b, 2005a, 2005b). Recent increases in wolf numbers in SW Montana may have an effect on reversing this.
- Exclusion of fire from the landscape (e.g. removal of fine fuels by livestock, coupled with fire suppression over the past century), has resulted in the increase in accumulation of fuel loads and reduced forest health.
- Watershed-wide, under all management schemes on all land ownerships, there has been and continues to be a decline in aspen. This is a west wide phenomenon that can be attributed primarily to a combination of successional processes including reduction (or elimination) of fire, loss of predator influence on herbivores, and long-term overuse by ungulates (Bartos and Campbell 1998; Beschta 2003; Ripple and Beschta 2004a, 2004b) and drought.
- There has been timber harvest, pole cutting, Christmas tree cutting, and firewood collecting in the past throughout the watershed.
- Elk and moose populations in southwest Montana have increased over the past 20-25 years, primarily as a result of light snow conditions during fall and winter. Currently in the UBHW elk numbers are within objectives, but had been under objectives the past five years. Moose numbers have been relatively low in recent years while antelope numbers are on the rise in the UBHW.
- Livestock and wildlife impacts on lands upstream from BLM-administered land may contribute sediment to streams and subsequently may adversely affect downstream water quality on public land.
- The economic situation of the grazing permittees/lessees is affected by changes in livestock prices, hay prices, fuel prices, interest rates, land prices, labor costs, labor inputs, equipment costs, equipment maintenance costs, facilities maintenance costs, costs of feed supplements, irrigation costs and availability of irrigation water, livestock loss, private land lease rates, veterinary costs, local weather and other miscellaneous factors. Cumulative economic impacts to permittees could add pressure to permittees to subdivide private land to maintain a cash flow.
- Historic irrigation practices have resulted in the construction of irrigation ditches as well as channel alterations that have removed vegetation and beaver dams, lowered water tables and altered hydrology. Floodplains have been disconnected from stream channels. Streams altered by straightening are no longer self forming self maintaining channels. Sediment transport is disrupted, channels are widened and stream power is reduced.
- In an effort to preclude listing of the fluvial arctic grayling under the ESA and/or to protect private land owner rights in the event of listing, the Candidate Conservation Agreement with Assurances (CCAA) program is currently being implemented on non-federal lands in the Upper Big Hole Watershed. To date, two-thirds of the private landowners within the watershed have signed up for the CCAA program. This includes 32 private landowners and over 160,000 acres. This effort includes many partners, including the BLM who provides funding. This cooperative effort is resulting in constructing structural projects, completing

vegetative projects, and implementing grazing systems on private land, as well as voluntary reductions in water use. More conservative irrigation practices are also being implemented.

- Approximately 954 acres of commercial timber harvest has occurred on State of Montana lands in the UBHW during the past 30 years.
- Approximately 1,164 acres of commercial timber harvest has occurred on forested BLM-administered lands in the past 40 years.
- The total estimated forested area treated on USFS-administered lands in the past 60 years is approximately 42,750 acres across the watershed. Silvicultural treatments include, but are not limited to; fire salvage, clearcut, selection cut, sanitation cut, hazard tree removal, commercial thin, and special products removal.
- The Big Hole Battlefield has implemented an estimated 50 acres of thinning since 2003, and has applied pheromones for Douglas-fir Beetle on approximately 145 acres annually.
- The introduction of non native trout into the watershed in the 1900's has resulted in the loss of nearly all native WCT populations through hybridization, competition and predation from the non native species.
- Degradation of riparian habitat, competition from non native fish, changes in water use, and climate change have all combined to greatly reduce the amount of habitat for fluvial grayling and substantially reduce the numbers of grayling in the Big Hole River and its tributary streams
- Historic water rights for irrigation purposes are greater than water available. The Montana Department of Natural Resources and Conservation is currently working on water right adjudication within the UBHW with the goal of reconciling water availability with water rights.

4.3.2 Reasonably Foreseeable Action Scenario (RFAS)

The following RFAS identifies reasonably foreseeable future actions that would cumulatively affect the same resources in the cumulative impact area as the proposed action and alternatives.

- As the cumulative effects of the grayling CCAA program on non-federal lands and efforts to improve potential habitat on public land begin to mature, the predicted results of rising water tables, reconnected floodplains, streams capable of self maintenance of channel dimensions, and lower water temperatures, would lead to improvements to fluvial arctic grayling habitat and potentially a corresponding increase in the population. This would result in expanded use of previously unoccupied habitats throughout the drainage. The non-federal lands included in the CCAA program will be re-assessed every five years to measure progress towards objectives and adjustments to management made as indicated.
- The risk of wildfire on all ownerships will continue. Fire suppression efforts, utilizing resource benefit objectives, will continue on federally-administered lands in the watershed.
- Fencing on other land ownerships and on BLM boundaries may lessen the benefit of fence modification efforts on public lands to improve wildlife movements.

- Recreation, especially hunting, is expected to increase in the UBHW in the future. Impacts expected from this increased use are new camp sites, spreading of weed seed, more use of roads and increased wildlife disturbance.
- The discovery and resolution of suspected unauthorized irrigation systems as well as other unauthorized use and development of public lands are accomplished under the Bureau's realty trespass regulation (43 CFR Part 9230) which includes all aspects of trespass prevention, detection, negotiation and resolution. The BLM's realty trespass regulations, in general, hold the trespasser liable for administrative costs; rental; and rehabilitation and stabilization of the lands. These cases (actions) will be completed on a prioritized schedule by the Land and Realty program within the BLM Dillon Field Office.
- Sub-dividing of private land within the watershed is currently occurring on a very small scale. Although not expected to be extensive, subdivision may expand in the foreseeable future. Sub-dividing and development cause's habitat fragmentation and increases traffic, soil and vegetation disturbance, spread of noxious and invasive species, and other human uses in the area, and may increase the demand for water.
- There are two aspects to climate change, impacts to climate change and impacts from climate change. The BLM expects only minor changes, likely positive, with regard to impacts to climate. In fact, given current technology, any change would likely be undetectable. Regarding impacts from climate change, there is a great deal of uncertainty over what to expect during the life of the AMPs. While the long-term (100 year) trend clearly shows warming, local climatic records show great variability for any particular fifteen year window. This would make any analysis of short-term impacts from climate change purely hypothetical. While it would be nearly impossible to accurately predict short-term climatic conditions, the land health standards remain relevant during either warm/dry or cool/wet periods.
- Increasing loss of aspen due to the succession to conifers and/or the expansion of conifers can be anticipated. In areas that are treated to enhance and maintain existing habitats would create structural diversity within aspen/woodland habitats across the landscape.

4.3.3 Cumulative Effects of Alternative A – No Action (Continuation of Current Management)

Without grazing management changes and new range improvement projects, livestock induced riparian health concerns on BLM administered lands identified in the UBHW Assessment Report would not be addressed and objectives for improving riparian health would not be accomplished. Static or downward trends would continue along 6 miles of stream reaches and 644 acres of wetlands which could affect riparian health, fisheries and wildlife habitat in localized areas.

The loss of forest canopy and cover due to insect and disease mortality is likely to continue across all ownerships with the accompanying loss of wildlife habitat. As fuel loading increases due to conifer mortality, it will create a higher risk of catastrophic wildfire, especially while the needles are dead, but still on the trees.

4.3.4 Cumulative Effects of All Action Alternatives

Managing to improve riparian conditions throughout the watershed would allow for better dispersal of wildlife and reduce site specific riparian impacts. The proposed changes in livestock management would generally improve riparian function on BLM-administered land and other lands within BLM allotments at varying degrees and timeframes. The expected effect to these riparian habitats would be improved sediment transport, better access to floodplains, dissipation of energy and, over time, improvements in channel morphology and fisheries habitat. Since BLM administered lands comprise less than 1% of the land base within the UBHW, improvements to riparian condition and water quality on BLM administered lands alone, would not have a measurable effect on water quality within the larger UBHW.

The intermingling of private and state lands with public lands throughout the watershed ensures that activities outside the control of BLM will continue. Grazing on these lands at various times throughout the year will influence forage and cover availability, and distribution of seasonal wildlife uses. Although wildlife habitat needs are generally met within the watershed, this grazing may influence suitability and availability of that habitat on a localized basis or during a specific time frame.

The implementation of the selected alternative would maintain or improve the ability of these areas to perform their physical and biological functions including carbon sequestration. This would be an improvement to the current situation. The application of the land health standards requires that they are met regardless of climatic conditions. The alternatives in this EA do not authorized additional livestock, therefore, the limited emissions associated with livestock digestion and excretion would not increase from current levels. Proposed alternatives and projects are not expected to cause negative impacts to climate change, and a reduction in net emissions as rangeland conditions improve would be expected.

Even if conditions improve to pristine grayling habitat on the stream reaches crossing public land (which is the BLM's goal), it is unlikely in the short term that fluvial grayling would occupy these stream reaches. The reaches discussed above are located relatively long distances from currently occupied habitat. Large stretches of degraded unoccupied habitat exist between public lands and current occupied habitat. As the current trend in riparian and fisheries habitat continues on non-federal, as well as federally managed land, and is followed by an increase in grayling numbers, it may be possible for grayling to re-occupy BLM administered public lands in the upper Big Hole drainage.

Without additional proactive cooperative projects between private, state and federal agencies, such as Woody creek, it is likely that WCT will be extirpated from the Upper Big Hole drainage in the next 10-20 years. Projects like the one proposed on Woody Creek will help, but should only be considered as a stop gap measure until larger scale projects can take place to increase the distribution of this native species throughout the watershed.

Commercial and salvage harvest treatments would be implemented in seven Level 6 hydrologic units. These treatments would include less than 1% of the area in each of the affected Level 6 hydrologic units within the watershed. Treatments increase the potential for runoff, erosion, sediment yield, and water yield in the short term. However, the reduction in basal area and the percent change in forest would be well below the threshold for detectable change.

Forest health would be improved within the units as a result of treatments proposed under the action alternatives and treated stands would be more resilient to insects and disease in the future. Insect and disease mortality would continue unmitigated in untreated stands within the watershed. Wildfires would continue to occur, but in treated areas the intensity would be reduced due to the lesser amount of fuel that would be available. This is a proven fact when looking at the Mussigbrod Fire of 2000 and the Rat Creek Fire in 2008 that occurred in the northwest portion of the watershed.

4.3.5 Cumulative Effects of Alternative B

Current impacts resulting from grazing, timber harvest, recreation, and other activities on private and State lands, would continue. This could affect wildlife migration and dispersal depending on timber harvests planned on State and private lands in the future. Any reductions in AUMs on BLM lands would increase grazing use on private or state land within the watershed if herd numbers stay the same.

Generally, additional impacts or predicted effects other than those described in section 4.2.4 and 4.2.5 are not expected on a landscape level.

4.3.6 Cumulative Effects of Alternative C

Impacts resulting from grazing, timber harvest, recreation, and other activities on private and State lands, would continue. This could affect wildlife migration and dispersal depending on timber harvests planned on State, Forest Service or private lands in the future. Any reductions in AUMs on BLM lands would increase grazing use on private or state land within the watershed if herd numbers stay the same.

Impacts in addition to those described under section 4.2.4 and 4.2.5 are not expected.

5.0 CONSULTATION AND COORDINATION:

5.1 List of Preparers:

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Other BLM employees that assisted in the preparation of this document include:

Rick Waldrup, Outdoor Recreation Planner
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5.2 Consultation/Coordination:

5.2.1 Persons and Agencies Consulted:

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| Dave Smith | Big Hole Grazing Association |
| Max Lapham | Lapham Ranches |
| Jay Lyndes | JC Ranches |
| Ed Peterson | JC Ranches |
| Torrey Holland | Diltana Ranches |
| Joe Johnson | Johnson Brothers Inc. |
| Seth Stoddard | Landowner |
| Fred Hirschy | Grazing Lessee |
| Carl Lewis | Grazing Lessee |

A complete list of BLM lessees, state and federal agency personnel, and the interested public that were contacted or consulted is available at the BLM – Dillon Field Office.

5.2.2 Notifications:

Assessment Initiation Notification; Upper Big Hole Mailing List – June, 2009

Media Release; Assessment Initiation Notice – June, 2009

Internet NEPA Log – Dillon Field Office – December 2009

BLM Dillon Field Office Website – Assessment Report – December 2009

BLM Dillon Field Office Website – Executive Summary and Authorized Officer’s Determination – December 2009

Media Release; Assessment Completion and EA Initiation Notice – January, 2010

5.2.3 Statement of Public Interest:

Several individuals and groups have expressed interest in this proposed action. The mailing list of individuals and groups who have expressed interest to date is available at the Dillon Field Office.

GLOSSARY OF TERMS

actual use: a report of the actual livestock grazing use certified to be accurate by the permittee or lessee. Actual use may be expressed in terms of animal months or animal months.

allopatric: (of biological species or speciation) occurring in areas isolated geographically from one another

allotment: An area of land designated and managed for grazing livestock.

allotment management plan (AMP): a documented program which applies to livestock grazing on the public lands, prepared by consulting, cooperating, and coordinating with the permittee(s), lessee(s), or other interested publics.

analysis: (1) a detailed examination of anything complex in order to understand its nature or determine its essential features; or (2) a separating or breaking up of any whole into its component parts for the purpose of examining their nature, function, relationship, etc. A rangeland analysis includes an examination of both biotic (plants, animals, etc.) and abiotic (soils, topography, etc.) attributes of the rangeland.

animal unit month(AUM): the amount of dry forage required by one animal unit for one month, based on a forage allowance of 26 pounds per day.

apparent trend: an assessment, using professional judgment, based on a one-time observation. It includes consideration of such factors as plant vigor, abundance of seedlings and young plants, accumulation or lack of plant residues on the soil surface, and soil surface characteristics (i.e., crusting, gravel pavement, and sheet or rill erosion).

biomass: all vegetative materials grown in forest, woodland, or rangeland environments that are the by-products of management, restoration, or fuel reduction treatments (historically non-utilized or under-utilized material). This term usually refers to such material that can be gathered and transported to cogeneration plants, and utilized for the production of energy.

browse: (1) the part of shrubs, half shrubs, woody vines, and trees available for animal consumption; or (2) to search for or consume browse.

browse plant or browse species: a shrub, half shrub, woody vine, or tree capable of producing shoot, twig, and leaf growth suitable for animal consumption.

canopy cover: the percentage of ground covered by a vertical projection of the outermost perimeter of the natural spread of foliage of plants. Small openings within the canopy are included. Canopy cover is synonymous with crown cover.

community: an assemblage of populations and/or animals in a common spatial arrangement.

cool season species: plants whose major growth occurs during the late fall, winter and early spring.

evaluation: (1) an examination and judgment concerning the worth, quality, significance, amount, degree, or condition of something; or (2) the systematic process for determining the effectiveness of on-the-ground management actions and assessing progress toward meeting objectives.

forage: (1) browse and herbage which is available and can provide food for animals or be harvested for feeding; or (2) to search for or consume forage.

forb: (1) any herbaceous plant other than those in the Gramineae (true grasses), Cyperaceae (sedges), and Juncaceae (rushes) families—i.e., any non-grass-like plant having little or no woody material on it; or (2) a broadleaved flowering plant whose above ground stem does not become woody and persistent.

functional at risk (FAR): Riparian wetland areas that are functional, but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

goal: the desired state or condition that a resource management policy or program is designed to achieve. A goal is usually not quantifiable and may not have a specific date by which it is to be completed. Goals are the base from which objectives are developed. (See objective)

grazing system: A systematic sequence of use and non use of an allotment.

herbaceous: vegetation growth with little or no woody component; non-woody vegetation such as graminoids and forbs.

hot season: In southwest Montana, hot season grazing use is generally considered to include July 1 through September 15.

hummock: A mound rising above the surrounding land, usually overgrown with vegetation. In the southeast, a small hill or mound, also referred to as hammock. Often used in reference to marsh lands.

hydrologic heaving: The lifting of a surface by the internal action of frost or hydrostatic pressure. The result is the hummocked appearance of plants being elevated above the normal ground surface, rootshearing between plants, and exposure of interspaces to increased erosional forces.

interested public: An individual, group or organization that has submitted a written request to the authorizing officer to be provided an opportunity to be involved in the decision making process for the management of livestock grazing on specific grazing

allotments, or has submitted written comments to the authorized officer regarding the management of livestock grazing on a specific allotment.

interpretation: explaining or telling the meaning of something and presenting it in understandable terms.

inventory: the systematic acquisition and analysis of information needed to describe, characterize, or quantify resources for land-use planning and management or the public lands.

key area: “Key areas are indicator areas that are able to reflect what is happening on a larger area as a result of on-the-ground management actions. A key area should be a representative sample of a larger stratum, such as a pasture, grazing allotment, wildlife habitat area, herd management area, etc., depending on the management objectives being addressed by the study....”

line officer: The manager of a defined portion of public land. For example, the Dillon Field Manager is the Authorized Officer or line manager for the public lands administered by the Dillon Field Office.

monitoring: the orderly collection, analysis, and interpretation of resource data to evaluate progress toward meeting objectives.

objective: planned results to be achieved within a stated time period. Objectives are subordinate to goals, are narrower in scope and shorter in range, and have increased possibility of attainment. The time periods for completion, and the outputs or achievements that are measurable and quantifiable, are specified. (See goal)

pasture: a grazing area enclosed and separated from other areas by a fence or natural barrier.

proper functioning condition (PFC): A riparian-wetland area is considered to be in proper functioning condition when adequate vegetation, landform, or large woody debris is present to:

- Dissipate stream energy associated with high waterflow, thereby reducing erosion and improving water quality;
- Filter sediment, capture bedload, and aid floodplain development;
- Improve flood-water retention and ground-water recharge;
- Develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses;
- Support greater biodiversity

public lands: any land interest in land outside of Alaska owned by the United States and administered by the Secretary of the Interior through the Bureau of Land Management (see 43 CFR 41000.0-5)

riparian zone: the banks and adjacent areas of water bodies, water courses, seeps, and springs whose waters provide soil moisture sufficiently in excess of that otherwise available locally so as to provide a moister habitat than that of contiguous flood plains and uplands.

seral stage: the developmental stages of an ecological succession; synonymous with successional stage.

shrub: a plant that has persistent woody stems and a relatively low growth habit, and that generally produces several basal shoots instead of a single bole. It differs from a tree by its low stature—less than 5 meters (16 feet)—and non-arborescent form.

shrubland: land on which the vegetation is dominated by shrubs. Non-forested lands are classified as shrubland if shrubs provide more than 20 percent of the canopy cover, excluding trees. Lands not presently shrubland that were originally or could become shrubland through natural succession may be classified as potential natural shrubland.

succession: the orderly process of community change; it is the sequence of communities that replace one another in a given area.

trend: the direction of change in ecological status or in resource value ratings observed over time. Trend in ecological status is described as “toward” or “away from” the potential natural community or as “not apparent.” Appropriate terms are used to describe trends in resource value ratings. Trends in resource value ratings for several uses on the same site at a given time may be in different directions, and there is no necessary correlation between trends in resource value ratings and the trend in ecological status.

understory: plants growing beneath the canopy of other plants; usually refers to grasses, forbs, and low shrubs under a tree or shrub canopy.

use guideline: (1) a degree of utilization of current year’s growth which , if continued, will achieve objectives and maintain or improve the long-term productivity of the site; or (2) the percentage of a plant that is utilized when the rangeland as a whole is properly utilized. This use level can vary with time and systems of grazing.

utilization: the proportion or degree of the current year’s forage production by weight that is consumed or destroyed by animals (including insects). The term may refer either to a single plant species, a group of species, or the vegetation community as a whole. Utilization is synonymous with use.

vigor: relates to the relative robustness of a plant in comparison to other individuals of the same species. It is reflected primarily by the size of a plant and its parts in relation to its age and the environment in which it is growing.

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