



Madison Watershed Environmental Assessment

DOI-BLM-MT-B050-2009-0060-EA

Dillon Field Office

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Table of Contents

List of Tables	ii
List of Figures	ii
1.0 Purpose of and Need for the Proposed Action	1
1.1 Introduction and Background	1
1.2 Proposed Action, Purpose and Need.....	1
1.3 Issues.....	5
1.4 Scope of this Environmental Analysis – Scope, Plan Conformance, Critical Elements, and Issues	10
1.5 Decisions to be Made.....	12
1.6 Applicable Legal and Regulatory Requirements	12
1.7 Coordination Requirements	13
2.0 Description of Alternatives	14
2.1 Process Used to Formulate Alternatives	14
2.2 Alternatives Considered but Eliminated from Further Analysis.....	14
2.3 Description of Alternatives	15
2.3.1 Features Common to All Alternatives, Including the No Action.....	15
2.3.2 Description of Alternative A - No Action	18
2.3.3 Features Common to All Action Alternatives	21
2.3.4 Description of Alternative B	26
2.3.5 Description of Alternative C	37
2.4 Summary Comparison of Alternative Actions.....	45
3.0 Affected Environment	54
3.1 General Setting.....	54
3.2 Description of Affected Issues, Resource Concerns and Critical Elements	54
4.0 Environmental Consequences	69
4.1 Introduction.....	69
4.2 Predicted Effects of Alternatives	69
4.2.1 Predicted Effects Common to All Alternatives, Including the No Action.....	69
4.2.2 Predicted Effects of Alternative A-No Action	73
4.2.3 Predicted Effects Common to All Action Alternatives	78
4.2.4 Predicted Effects of Action Alternatives B and C by Grazing Allotment.....	85
4.3 Cumulative Effects for All Alternatives	107
5.0 List of Preparers - Consultation/Coordination	114
5.1 List of Preparers	114
5.2 Consultation/Coordination	114
5.3 Glossary of Terms.....	115
5.4 References.....	119

Appendices

Appendix A – Maps; 1-15

Appendix B – East Bench Watershed Monitoring Plan

Appendix C - Sensitive Plant Species and Wildlife Species Biological Evaluations

List of Tables

<u>Table</u>	<u>Page</u>
1.1 Determination of Standards by Allotment	2
1.2 Critical Elements of the Human Environment.....	11
2.1 Grazing Allotments Summary	19
2.2 Proposed Authorized Use for Aspen Creek allotment, Alternative B	27
2.3 Proposed Authorized Use for Horse Creek allotment, Alternative B.....	27
2.4 Proposed Authorized Use for Axolotl allotment, Alternative B or C.....	28
2.5 Proposed Authorized Use for Bar Seven allotment, Alternative B	28
2.6 Proposed Authorized Use for Elmer allotment, Alternative B	28
2.7 Proposed Authorized Use for Ledyard-McGuinness allotment, Alternatives B or C.....	29
2.8 Proposed Authorized Use for McAtee Bridge allotment, Alternative B	29
2.9 Proposed Authorized Use for North Morgan allotment, Alternative B	30
2.10 Proposed Authorized Use for Preacher Creek AMP allotment, Alternative B.....	30
2.11 Proposed Authorized Use for Revenue Common AMP allotment, Alternative B	31
2.12 Proposed Authorized Use for Shirley allotment, Alternative B	32
2.13 Proposed Authorized Use for Sitz allotment, Alternative B.....	32
2.14 Proposed Authorized Use for Strawberry Ridge allotment, Alternative B or C.....	33
2.15 Proposed Authorized Use for Trail Creek C&H AMP allotment, Alternative B or C	33
2.16 Proposed Authorized Use for Wallace Peak AMP allotment, Alternative B	34
2.17 Proposed Authorized Use for Windy Pass allotment, Alternative B	35
2.18 Forest and Woodland Treatment Units, Alternative B	36
2.19 Proposed Authorized Use for Aspen Creek allotment, Alternative C	38
2.20 Proposed Authorized Use for Bar Seven allotment, Alternative C	38
2.21 Proposed Authorized Use for McAtee Bridge allotment, Alternative C	39
2.22 Proposed Authorized Use for MVHP allotment, Alternative C	39
2.23 Proposed Authorized Use for North Morgan allotment, Alternative C	39
2.24 Proposed Authorized Use for Preacher Creek AMP allotment, Alternative C	40
2.25 Proposed Authorized Use for Revenue Commons AMP allotment, Alternative C.....	40
2.26 Proposed Authorized Use for Sitz allotment, Alternative C	41
2.27 Proposed Authorized Use for Wallace Peak AMP allotment, Alternative C	42
2.28 Proposed Authorized Use for Windy Pass allotment, Alternative C	42
2.29 Forest and Woodland Treatments Units, Alternative C.....	42
2.30 Comparison of Proposed Livestock Grazing or Administrative Alternatives	45
2.31 Comparison of Forest and Woodland Treatments by Alternative	52
2.32 Comparison of Travel Management Actions by Alternative.....	53
2.33 Comparison of Noxious and Invasive Species Treatments by Alternative.....	53
4.1 Summary of Proposed Projects on All Grazing Allotments by Alternative	84

List of Figures

3.1 The Percentage of the Total Stream Miles in Each Functional Class	55
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Chapter 1

1.0 Purpose of and Need for the Proposed Action

1.1 Introduction and Background

The Madison Watershed (MW) is located in Madison County, Montana. The MW drains portions of the Madison, Tobacco Root and Gravelly mountain ranges and lies within Townships 2-12 South and Ranges 3 West through 1 East, Montana Principal Meridian (Map 1, Appendix A). The MW covers approximately 947,000 total acres land, of which approximately 39,000 acres (4%) is public land administered by the Bureau of Land Management (BLM). The BLM administered land is interspersed and managed with private, state and United States Forest Service (USFS) land. Thirty nine grazing allotments contain about 30,700 acres of public land, including 1,874 allotted acres within the Bear Trap Wilderness Area. The Bear Trap Wilderness Area also contains 4,473 un-allotted acres. An additional 2,616 acres of un-allotted or un-leased public tracts are scattered throughout the watershed.

The MW follows grazing allotment boundaries and includes some allotments that are only partially within the watershed. Watersheds are defined by natural topographical boundaries (ridgelines/drainages). Grazing allotment boundaries are determined by previous BLM decisions based primarily on land ownership and may not follow topographical features. Therefore, some of the grazing allotments fall within one or more watersheds or hydrologic units.

In 2009, an interdisciplinary team (IDT) assessed BLM administered land in the MW for the five Standards of Rangeland Health. The Standards are: Upland Health, Riparian Health, Water Quality, Air Quality, and providing for Biodiversity. The MW Assessment Report described the condition/function of resources within the assessment area to the Authorized Officer. The MW Assessment Report and the Authorized Officer's Summary and Determination have been made available to the public and 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.

The condition/function and recommendations in the MW Assessment Report, along with comments received through public scoping, have been used to develop management alternatives (Chapter 2). The alternatives are designed to initiate progress towards Proper Functioning Condition (PFC) and address site specific resource concerns. This Environmental Assessment (EA) was completed in accordance with established procedures to analyze and implement allotment, landscape or site specific changes.

Resource management on a watershed basis facilitates decisions and projects on a landscape scale. It is the BLM's intent to implement management cooperatively, and all proposed changes will be initiated through the BLM's decision process.

1.2 Proposed Action, Purpose and Need

The BLM Dillon Field Office proposes to improve land health and enhance biodiversity by:

- Restoring and/or maintaining riparian, wetland and aquatic habitats through revised livestock grazing management, construction of rangeland projects, and/or implementing vegetative treatments.
- Restoring and/or maintaining upland grassland habitats through revised grazing management, construction of rangeland projects, and/or implementing vegetative treatments.
- Restoring and/or maintaining historic density, structure, and species composition of forest and woodland habitats through mechanical and chemical treatments, commercial timber harvest and/or prescribed fire.
- Maintaining and/or enhancing sagebrush steppe habitat (species composition and structure).
- Eradicating new and containing existing noxious weed and invasive species infestations.
- Mitigating resource impacts from recreational activities while providing access to public lands through modifications to motorized travel route designations.

In addition, the BLM proposes to renew term grazing leases within the MW, initiate treatments to salvage harvest dead and dying timber and reduce fuel loading in the Wildland Urban Interface (WUI). As a result of resource conditions documented in the MW Assessment Report, management alternatives will be analyzed that may modify the mandatory terms and conditions of some grazing permits. In addition, as the result of this process the BLM may combine, divide, or eliminate grazing allotments.

This EA is in direct response to land health condition/function and recommendations identified in the MW Assessment Report. In that document, the IDT described several causal factors, which, when combined, negatively impact the biological, physical, and ecological processes in the MW. As a result, the Authorized Officer determined that one or more of the Standards are not met in 14 of the 39 grazing allotments.

The Fundamentals of Rangeland Health and 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...,” if an assessment determines one or more of the Land Health Standards are not being met (43 CFR 4180.1(a)).

Table 1.1 shows the Authorized Officer’s determination of each standard in each grazing allotment in the MW.

Table 1.1: Determination of Standards by Allotment

Allotment, Number, Category*	Are Land Health Standards Met?				
	Uplands	Riparian	Water Quality	Air Quality	Biodiversity
Aspen Creek #10540 (I)	Yes	No	1	Yes	Yes
Axolotl #20485 (I)	Yes	Yes	1	Yes	No

Allotment, Number, Category*	Are Land Health Standards Met?				
	Uplands	Riparian	Water Quality	Air Quality	Biodiversity
Bar Seven #10457 (C)	No	N/A	Yes ^{1,2}	Yes	No
Billie Mine Isolated #20430 (C)	Yes	Yes	N/A	Yes	Yes
Carter #20386 (C)	Yes	N/A	N/A	Yes	Yes
Cliff Lake #10437 (C)	Yes	N/A	N/A	Yes	Yes
Corral Creek #10543 (C)	Yes	Yes	1	Yes	Yes
Dehaan #20390 (C)	Yes	N/A	N/A	Yes	Yes
Easter #20393 (C)	Yes	Yes	No ^{1,2}	Yes	Yes
Elmer #20394 (C)	Yes	No	1	Yes	Yes
Flying D #20420 (C)	Yes	N/A	N/A	Yes	No
Glen Kyle #20412 (C)	Yes	Yes	1	Yes	Yes
Jourdain #20410 (C)	Yes	Yes	1	Yes	Yes
Kelly Meridian #10539 (C)	Yes	N/A	N/A	Yes	Yes
Ledyard- McGuinness #20416 (C)	Yes	N/A	N/A	Yes	Yes
Maltby's Mound #30402 (C)	Yes	N/A	N/A	Yes	Yes
McAtee Bridge #10529 (I)	No	Yes	Yes ¹	Yes	No
Michel #20417 (C)	No	No	1	Yes	Yes
Mill Creek-Gustin #10465 (C)	Yes	Yes	Yes ²	Yes	Yes
MVHPA #10550 (I)	Yes	Yes	Yes ²	Yes	Yes
North Indian Creek #10140 (C)	Yes	Yes	N/A	Yes	Yes
North Meadow Creek #10380 (C)	Yes	Yes	N/A	Yes	Yes
North Morgan #20423 (C)	No	Yes	Yes ²	Yes	No
Parent Isolated #20406 (C)	Yes	N/A	N/A	Yes	Yes

Allotment, Number, Category*	Are Land Health Standards Met?				
	Uplands	Riparian	Water Quality	Air Quality	Biodiversity
Pony Gulch Isolated #20405 (C)	Yes	Yes	1	Yes	Yes
Preacher Creek #20404 (M)	Yes	No	1	Yes	Yes
Red Bluff #00982 (C)	Yes	Yes	1	Yes	Yes
Revenue Common AMP #20407 (I)	Yes	No	1	Yes	Yes
Shirley #10436 (C)	No	Yes	1	Yes	No
Sitz #00438 (C)	No	Yes	1	Yes	No
Strawberry Ridge #10421 (I)	Yes	Yes	1	Yes	Yes
Sun Ranch Isolated #20460 (C)	Yes	Yes	1	Yes	Yes
Trail Creek C&H AMP #30401 (M)	Yes	Yes	No ^{1,2}	Yes	Yes
Trout Creek #20496 (C)	Yes	Yes	1	Yes	Yes
Wall Creek AMP #10522 (C)	Yes	Yes	Yes ²	Yes	Yes
Wall Creek Game Range #00819 (C)	Yes	Yes	Yes ^{1,2}	Yes	Yes
Wallace Peak AMP #10447 (M)	Yes	No	1	Yes	Yes
Willow Creek #10440 (C)	Yes	Yes	1	Yes	Yes
Windy Pass AMP #20385 (M)	Yes	No	1	Yes	No
<p>* Categories are assigned to allotments based on resource management goals: I=improve, M=maintain, C=custodial</p> <p>¹ The Montana Department of Environmental Quality (DEQ) has been given the responsibility for making water quality determinations and has completed its evaluation of 303(d)-listed streams. Tributary streams in the MW are not on the 303(d) list, are not priority streams, and are not scheduled to be evaluated by the DEQ.</p> <p>² Middle Madison and Lower Madison River, as well as Ennis Lake border or flow through BLM administered land, have been evaluated by DEQ and beneficial use support determinations have been completed. Middle Madison Supports all Beneficial Uses. Ennis Lake and Lower Madison do not meet at least one Beneficial Use and a TMDL is required.</p>					

The Authorized Officer determined that livestock grazing impacts are contributing to one or more of the Standards not being met in 11 grazing allotments. Pursuant to 43 CFR 4180.2(c), livestock-caused failure to meet any of the Standards mandates the BLM to change the terms and conditions of the grazing permit/lease for the applicable grazing allotment prior to the next grazing season and implement actions that will result in significant progress toward fulfillment

of the Standards. Further, BLM guidance stipulates that if other actions are necessary and cannot be implemented before the next grazing season interim adjustments will be made prior to the next grazing season and a schedule for final changes must be developed and documented (H-4180-1). Allotments requiring livestock management changes to address specific resource problems are: Aspen Creek, Bar Seven, Elmer, McAtee Bridge, North Morgan, Preacher Creek, Revenue Commons AMP, Sitz, Wallace Peak AMP and Windy Pass AMP.

1.3 Issues

Description of Issues, Resource Concerns and Objectives

Issues and resource concerns were identified during the MW Assessment and the public scoping process. Issues, as described below, have a direct bearing upon the proposed action and the process of how the purpose and need will be achieved. The identified issues are used to drive development of alternatives, and effects to these issues are analyzed in detail. Resource concerns do not necessarily drive the development of alternatives, but are addressed by proposed actions in the alternatives.

A range of management alternatives to address these resource issues and concerns are described in Chapter 2. The predicted effects of the various alternatives and their anticipated effectiveness in meeting objectives are analyzed in Chapter 4.

Four primary land health issues and six additional resource concerns are listed below. A brief description or explanation and management objectives for each issue and resource concern are included. Progress toward meeting some objectives can be quantifiably measured, e.g. acres of prescribed burns completed. Others, like reducing stream bank impacts and sediment input into streams, are evaluated over time by long term trend indicators such as relative changes in riparian vegetation composition and abundance and/or channel width/depth ratio.

Additional information about methodologies and documented resource concerns can be found in the MW Assessment Report which is available at the Dillon Field Office or on the internet at http://www.blm.gov/mt/st/en/fo/dillon_field_office.html.

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

One of the Western Montana Standards for Rangeland Health is “Riparian and Wetland Areas are in Proper Functioning Condition (PFC).” PFC is defined as the ability of a stream or wetland to perform its riparian functions. These functions include sediment filtering, bank building, water storage, aquifer recharge and hydrologic energy dissipation. Streams or wetlands that are categorized as Functional-At-Risk (FAR) with an upward trend also meet the riparian health standard. The methods and procedures used to determine riparian health in the Madison Watershed are discussed in the MW Assessment Report.

The riparian health standard was not met in seven grazing allotments. The MW Assessment Report documents several resource concerns including alteration of stream morphology (channel shape and gradient) with resultant over-widening, reduced access to floodplains, and/or channel entrenchment. Impacts to vegetation included limited species recruitment and regeneration,

reduced structural diversity and/or decreased vigor of streamside vegetation. Increasing juniper cover is adversely affecting deciduous riparian habitat on two stream reaches in the MW.

These conditions were attributable to several factors including livestock grazing, conifer expansion, historic mining, wildlife browsing, sedimentation from roads, and off-road vehicle use in localized areas.

Objectives:

- Restore stream dimension, pattern and profile to the natural range of variation where concerns were documented.
- Restore deciduous woody and herbaceous riparian habitat types, with emphasis on reducing juniper and non-native species composition.
- Increase deep-rooted riparian vegetation (sedges, willows) where decreased composition was documented.
- Reduce sediment inputs into streams where human activities such as authorized grazing, recreational impacts and roads are contributing to un-naturally high sediment loads.
- Maintain/enhance habitat for cold water fisheries in occupied streams within the watershed.
- Restore, maintain and/or enhance native vegetation and hydrology of springs, seeps and wet meadows with emphasis on ecological function and biodiversity.
- Protect developed springs (spring sources) from impacts by ungulates.

Issue #2: Upland Habitat and Associated Species

“Uplands are in PFC” is identified as one of the Western Montana Standards for Rangeland Health. The determination of upland health was based on the evaluation of three criteria: degree of soil stability and watershed function, nutrient cycles and energy flows, and available recovery mechanisms. The indicators used to determine upland health are discussed in the MW Assessment Report.

The uplands in 33 grazing allotments, the Bear Trap Wilderness and all the un-allotted or un-leased land in the MW, comprising about 92% of the BLM public land in the watershed, are functioning properly under existing management. The upland health in five allotments was determined to be FAR with a static or downward trend. One relatively small area (<5 acres) of one allotment was determined to be non-functional (NF) due to the construction of livestock management facilities on public land administered by the BLM.

Resource concerns include a shift in the dominant herbaceous vegetation communities from cool season bunchgrasses to less productive warm season grasses, annual invasive species and/or unpalatable vegetation, increased bare ground, and cheatgrass and noxious weed infestations. Sagebrush habitat in the MW is in good condition and doesn't present a resource issue. However, the BLM recognizes this as valuable habitat and will continue to monitor sagebrush habitat health and perpetuate or improve the current condition.

Objectives:

- Restore the soil/site stability, hydrological function, and biotic integrity of upland sites in allotments where one or more of these attributes of rangeland health was determined to be reduced.
- Increase cover and frequency of native perennial cool season herbaceous species where concerns were documented, which will improve the hydrological function and site productivity.
- Reduce bare ground and interspaces between plants to reduce potential wind and/or water erosion.
- Restore/maintain open sagebrush communities in habitats with conifer expansion.
- Maintain existing sagebrush habitat so that 75% or more of big sagebrush communities provide vegetative composition and structure for sagebrush obligate species.

Issue #3: Forest and Woodland Habitat

Forests and woodlands provide habitat for a large variety of species, including many special status species. As a result of historic timber harvest and exclusion of fire, forest and woodland habitats have been altered from the historic range of variation. Conifer densities have increased within forested stands, particularly within Douglas-fir forest types, and there has been a loss of mountain meadows and aspen due to conifer expansion. The majority of forested stands, in all habitat types, are in late-seral stages and are experiencing mortality from insects and disease, or are highly susceptible to insect outbreaks. Epidemic mountain pine beetle has resulted in extensive mortality of lodgepole pine. Whitebark pine is rapidly declining throughout its range, and all whitebark pine habitats in the MW are at high risk of loss due to extensive mortality and lack of disturbance to stimulate regeneration.

The condition of forest and woodland habitats were determined to be a causal factor in **not** meeting the Biodiversity Standard on two allotments, primarily due to declining whitebark pine habitats. Additional site-specific concerns included epidemic insect and disease activity, departure from the historic range of variation for forest density and structure, and aspen decline.

Objectives:

- Maintain/enhance existing aspen and whitebark pine stands and promote successful regeneration of aspen and whitebark pine.
- Increase diversity of seral stages and structures in forested habitats.
- Reduce hazard rating for spruce budworm and/or Douglas-fir beetle activity.
- Where possible, salvage dead/dying forest stands from epidemic insect activity.
- Utilize forest products where feasible.

Issue #4: Noxious and Invasive Species

Large scale infestations of noxious weeds were determined to be the primary causal factor for two allotments (Flying D and Shirley) in the MW **not** meeting one or more of the Standards for Land Health.

Aquatic invasive species such as Eurasian water milfoil, though not present within the watershed, pose a threat to the MW due to the high use of the area by recreationists.

Cheatgrass, though not a noxious weed, is a resource issue because it occurs in various sized patches throughout the lower elevations in the watershed. Cheatgrass is an extremely competitive early cool season (winter annual) species that flourishes in disturbed sites and has the potential to shorten the fire return interval, especially in sagebrush steppe habitat, because it becomes a fine flashy fuel as it cures in early summer.

Objectives:

- Contain, control and/or eradicate existing infestations of noxious weeds using Integrated Weed Management methods.
- Prevent new infestations of noxious weeds from getting established.
- Obtain and maintain an inventory of weed locations within the area to help develop priority control objectives and methods.
- Educate river users in the methods to stop the spread of invasive species (e.g. whirling disease, New Zealand mud snails, Eurasian water milfoil) either into the Madison River or from the Madison River to another body of water.
- Prevent or minimize the spread of cheatgrass.

Resource Concern #1: Special Status Species

Special Status Species (SSS) include federally listed Threatened, Endangered, Proposed and Candidate Species, and BLM Sensitive Species. See the Biological Evaluations (BE) on Threatened and Endangered (T&E) species, Special Status plants, wildlife, and fish in Appendix C for additional information. Special Status Species are discussed in the MW Assessment Report, as well as chapters 3 and 4 of this EA.

Objective:

- Provide habitat to maintain viable and diverse populations of native plant and animal species, including special status species.

Resource Concern #2: Wilderness Characteristics

The MW includes the Bear Trap Canyon Unit of the Lee Metcalf Wilderness – the only designated wilderness on BLM administered lands in Montana. The watershed also includes the Axolotl Lakes Wilderness Study Area (WSA).

Objectives:

- Maintain or improve the wilderness characteristics in the Axolotl Lakes WSA that were present at the time of the wilderness inventory (1979-80).
- Manage the Bear Trap Canyon unit of the Lee Metcalf Wilderness to provide for the long term protection and preservation of the area's wilderness character.
- Reduce unauthorized livestock use in the Bear Trap Canyon Wilderness to reduce the impacts of livestock use.

Resource Concern #3: Recreation and Travel Management

There are approximately 70 miles of designated motorized vehicle routes on public land within the MW providing access to some of Montana's most popular recreation destinations. River access locations and campgrounds along the river are heavily used during the summer months. During the fall and winter, BLM lands are heavily used for hunting and/or provide important

access to hunting on USFS and state lands beyond. Winter recreation also includes backcountry skiing, snowshoeing, and snowmobiling.

Objectives:

- Implement the Dillon Resource Management Plan (RMP) Travel Management Plan.
- Maintain motorized wheeled vehicle access to those areas where it already exists, and improve access to public lands where opportunities are currently limited. Revise motorized route designations as necessary to correct mapping errors and improve route designations.
- Reduce unauthorized (non-designated route travel) motor vehicle use which occurs most frequently during the hunting season.
- Reduce resource impacts caused by recreationists, including spread of noxious weeds and aquatic invasive species.

Resource Concern #4: Socioeconomics

Many ranches that hold BLM grazing leases/permits have developed operations dependant on a combination of public land grazing preferences and private land resources.

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

Non-commercial hunting and fishing opportunities on BLM administered public lands in the MW provide an important economic contribution to the local economies of Ennis, Cameron, Norris, Harrison, Pony, and Virginia City. Also, the BLM currently authorizes over 180 commercial recreational operators to utilize public land in the watershed.

Objectives:

- 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 activities.
- Recover economic value of dead/dying timber before it is lost due to decay, where feasible.

Resource Concern #5: Wildland Urban Interface

The wildland urban interface (WUI) is defined in the Dillon RMP as the line, area or zone where structures and other human developments meet or intermingle with undeveloped wildland or vegetative fuels. Live and dead fuels pose a wildfire threat to scattered permanent homes and seasonally-used dwellings in the MW.

Objectives:

- Reduce fuel loading and continuity to modify potential wildfire behavior and provide greater opportunity for management actions.
- Coordinate with private landowners and other affected agencies to maximize effectiveness of fuel reduction treatments.

Resource Concern #6: Cultural Resources

A detailed summary and description of the cultural resources occurring on each allotment in the MW is on file in the Dillon Field Office

Objectives:

- Preserve and protect significant cultural resources and ensure that they are available for appropriate uses by present and future generations.
- Reduce imminent threats from natural or human-caused deterioration, or potential conflict with other resource uses.
- Ensure that all authorizations for land and resource use avoid inadvertent damage to federal and nonfederal cultural resource in compliance with Section 106 of the National Historic Preservation Act.

1.4 Scope of this Environmental Analysis – Scope, Plan Conformance, Critical Elements

1.4.1 Scope

The scope of the proposed action includes authorizing livestock grazing, implementing commercial and non-commercial vegetation treatments, prescribed burning, and minor changes in travel management within the MW. Proposed vegetation treatments are designed to restore specific habitat types on public lands. The proposed action may also include installation, construction, removal or modification of fences, water developments, road construction, and stream crossings.

The proposed action addresses several program areas that affect land health. It is not an all-inclusive management plan or a programmatic EA.

1.4.2 Conformance with BLM Land Use Plans, Programs, and Policies

This document is tiered to the Dillon RMP, approved in 2006, and the management alternatives considered are in conformance with the RMP. Applicable guidance is in the Record of Decision (ROD) and Approved Dillon RMP, which may be accessed on the internet at <http://www.mt.blm.gov/dfo/rmp/index.html>.

The ROD identified goals, objectives, land use allocations, and management actions for each program area on public lands managed by the BLM Dillon Field Office. All alternatives in this EA, except the No Action Alternative, propose treatments in support of these identified actions, allocations, and objectives.

The proposed actions are 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), the Interim Management Policy for Lands Under Wilderness Review (BLM Handbook H-8550-1), Wilderness Management Plan for Bear Trap Canyon Unit of Lee Metcalf Wilderness, BLM policies and Federal regulations.

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 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, and the Management Plan, Conservation strategies for Sage Grouse in Montana, and the 2010 Nonpoint Source Memorandum of Understanding were also considered during alternative development.

1.4.3 Critical Elements of the Human Environment

Critical Elements of the Human Environment, as defined by BLM Manual 1790-1, must be considered in all BLM EAs and Environmental Impact Statements (EISs). The scoping process indicated which Critical Elements may be affected by the alternatives.

Table 1.2: Critical Elements of the Human Environment

Critical Element	Not present	Present, but not affected	May be affected*	Comments
Air Quality			X	Burning of slash materials may result in short term air quality deterioration. Prescribed burning is done in accordance with the MT/Dakotas Fire Management Plan and is coordinated with MT DEQ and the MT/ID Airshed Group. 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.
Areas of Critical Environmental Concern (ACEC)		X		The Blue Lakes ACEC, within the Axolotl Lakes WSA, will not be affected by management alternatives.
Cultural Resources		X		See features common to all alternatives in section 2.3.1, and a broader discussion of Cultural Resources in section 3.2.10.
Environmental Justice		X		No low income or minority groups would be disproportionately affected.
Farmland (prime or unique)	X			
Floodplains ¹			X	Discussed under Issue # 1 – Riparian, Wetland and Aquatic Habitat and Associated Species.
Hazardous and Solid Wastes	X			
Invasive Non-native Species			X	Discussed under Issue # 4 - Noxious and Invasive Species.
Native American Religious Concerns	X			Tribes familiar with the area have expressed no religious concerns.
T&E species			X	See BE for T&E and Sensitive Species in Appendix C, or in EA file MT-B050-2009-0060-EA at the Dillon Field Office.
Water Quality (drinking or ground)			X	Discussed under Issue # 1 – Riparian, Wetland and Aquatic Habitat and Associated Species.
Wetlands/Riparian Zones			X	Discussed under Issue # 1 – Riparian, Wetland and Aquatic Habitat and Associated Species.
Wild and Scenic Rivers	X			

Critical Element	Not present	Present, but not affected	May be affected*	Comments
Wilderness Characteristics			X	Discussed under Resource Concern #2 – Wilderness Characteristics
<p>* An “X” in this box means that the resource is further evaluated in the affected environment and environmental impacts sections.</p> <p>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.</p>				

1.5 Decisions to be Made

The BLM is preparing this EA to allow the Authorized Officer to make a reasoned and informed decision regarding improving riparian habitat, improving upland habitat, maintaining/enhancing sagebrush steppe habitat, improving forest and woodland conditions, enhancing biodiversity, adjusting motorized route designations, and revising or renewing term grazing leases. Revised grazing leases would contain appropriate terms and conditions to initiate significant and measurable progress towards achieving the Standards and established goals and objectives within the MW.

The Dillon Field Manager will choose the alternative that best addresses resource concerns identified by the BLM and issues identified through scoping, and allows for multiple use.

The Dillon Field Manager must also determine if a selected alternative is a major Federal Action that significantly affects the quality of the human environment. If he determines that it is, then an EIS must be prepared before the MW management plan can proceed.

Implementation of the Decisions issued as a result of this EA will begin in 2010, but full implementation may take several years and is subject to budget constraints. The decisions will be implemented in consultation and coordination with the affected permittees, the agencies having lands or managing resources within the area, and other interested parties. As with all similar BLM decisions, affected parties will have an opportunity to protest and/or appeal these decisions.

1.6 Applicable Legal and Regulatory Requirements

- Title 43, Code of Federal Regulation, Part 4100
- Taylor Grazing Act of June 30, 1934, as amended
- Sikes Act of 1960, as amended (Habitat improvement on Public Land)
- Lee Metcalf Wilderness and Management Act of 1983
- National Historic Preservation Act of 1966, as amended
- Carlson-Foley Act of 1968 (Weed Control on Public Lands)
- National Environmental Policy Act of 1969 (NEPA)
- Endangered Species Act of 1973
- Federal Noxious Weed Act of 1974, as amended in 1988, 1994
- Federal Land Policy and Management Act of 1976 (FLPMA)
- Fishery Conservation and Management Act of 1976
- Clean Water Act of 1977

- Public Rangelands Improvement Act of October 25, 1978
- Fish and Wildlife Improvement Act of 1978
- State of Montana Streamside Management Zone Law of July 1991
- National Fire Plan of 2000
- Healthy Forests Initiative of 2002
- Healthy Forests Restoration Act of 2003
- Dillon Resource Management Plan of 2006

1.7 Coordination Requirements

According to 43 CFR subparts 4110, 4120, 4130 and 4160, coordination requirements include affected permittees or lessees, the interested public, the State having lands or responsible for managing resources within the area, other Federal or State resource management agencies, and the Resource Advisory Council.

“Interested public” means an individual, group or organization that has submitted a written request to the Authorized 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.

Following the MW Assessment Report and Determination of Standards, BLM met with other federal agencies, state agencies, lessees and the interested public while developing this EA. A full list of persons and agencies consulted is in Chapter 5.

Chapter 2

2.0 Description of Alternatives

This chapter describes the alternative development process, alternatives considered but eliminated from further analysis, and alternatives carried forward and fully analyzed. As many as three management alternatives will be fully analyzed: the No Action Alternative (continuation of current management) and up to two action alternatives. Alternatives may apply to individual allotments (e.g., grazing management changes), or across a broader landscape (e.g., noxious and invasive species mitigation). Based on identified issues, combinations of allowable use levels, grazing systems, stocking rates, vegetative treatments and program specific projects, were discussed at length and carefully considered during scoping and the formulation of the management alternatives by the IDT.

2.1 Process Used to Formulate Alternatives

The development of management alternatives for the Watershed was guided by provisions of FLPMA and NEPA, as well as planning criteria listed in Chapter 1, and public input received during scoping. Other laws, as well as BLM planning regulations and policy, also directed alternative considerations and focused the alternatives on appropriate watershed-level decisions. Chapter 1 discusses the issues and resource concerns considered during the alternative development. The Affected Environment (Chapter 3) discusses existing resource conditions related to the issues and resource concerns identified in Chapter 1.

2.2 Alternatives Considered but Eliminated from Further Analysis

Alternatives that would not make significant progress toward meeting the objectives of the proposed action (section 1.2), or are not consistent with the intent of current BLM legal and regulatory requirements or policy, are not fully analyzed in this document. Alternatives that propose exclusive production or protection of one resource at the expense of other resources are 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, oil and gas leasing, or managing only for wildlife values at the exclusion of other considerations. In addition, resource conditions do not warrant watershed-wide prohibitions of any specific 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. The following alternatives were considered, but eliminated from detailed study.

2.2.1 Elimination of Livestock Grazing on BLM Administered Lands in the Madison 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.

- The recently updated and approved Dillon RMP identifies 31,785 acres of public land in the MW as open to livestock grazing and 6,915 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 “No Grazing” alternative was previously analyzed in the Mountain Foothills EIS (March 1980).
- Due to the intermixed land ownership pattern in the allotments included in the Madison Watershed, at least 105 miles of fence would need to be constructed between private and/or state land and BLM administered land to effectively implement a “No Grazing” alternative on BLM administered land. This figure does not include fencing around parcels that are essentially unavailable to livestock due to topography. Surveying and constructing 105 miles of fence along BLM boundaries would be cost prohibitive and cause an unacceptable level of barrier/entanglement hazard for big game within the Madison Valley.

2.2.2 Fuel Reduction Projects near Pony and North Meadow Creek

Several fuel reduction projects on BLM administered land in the area surrounding Pony and in North Meadow Creek were considered, but eliminated from detailed study due to the logistical constraints of mixed ownership and rugged terrain. Specific to the North Meadow Creek area, the steepness of the slopes and the large amount of vertical rock would restrict most kinds of mechanized fuels reduction treatments, and pose safety concerns for manual treatments on BLM administered land. Other opportunities to treat hazardous fuels in these areas may be pursued in the future.

2.2.3 Commercial Timber Harvest Treatments Requiring Helicopter Yarding

Commercial timber harvest treatments requiring helicopter yarding were considered, but eliminated from detailed study due to current lumber market conditions and the quickly degrading condition of dead and dying timber. Helicopter yarding is sometimes required for treatment units on steep ground, with limited access for ground-based equipment. It is the most expensive form of logging, costing an average of \$425 per thousand-board-feet (MBF) (Hayes and Morgan, 2009). Due to the current value of timber being less than the cost of helicopter yarding, this type of logging method is not economically feasible at this time. Dead timber remains merchantable for approximately 2-5 years after dying, depending on the species, before decay makes the material unsuitable for saw-timber. Therefore, delay of treatment to allow for the lumber market to improve, is also economically infeasible, and was eliminated from detailed study.

2.3 Description of Alternatives

2.3.1 Features Common to All Alternatives, Including the No Action

Livestock Management

Term Grazing Leases for 22 allotments that have been determined to **not** have resource issues or concerns relating to current livestock management, or where administrative changes are not

proposed under Alternatives B and/or C, would be reissued. These allotments are: Billie Mine Isolated, Carter, Cliff Lake, Corral Creek, Dehaan, Easter, Flying D, Glen Kyle, Jourdain Creek, Kelly Meridian, Maltby's Mound, Michel, Mill Creek-Gustin, North Indian Creek, North Meadow Creek, Parent Isolated, Pony Gulch, Sun Ranch Isolated, Trout Creek, Wall Creek AMP, Wall Creek Game Range and Willow Creek.

The BLM encourages, and if warranted, will 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 on ridges or terraces at least ¼ mile from the nearest livestock water source.

Projects

- All water developments and troughs no longer in use will be removed, but spring enclosure fences may be retained and maintained. Wildlife escape ramps will be installed in all water troughs.
- Existing BLM fences that impede wildlife movement will be modified or rebuilt to BLM specifications on a prioritized schedule. Dysfunctional or unnecessary fences on public land in the following allotments will be removed, modified, and/or rebuilt: Easter, Trail Creek C&H AMP, Elmer, Shirley, Windy Pass AMP, Strawberry Ridge, Willow Creek, Preacher Creek AMP, Wallace Peak AMP, Sitz, Revenue Common AMP, Ledyard-McGuinness, Axolotl Lakes, MVHP, Wall Creek AMP, and Michel.
- Remove the dysfunctional Canada goose nest boxes on Wall Creek AMP.
- Continue to look for opportunities to maintain water levels in Axolotl, Reservoir and Twin Lake through water leasing from current water right holders or improvements to current water control structures.
- Continue coordination with PPL Montana and Montana Fish, Wildlife and Parks (FWP) on flow regulations of the Ennis Lake and Hebgen Lake dams to improve water quality and fisheries habitat.
- Coordinate with Montana FWP to further educate river users in the methods to stop the spread of invasive species, e.g. whirling disease, New Zealand mud snails, Eurasian water milfoil, either into the Madison River or from the Madison River to another body of water.

Fire Management

The management of naturally occurring wildfire in the Bear Trap Wilderness Area will continue as defined in the Bear Trap Unit of the Lee Metcalf Wilderness Area Fire Management Plan. As stated in the Dillon RMP, the BLM's goal is to manage this area for the preservation of natural conditions and processes, including fire.

Travel Management and Roads

Travel management will be implemented as prescribed in the Dillon RMP. Roads identified as open to public use will be signed with a white arrow symbol on a flexible sign post. Roads not identified as open to public use would be:

- Left unsigned unless there is evidence of regular use.
- Signed closed if there is evidence of regular use.

- If signing is ineffective at discouraging use, roads would be obliterated to the extent possible (made unnoticeable), at least at the intersection with an open route, or physically closed when continued use is causing significant unacceptable resource impacts or user conflicts.

Noxious and Invasive Species

Management of noxious weeds will continue in cooperation with Madison County, federal and state agencies, private landowners and other partners. All invasive species on the Montana state noxious weed list will be treated to the degree financial 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 implementation of the Bear Trap Wilderness Weed Management Plan and update within the next two years.

The Madison River Sheep grazing project will continue pending adequate financial and other resources as well as private landowner cooperation.

Special Status Species

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

Term grazing permits shall be amended in migration/dispersal corridors to state that depredation losses from wolves are possible. In areas where grizzly bear conflicts may occur with livestock, grazing permits will be amended to state that depredation losses from grizzlies are possible.

The only known sage grouse lek in the MW is on private property at the southern end of the watershed. This lek has not been active since the late 1980's/early 1990's. Sage grouse are still seen in this area during the nesting and brood-rearing seasons. The BLM, in cooperation with other agencies and partners, will continue to look for leks in this area, as well as throughout the watershed.

Sage grouse were historically found on the Revenue Common and North Meadow Creek allotments, but have not been documented in recent years. On these allotments and allotments with sagebrush habitat throughout the MW, BLM will maintain existing sagebrush habitat so that 75% or more of big sagebrush communities provide vegetative composition and structure for sagebrush obligate species. As sage grouse habitat is delineated, BLM will maintain nesting/early brood rearing canopy cover of 15–25% sagebrush and an average of 6 to 7 inches herbaceous understory within site potential, maintain brood rearing canopy cover of 15–25% sagebrush near riparian areas or wet meadows while maintaining available forbs in the wet meadows, and maintain or increase composition of highly nutritious forbs (e.g., composites and legumes) in nesting/early brood rearing habitat.

Inventory and map the Hiker's gentian population 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.

Wilderness

The Bear Trap Wilderness Area will continue to be managed in accordance with the Wilderness Management Plan for [the] Bear Trap Canyon Unit of [the] Lee Metcalf Wilderness (1984) and the Limits of Acceptable Change Management Direction (1991). Any changes to management in the Bear Trap Canyon Wilderness will be considered as part of a wilderness management plan update that will be completed in coordination with the Lee Metcalf Wilderness Coordinating Committee no later than 2011. This will include consideration of the management of open fires in the Bear Trap Canyon Wilderness and future access to the Bear Trap repeater. These plans will be in accordance with direction provided in the Dillon RMP. The Axolotl Lakes WSA will continue to be managed in accordance with the Interim Management Policy for Lands Under Wilderness Review (BLM Handbook H-8550-1).

Recreation

Dispersed recreational activities will continue to be managed consistent with other resource management objectives. Special Recreation Permits will continue to be considered on a case-by-case basis with the exception of big game hunting. Outfitted big game hunting will continue to be limited to existing permits and use levels. Opportunities for big game hunting, wildlife viewing, horseback riding, and other backcountry recreation would be maintained.

Developed recreation sites will continue to be maintained and improved as necessary to address recreation-related demands and impacts on resources along the Madison River.

Cultural Resources

As required by Section 106 of the National Historic Preservation Act, a Class III cultural resource inventory is required 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 project. In addition, personnel from the BLM should be notified of the presence and location of any cultural resources encountered by contractors or lessees during the course of operations on public lands.

Monitoring

Under all alternatives, resource monitoring will be implemented to measure progress toward meeting site-specific objectives. Monitoring will be done according to the monitoring plan shown as Appendix B.

2.3.2 Description of Alternative A - No Action (Continuation of Current Management)

No Action is defined as the continuation of current management. This alternative will be analyzed to serve as baseline information for the Authorized Officer to make a reasoned and informed decision.

Livestock Grazing Management

Under Alternative A, livestock management would continue under the current Terms and Conditions in all 39 grazing allotments (Table 1.2). No new range improvement projects would be constructed.

Table 2.1: Grazing Allotments Summary

Allotment number category	Grazing Authorization Number	Season of Use	Livestock Number and Kind	Grazing System	Stocking Rate on BLM	BLM Active AUMs	BLM Acres	Acres in Other Ownerships	Total Acres
Aspen Creek #10540 (I)	2505793	05/15-11/14	11 cattle	Seasonal	10 acres/AUM	67	683	1471 (Private)	2154
Axolotl Lakes #20485 (I)	2500116	06/20-11/18	245 cattle	Deferred rotation	3 acres/AUM	406	2427	1858 (Private)	4296
	2505710	06/26-09/15	135 cattle	Deferred rotation		357		11 (Forest Service)	
Bar Seven #10457 (C)	2505710	05/01-02/22	50 cattle	Seasonal	5 acres/AUM	345	1575	169 (State) 4016 (Private)	5760
Billie Mine Isolated #20403 (C)	2505810	05/15-06/30	46 cattle	Seasonal	3 acres/AUM	69	192	490 (Private)	682
Carter #20386 (C)	2500189	11/01-02/01	3 cattle	Seasonal	10 acres/AUM	9	91	0	91
Cliff Lake #10437 (C)	2505804	05/01-11/30	1 cattle	Seasonal	4 acres/AUM	7	29	378 (Private)	385
Corral Creek #10543 (C)	2505797	06/01-09/30	3 cattle	Seasonal	34 acres/AUM	12	405	0	405
Dehaan #20390 (C)	2505657	05/01-11/30	2 cattle	Seasonal	13 acres/AUM	8	105	0	105
Easter #20393 (C)	2505660	05/28-02/28	15 cattle	Seasonal	7 acres/AUM	137	1012	0	1012
Elmer #20394 (C)	2505661	07/01-10/08	21 cattle	Seasonal	3 acres/AUM	76	256	0	256
			2 horses						
Flying D #20420 (C)	2505733	03/01-06/10	7 indigenous	Seasonal	9 acres/AUM	64	591	41 (Private)	632
		10/16-02/05							
Glen Kyle #20412 (C)	2505643	06/20-10/25	9 cattle	Seasonal	8 acres/AUM	38	285	2 (Private)	287
Jourdain Creek #20410 (C)	2505689	06/06-10/15	5 cattle	Seasonal	21 acres/AUM	20	419	2024 (Private)	2443
Kelly Meridian #10539 (C)	2505793	05/15-06/30	22 cattle	Seasonal	6 acres/AUM	32	178	1070 (Private)	1248
Ledyard-McGuinness #20416 (C)	2502428	06/16-09/14	25 cattle	Seasonal	5 acres/AUM	75	336	144 (Private)	803
								323 (State)	
Maltby's Mound #30402 (C)	2505804	04/01-01/31	5 cattle	Seasonal	6 acres/AUM	52	289	416 (Private)	3417
								2712 (State)	
McAtee Bridge #10529 (I)	2500064	04/15-06/30	13 cattle	Seasonal	5 acres/AUM	92	456	3546 (Private)	4508
		09/01-10/31						506 (State)	
Michel #20417 (C)	2505683	06/01-10/31	5 cattle	Seasonal	2 acres/AUM	25	54	316 (Private)	370
Mill Creek-	2505718	05/01-	14 horses	Seasonal	9 acres/	23	202	1310 (Private)	1512

Allotment number category	Grazing Authorization Number	Season of Use	Livestock Number and Kind	Grazing System	Stocking Rate on BLM	BLM Active AUMs	BLM Acres	Acres in Other Ownerships	Total Acres
Gustin #10465 (C)		05/31	9 cattle		AUM				
MVHP #10550 (I)	2505652	06/10-10/20	7 cattle	Seasonal	17 acres/AUM	30	519	0	519
North Indian Creek #10140 (C)	2505652	05/27-07/05	67 cattle	Seasonal	6 acres/AUM	29	165	328 (Private)	493
North Meadow Creek #10380 (C)	2505647	05/20-10/19	27 cattle	Seasonal	8 acres/AUM	136	1043	895 (Private)	1938
North Morgan #20423 (C)	2505667	05/01-05/31	11 cattle	Seasonal	15 acres/AUM	11	167	1887 (Private)	2054
Parent Isolated #20406 (C)	2501600	06/01-10/30	1 cattle	Seasonal	13 acres/AUM	6	76	541 (Private)	617
Pony Gulch Isolated #20405 (C)	2505810	07/01-10-30	7 cattle	Seasonal	13 acres/AUM	28	371	1848 (Private) 15 (State)	2234
Preacher Creek AMP #20404 (M)	2505804	06/25-11/01	100 cattle	Deferred Rotation	6 acres/AUM	124	753	1365 (Private)	2118
Red Bluff #00982 (C)	2500153	06/15-08/14	110 cattle	Seasonal	4 acres/AUM	220	815	0	815
Revenue Common AMP #20407 (I)	2501600	06/01-10/30	135 cattle	Rest-Rotation	6 acres/AUM	283	2119	1838 (Private)	4446
	2505810	06/01-07/30	27 cattle			65		489 (State)	
Shirley #10436 (C)	2505700	11/15-01/04	32 cattle	Seasonal	10 acres/AUM	64	665	355 (Private)	1020
Sitz #00438 (C)	2500186	03/01-12/31	2 cattle	Seasonal	8 acres/AUM	18	150	2 (State)	152
Strawberry Ridge AMP #10421 (I)	2505643 & 2504687	07/01-09/14	305 cattle	Deferred Rotation	7 acres/AUM	294	2020	2239 (Private)	3061
								383 (Forest Service)	
								439 (State)	
Sun Ranch Isolated #20460 (C)	2505070	05/15-11/14	4 cattle	Seasonal	14 acres/AUM	24	344	0	344
Trail Creek C&H AMP #30401 (M)	2505689	07/01-07/09	220 cattle	Split Season	25 acres/AUM	83	2083	26 (Private)	9025
		09/27 - 10/05						6916 (Forest Service)	
Trout Creek #20496 (C)	2505746	07/01-09/30	12 cattle	Seasonal	100 acres/AUM	3	301	317 (Private)	621
								3 (Forest Service)	
Wall Creek AMP #10522 (M)	2505774	06/01-09/05	150 cattle	Rest Rotation	4 acres/AUM	214	810	858 (Private)	1668
Wall Creek Game Range #00819 (C)	2500027	05/01-06/02	33	Rest Rotation	13 acres/AUM	36	455	0	455
		09/23-09/30							

Allotment number category	Grazing Authorization Number	Season of Use	Livestock Number and Kind	Grazing System	Stocking Rate on BLM	BLM Active AUMs	BLM Acres	Acres in Other Ownerships	Total Acres
Wallace Peak AMP ##10447 (M)	2505810	07/01-09/30	166	Seasonal	11 acres/AUM	100	1096	1110 (Private)	2802
								596 (State)	
Willow Creek #10440 (C)	2500198	07/16-10/30	34 cattle	Deferred rotation	5 acres/AUM	120	614	0	614
Windy Pass AMP #20385 (M)	2505687	09/01-09/14	200 cattle	Seasonal	18 acres/AUM	46	840	455 (Private)	1297

Under the No Action Alternative, all other currently authorized activities (recreation permits, mineral development, etc.) would continue as permitted. No forest and woodland treatments, changes to travel management designations, or other vegetative treatments would be implemented. Treatment of noxious weeds would continue as in the past with roads, trails, and washes (spread vectors) being the primary targets. An average of 325 acres would be treated with herbicides annually within the MW under the No Action Alternative.

2.3.3 Features Common to All Action Alternatives

This section covers proposed actions and project design features that would be implemented regardless of the action alternative or combination of alternatives chosen by the Authorized Officer.

Livestock Management

- Livestock management changes would be initiated during the 2011 grazing season. Implementation which is dependent on other proposals, e.g. rangeland projects, may take up to five years, due to financial, logistical, or other constraints.
- AUMs reduced from current active use would be held in suspended non-use on the revised Term Grazing Permits.
- Annual utilization guidelines on cool season bunch grasses would be 50% (to maintain plant health/vigor) or when livestock use on sedges along the greenline in riparian areas averages four inches, 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 MW 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.
- With prior approval, flexibility would be authorized for the season of use on each allotment if annual weather conditions and forage production warrant. The turnout date may be adjusted up to seven days earlier or later than specified on the permit due to yearly variations in weather affecting forage production. Livestock may need to be removed from a specific pasture prior to the maximum number of days specified in the grazing schedule. If this occurs, the time allocated in subsequent pastures would 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.
- After consultation with the BLM, and written approval, lessees may be required to adjust

the pre-planned pasture grazing sequence (AMP) due to drought or other unforeseen natural events. Also, with prior approval, more livestock may be grazed for a shorter period within the authorized season of use. However, the maximum authorized AUMs, or season of use, as specified in the Term Grazing Leases cannot be exceeded by allowing this flexibility.

- Permittees or lessees shall provide reasonable administrative access across private and leased lands to the BLM for the orderly management and protection of the public lands.
- Red Bluff allotment #00982
 - The Cooperative Agreement between the Montana Agricultural Experiment Station and the Dillon Field Office of the BLM concerning grazing management on BLM administered lands within the Red Bluff Experiment Station will be reviewed, evaluated and, if needed, updated. Changes may include the development and implementation of an allotment management plan (AMP) with specific terms and conditions limiting livestock numbers and season of use on the Red Bluff grazing allotment.
- Michel allotment #20417
 - Remove mining related material and debris in or adjacent to Bradley Creek.
 - Modify ½ mile of five-strand barbed wire fence along Bradley Creek road to four-strand barbed wire in accordance with BLM specifications.

Forest and Woodland Treatments

The following design features would be common to all Forest and Woodland Treatments (Commercial Harvest, Permitted Wood Product Removal, Whitebark and Limber Pine Protection/Enhancement and Non-Commercial Mechanical/Prescribed Fire Units).

- State of Montana Best Management Practices (BMPs) and the Streamside Management Zone (SMZ) laws would be followed for all treatments or road activities in or near riparian areas. Guidelines as described in the Montana SMZ law (available at <http://www.mt.nrcs.usda.gov/technical/ecs/forestry/technotes/forestryMT18/>) would be the minimum standard design features unless alternative practices authorizations are obtained.
- If market conditions permit, biomass material may be removed from within treatment units. Sufficient residual biomass material would be left on site to maintain nutrient recycling and desirable micro-site conditions.
- Existing roads which are not designated open routes may be used for Forest and Woodland Treatments, and would be physically closed following completion of use.
- Forest and Woodland Treatment units would be monitored for noxious weeds and cheatgrass, and treated if necessary.
- Forest and Woodland Treatment units would be surveyed for goshawk nesting prior to implementation. If a goshawk nest is found in a treatment unit, timing stipulations would be enforced to avoid disturbing nesting activity.
- All operations would be prohibited from May 15 – June 30 (elk calving season) in the Aspen Creek treatment unit.

Commercial Harvest Treatments

- Unit boundaries for commercial harvest units are shown on Maps 2-5 in Appendix A. Actual harvested areas would be within the units identified, but may not cover the entire

area within unit boundaries.

- Within commercial harvest units, conventional ground-based harvesting equipment would be used. Ground based harvest techniques would include hand or machine felling (on slopes <45%) and then tractor and/or cable yarding the merchantable timber to landings. Ground-based harvest equipment generally requires 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. The timber sale contract would be made available to the general public upon advertisement of the sale.
- Off road vehicles and equipment would be required to be pressure washed to remove weeds and weed seeds prior to starting operations.
- Harvest activity and associated operations would be allowed year-round, except in the Aspen Creek treatment unit as specified above.
- Log landings would be located in areas free of, or treated for, noxious weeds. Upon completion of use, landings would be reseeded with native grasses/forbs.
- Use of existing roads would be evaluated on a case-by-case basis to determine if additional safety and/or watershed protection measures would be needed. Upgrades may include but would not be limited to: blading, filling in low spots, installing drain dips, and minor re-routes of up to 500 feet.
- 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. Exact road locations may be adjusted for archaeological and/or sensitive plant clearances, to avoid wet areas, to adhere to SMZ laws, to provide best access for yarding, or to reduce the amount of road building. Road mileage amounts identified in this EA would not be exceeded without additional NEPA clearance.
- 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 closures would be accomplished by constructing berms and/or placing slash material on the road surface to preclude vehicle use and reseeded with native grasses/forbs.
- Prescribed burning treatments to consume residual slash and/or to kill understory conifers less than 30 feet tall may be completed within all commercial harvest units, and would take place within five years following completion of harvest operations.
- A food storage stipulation would be included in timber harvest contracts in areas where grizzly conflicts may occur.

Whitebark and Limber Pine Protection/Enhancement

- Cones would be collected on whitebark and limber pine trees suspected to be resistant to white pine blister rust to be sent for testing to determine their resistance level. Pheromones (e.g., verbenone) or insecticide (e.g., carbaryl) would be applied to these trees to protect them from attack by mountain pine beetle. Additional cones may be collected to be sent to the national seed bank and genetic restoration program.
- Planting of whitebark pine seedlings may be conducted in whitebark pine habitat burned by wildland fire, as well as in other suitable areas.
- In the Axolotl and Windy Pass AMP allotments, competing conifers may be cut within the immediate vicinity of healthy whitebark pine trees to reduce the likelihood of being damaged in the event of a wildfire.

- Actions completed for the protection/enhancement of whitebark and limber pine within the Axolotl WSA would be conducted in compliance with the Interim Management Policy for Lands Under Wilderness Review.

Non-Commercial Mechanical/Prescribed Fire

- A burn plan would be completed prior to implementing prescribed burns.
- One season of rest from livestock grazing may be needed prior to burning to allow sufficient growth of fine fuels (grasses) to ensure a successful burn. Generally, two growing seasons of rest from livestock grazing would be required following burns to allow re-growth and re-establishment of vegetation in the treated areas.
- Temporary fencing or hot tape (electric fence) may be used to allow the appropriate rest before or after the prescribed burns.

Riparian Juniper Treatments

- In riparian juniper treatments, the goal would be to mechanically kill/remove 100% of the Rocky Mountain juniper within the riparian zone. A range of 80 – 95% juniper mortality would be considered successful. These treatments may be followed by seeding with an appropriate native seed mix depending on the current canopy cover of juniper and herbaceous understory composition and cover.
- Mechanical treatments would extend a maximum of 100 feet from the stream centerline on each side of the stream. Mechanical or manual treatments would consist of sawing down the junipers with chainsaws and/or other hand tools.
- No new roads or stream crossings would be constructed to complete the riparian juniper treatments.
- The felled juniper would be oriented along the stream bank to mitigate potential erosion and stream banks impacts by authorized livestock and wild ungulates.
- Felled trees would not be left within the flood prone area of the stream reach.
- Pre-treatment weed inventory/control and post treatment weed control would be completed within each unit.
- Implement appropriate post-treatment livestock management on all riparian juniper treatment areas to allow woody and herbaceous plant restoration. Post treatment management would include a minimum of two growing seasons of rest from livestock use to allow vegetative response from existing or seeded understory vegetation. Tools such as orienting the felled juniper along the stream, temporary fencing or hot tape may be used to allow the appropriate rest.

Noxious and Invasive Species

- Any new noxious weed infestations would be targeted for prompt eradication before they have a chance to get well established.
- Seed head weevils, *Larinus minutus*, root boring weevils, *Cyphocleonus achates*, and root boring moths, *Agapeta zoegana*, would be released as biological control agents on larger infestations of spotted knapweed to reduce the plant's competitiveness and help control the spread of knapweed by reducing seed production.
- Flea beetles, *Aphthona lacertosa* and *Aphthona nigriscutis*, stem boring beetles, *Oberea erythrocephala*, and leafy spurge hawk moths, *Hyles euphorbiae*, would be released as biological control agents on large infestations of leafy spurge, specifically in the Flying D

and Shirley allotments and the un-allotted parcel managed by the Montana State University (MSU) Agriculture Research Station at Red Bluff.

- When a biological control becomes available for houndstongue it would be considered for release on infestations within the watershed.
- Set up study plots to determine the best method (herbicide) for treating spotted knapweed infestations where spiny skeletonweed is present.
- Aerial application of herbicides would not occur during migratory bird nesting between April 15th and August 1st depending on the current year's weather and its effect on timing of nesting. Aerial application would occur prior to mule deer and elk arrival on winter range to avoid disturbing these species.

Special Status Species

- Complete inventory for spiny skeleton weed and railhead milkvetch prior to any aerial treatment of spotted knapweed or leafy spurge. Avoid, with aerial treatment, populations or individuals that are located outside of the densest infestations of leafy spurge or spotted knapweed. Where possible collect seed from skeleton weed and railhead milkvetch to seed back into treated areas.

Water Developments

- All applicable State and Federal Permits would be obtained and the terms and conditions applied.
- Spring sources and associated riparian wetland habitat would be fenced to exclude livestock use on developed springs.
- Flow measurements would be gathered at springs proposed for new development. Springs that have inadequate flows to provide a reliable water source for authorized livestock, while maintaining existing wetland/riparian habitat would not be developed. Adequate water would be left at the spring source to maintain wetland hydrology, hydric soils, and hydric vegetation.
- No new roads would be authorized as a result of water developments. Permit holders may be authorized to travel along pipeline routes to perform maintenance as defined in the term grazing permit.
- All old materials (pipeline, troughs, head boxes, etc) would be cleaned up and removed when springs are re-developed, maintained or abandoned.
- Soil disturbance resulting from pipeline installation would be seeded with a native seed mix during the fall, following construction.
- Remove the wood, metal and plastic troughs and associated materials from the spring located on un-allotted BLM administered land adjacent the Easter allotment in T4S, R1E, Section 18 restore to natural conditions.

Stream Crossings

- All applicable State and Federal Permits would be obtained and all permit conditions would be followed for construction of stream crossings.
- New stream crossings would be hardened crossings or temporary bridges, whichever better fits the resource and terrain.
- Temporary and/or permanent culverts placed under roads would be adequately sized to maintain stream dimensions, patterns and profiles.

Fences

- Any new or replacement boundary fences would normally be a four-wire fence and any new interior (pasture) fences would normally consist of three wires, constructed in conformance with BLM Fencing Handbook H-1741-1.
- High tensile electric fences would be considered in areas where they may provide an effective alternative to traditional barbed wire construction. These would also be constructed in conformance with BLM Fencing Handbook H-1741-1.
- Fences around springs or tanks would be modified to prevent avian predators from using posts as hunting perches. Modifications include installing spikes or cone-tops to wood posts, replacing wood posts with metal t-posts, and using metal t-posts instead of wood posts and jack and rail, where practical.

Travel Management

- Change designations for wheeled motorized vehicle travel in the Revenue Common AMP, North Meadow Creek and Kelly Meridian allotments and the Storey Property (maps 6 and 7 in Appendix A). The Dillon RMP provides direction for the updating and maintenance of the road and trail database to correct mapping errors and refine decisions. (RMP, p. 61, Action #5.) Changes include modifications of current designations, including establishment of some seasonal limitations.

2.3.4 Description of Alternative B

Livestock Management

Livestock management changes are being proposed for 11 grazing allotments in which current or historic livestock use has been determined to be one of the causal factors in at least one Rangeland Health Standard not being met. These allotments are: Aspen Creek, Bar Seven, Elmer, McAtee Bridge, North Morgan, Preacher Creek AMP, Revenue Common AMP, Shirley, Sitz, Wallace Peak AMP and Windy Pass AMP. In addition to the actions described above under 2.3.3, one or a combination of the following actions would be implemented: administrative changes, modification of grazing management plans, the construction or modification of range improvement projects, and/or the implementation of vegetative treatments.

In addition, livestock management administrative changes will be proposed for five allotments: MVHP, Axolotl Lakes, Strawberry Ridge, Trail Creek C&H AMP and Ledyard McGuinness, and the Storey Property even though all were determined to be in compliance with all five Standards of Rangeland Health during the assessment process.

Please refer to the allotment maps 2-14 in Appendix A to see the location and extent of the proposed rangeland improvement projects and administrative actions.

Aspen Creek #10540 (map #5)

Administrative Actions:

- Remove the North and Middle pasture from the Aspen Creek allotment.
- Change the boundaries of the Aspen Creek allotment to include only the South pasture.
- Adjust public land in South Pasture to 70%, based on relative number of AUMs on private and BLM public land.
- Designate the North pasture as a separate new allotment, Horse Creek allotment.

Horse Creek would be a custodial (C) allotment and would be billed as 100% public land and the lessee would be pre-billed for 9 AUMs.

Grazing Management:

- Use the South pasture for no more than 21 days between 07/01 and 07/31 annually as part of a three pasture seasonal rotation. Terms and conditions would include:
 - Authorize the operator to have the option to run up to 200 head for 15 days, harvesting up to 70 AUMs on BLM administered lands or;
 - Up to 140 head for 21 days, harvesting up to 67 AUMs on BLM administered lands.
- Season of use in the Horse Creek custodial would be from 08/15 to 10/31.

Projects:

- Develop a spring on private land in the upper SW ¼ of section 31, T10S R01E, and pipe water to a trough on BLM administered land in the SE ¼ of section 32.
- Cut dead or dying trees along reach #2035 and orient them across the stream at strategic locations.
- Buck up and/or re-orient existing downfall on the banks adjacent reach 2035 to allow the cattle passage further away from the channel and eliminate trailing within or directly adjacent to the stream.

Table 2.2: Proposed Authorized Use for Aspen Creek allotment, Alternative B

Allotment	Number/Kind	Begin Date	End Date	% Public Land	Active AUMs
Aspen Creek	95 Cattle	07/01	07/31	70	70

Table 2.3: Proposed Authorized Use for Horse Creek allotment, Alternative B

Allotment	Number/Kind	Begin Date	End Date	% Public Land	Active AUMs
Horse Creek	3 Cattle	08/15	10/31	100	9

Axolotl Lakes #20485 (map #9)

Grazing Administrative Actions:

Two administrative changes would be incorporated into the Axolotl Lakes ten year term grazing lease affecting use in the Gustin AB and Blue Lakes pastures.

- Delay the beginning of the grazing period in Gustin AB pasture by 14 days, and extend the end of the grazing period by 14 days. The begin date for this pasture would be changed from 07/01 to 07/15, and the end date adjusted from 10/01 to 10/15.
- Revoke the grazing authorization in the Blue Lake pasture and cancel 15 animal unit months (AUM) of forage allocated in the Blue Lake pasture from the grazing lease. Active AUMs would be reduced from 407 to 392.

Projects:

- Abandon and clean the Axolotl Lakes Spring development in an unallotted area of the Axolotl Lakes WSA in T7S R2W section 32.
- Construct an enclosure around the undeveloped spring and riparian habitat located in the Upper Combs pasture.

Table 2.4: Proposed Authorized Use in the Axolotl Lakes allotment, Alternatives B or C

Allotment	Pasture	Number/Kind	Begin Date	End Date	% Public Land	Active AUMs
Axolotl Lakes	Gustin AB	154 Cattle	07/15	10/15	30	141

Bar Seven #10457 (map #11)

Grazing Management:

- Specify fall season of use for the River pasture; 10/01 to 12/31.
- Designate the season of use for the Bench from 05/01 to 07/01.

Projects:

- Construct a two mile long three-strand high tensile electric fence along the River pasture boundary between BLM administered, private, and state lands in T8S R1W sections 10 and 15.
- Authorize and get Cooperative Agreement for long term maintenance on water development on BLM administered land in the Bench pasture in T7S R1W section 31.

Table 2.5: Proposed Authorized Use for Bar Seven allotment, Alternative B

Allotment	Pasture	Number/Kind	Begin Date	End Date	% Public Land	Active AUMs
Bar Seven	Bench	61 Cattle	05/01	06/30	27	67
	River		10/01	11/30		

Elmer #20394 (map #14)

Grazing Management:

- Authorize 23 cattle as the kind and number of livestock and concurrently cancel authorization for two horses.

Projects:

- Construct a four-strand barbed wire corridor fence enclosing approximately ¾ mile of Hot Springs Creek tributary #2036.
- Incorporate a hardened water gap for livestock access in the enclosure fence.
- In cooperation with Madison County, replace non-functional culvert under county road in T3S R1E section 19.
- Remove all old mining equipment, debris and/or hazardous materials from the area if they are not culturally significant.

Table 2.6: Proposed Authorized Use for Elmer allotment, Alternative B

Allotment	Number/Kind	Begin Date	End Date	% Public Land	Active AUMs
Elmer	23 Cattle	07/01	10/08	100	76

Jourdain Creek #20410 (map #10)

Projects:

- Complete approximately ½ mile of riparian juniper treatment along Trail Creek (reach 606), as described in section 2.3.3.

Ledyard-McGuinness #20416 (map #1)

Administrative Actions:

- Change the authorized season of use to a two year spring-fall deferred rotation. Cattle would be authorized in either the spring or fall for up to 45 days per year. The grazing schedule would be 05/01-06/14 during odd years, and 10/01-11/13 during even years.

Table 2.7: Proposed Authorized Use for Ledyard-McGuinness allotment, Alternatives B or C

Allotment	Number/Kind	Begin Date	End Date	% Public Land	Active AUMs
Ledyard McGuinness	12 Cattle	05/01	11/13	100	78

McAtee Bridge #10529 (map #7)

Administrative Actions:

- Classify 186 acres of BLM administered lands in the South A pasture adjacent to the Madison River as unavailable for grazing.
- Reduce the authorized number of AUMs on the grazing lease by 38 to 54, accounting for the amount of forage estimated to be in the South A pasture.

Grazing Management:

- Designate the season of use in the South B pasture as 05/15-06/30.
- Designate the season of use in the North pasture as 09/01-10/31.

Projects:

- Construct approximately 1¾ miles of three-strand barbed wire suspension fence along the county road south of the McAtee Bridge from the boundary of the State land to the cattle guard across the road at the entrance to the Ruby Creek camp ground.
- Install a cattle guard across right of way crossing South A pasture to a private residence.

Table 2.8: Proposed Authorized Use for McAtee Bridge allotment, Alternative B

Allotment	Pastures	Number/Kind	Begin Date	End Date	% Public Land	Active AUMs
McAtee Bridge	South B	15 Cattle	05/15	06/30	100	54
	North		09/01	10/31		

MVHP #10550 (map #12)

Administrative Actions:

- Reclassify the Madison Valley Holding Pasture (MVHP) allotment as unavailable for livestock grazing. Do not reissue the lease for the MVHP Association.

Projects:

- Remove approximately 1½ miles of unnecessary barbed wire fence.

North Morgan #20423 (map #13)

Grazing Management:

- Split the allotment into two pastures; Upriver and Downriver.
- Use one pasture in the spring and the other in the fall each year for 30 days. Spring use would be 05/01 – 05/31 and fall use would be 10/01-10/31.
- Rotate season of use in the two pastures between spring and fall.

Projects:

- Construct approximately ½ mile long three-strand barbed wire division fence making two pastures in T7S R1W section 33.

Table 2.9: Proposed Authorized Use for North Morgan allotment, Alternative B

Allotment	Number/Kind	Season	Begin Date	End Date	% Public Land	Active AUMs
North Morgan	64 Cattle	Spring	05/01	05/31	8	11
		Fall	10/01	10/31		

Preacher Creek AMP #20404 (map #4)

Grazing Management:

- Use the Rattlesnake and Preacher Creek pastures for 15 days, by up to 40 head of yearlings or dry cows, in either the spring between 06/25 – 07/31, or the fall between 09/01- 10/15.
- Rest the Rattlesnake and Preacher Creek pastures once every 4 years. The rest year would not necessarily be the same for both.
- Use in Canadian, Token and East pastures would primarily be in the fall after cattle return from the USFS allotment. Use would be for up to 30 days in two of the three pastures for a total of 60 days from 11/01 to 12/30. If one of the pastures is used during the optional spring season, it would not be re-grazed until the following fall (1½ years). The fall use pastures would receive complete rest one year in four. One of these pastures may be used in the spring for up to 30 days during seasons when one of the Upper pastures is rested.

Additional Terms and Conditions

- Spring option for lower pastures (Canadian Creek, Token and East) 05/15-06/15. Spring use for a specific pasture would exclude that pasture for fall use during the same grazing season.
- Fall option for upper pastures (Preacher and Rattlesnake Creek) 09/01-10/15. Fall use would not be in the same year as a spring grazing treatment and would be followed by rest the next spring.
- Regardless of seasonal flexibility, total use on each upper pasture (Rattlesnake, Preacher Creek) would not exceed 15 days, and total use on Canadian Creek would not exceed 30 days. Total AUMs harvested on BLM administered lands would not exceed 124.

Projects:

- Construct two three-strand barbed wire, or high tensile electric division fences to create the Rattlesnake and Preacher Creek pastures.

Table 2.10: Proposed Authorized Use for Preacher Creek AMP allotment, Alternative B

Allotment	Number/Kind	Season of Use	Pastures	Begin Date	End Date	% Public Land	Active AUMs
Preacher Creek AMP	134 Cattle	Spring	Rattlesnake and Preacher Creek	06/25	07/31	29	124
		Fall	Canadian, Token and East	11/01	12/30		

Revenue Common AMP #20407 (map #6)

Grazing Management:

- Incorporate a five pasture rest-rotation grazing system, resting one pasture every year.
- Limit use in any pasture to 30 days per season.
- Change the season of use from 06/01 - 10/30 to 06/15 – 10/15.

Projects:

- Protect Upper Revenue Spring and spring brook with an enclosure fence.
- Abandon and clean up the Lower Revenue Spring.
- Study feasibility to develop an off stream watering site in the Carmen pasture adjacent to reach 626.

Table 2.11: Proposed Authorized Use for Revenue Common AMP allotment, Alternative B

Allotment	Number/Kind	Year	Pastures	Begin Date	End Date	% Public Land	Active AUMs
Revenue Common AMP	179 Cattle (two operators)	1	Carmen	rest	rest	42	305
			Upper Lamb	06/15	07/14		
			Lower Lamb	07/15	08/13		
			Upper Revenue	08/14	09/12		
			Lower Revenue	09/13	10/12		
		2	Carmen	09/13	10/12		
			Upper Lamb	rest	rest		
			Lower Lamb	08/14	09/12		
			Upper Revenue	07/15	08/13		
			Lower Revenue	06/15	07/14		
		3	Carmen	07/15	08/13		
			Upper Lamb	06/15	07/14		
			Lower Lamb	rest	rest		
			Upper Revenue	09/13	10/12		
			Lower Revenue	08/14	09/12		
		4	Carmen	08/14	09/12		
			Upper Lamb	09/13	10/12		
			Lower Lamb	06/15	07/14		
			Upper Revenue	rest	rest		
			Lower Revenue	07/15	08/13		
5	Carmen	06/15	07/14				
	Upper Lamb	07/14	08/13				
	Lower Lamb	08/14	09/12				
	Upper	09/13	10/12				

			Revenue				
			Lower Revenue	rest	rest		

Shirley #10436 (map #8)

Grazing Management:

- Change the kind and number of livestock from 32 cattle to 12 horses.
- Designate the season of use as 11/15 to 02/28.
- Authorize the harvest of 63 AUMs of forage at 1.5 AUM per animal unit (AU).

Projects:

- Expand the enclosure around the Montana 32 Spring to encompass the entire wetland area, and install a new trough.

Table 2.12: Proposed Authorized Use for Shirley allotment, Alternative B

Allotment	Number/Kind	Begin Date	End Date	% Public Land	Active AUMs
Shirley	12 Horses	11/15	02/28	100	63

Sitz #00438 (map #4)

Administrative Actions:

- Include the Sitz allotment (a total of 150 acres in scattered parcels largely inaccessible to the public) 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. In the interim, the livestock management facilities that are in place would be authorized under section 4 of the Taylor Grazing Act and section 4120.3-3 of the Code of Federal Regulations (CFR).

Table 2.13: Proposed Authorized Use for Sitz allotment, Alternative B

Allotment	Number/Kind	Begin Date	End Date	% Public Land	Active AUMs
Sitz	2 Cattle	03/01	12/31	100	18

Storey Property (map #7)

Administrative Actions:

- Classify the Storey Property a Resource Reserve allotment in accordance with the Dillon RMP (page 43).
- Consider applications for use to facilitate resource management objectives on BLM administered public lands within the watershed for a variety of reasons including but not limited to: resting other allotments or pastures, provide an emergency option for lessees who are unable to use their BLM allotments due to temporary conditions, e.g., wildfire mitigation, BLM initiated projects, or to meet vegetation management objectives within Storey Property.
- Assign 141 AUMs of available forage on 990 acres of BLM administered lands (7 acres/aum).

Grazing Management:

- Consider grazing use under temporary non-renewable authorization in accordance with 43-CFR-4130.2.

- Designate the grazing season from 06/01 to 10/30, but use would be limited to no more than 30 days during any given year. Utilization would be authorized no more than two consecutive years.
- No more than 141 AUMs of forage would be harvested in a given year.

Projects:

- Construct 1¼ mile of three-strand barbed wire fence on the north boundary (T8S R1W sections 23 and 24).
- Install two cattle guards; one at the entrance to the pasture from state Highway 287 and another at the entrance to the boat launch parking lot and facilities.
- Continue the jack and rail fence parking lot border fence to encompass the entire recreational facility.

Strawberry Ridge AMP #10421 (map #2)

Administrative Actions:

- Adjust allotment boundary by removing 520 acres of private, State, and BLM administered lands from the allotment in T2S R3W sections 1 SW¼ SW¼; 2 S½ S½; 3 SE¼ SE¼; 11 NW ¼ and N½ NE¼; 12 NW¼ NW¼.
- Reduce AUMs in the allotment by 9 to 285; the number of AUMs on 160 BLM administered acres removed from the allotment and assigned to the Windy Pass AMP allotment.
- Reduce the number of authorized cattle from 305 to 260. The reduction, 15%, would be shared proportionally by the two authorized operators.
- Adjust the percent public land in the allotment to 40%.

Projects:

- Authorize the use of approximately ¼ mile long temporary electric drift fence on the ridge between Pony Creek and Cataract Creek (T2S R3W section 23 NE¼).

Table 2.14: Proposed Authorized Use in the Strawberry Ridge allotment, Alternatives B or C

Allotment	Number/Kind		Begin Date	End Date	% Public Land	Active AUMs
Strawberry Ridge	Operator #2505687	157 Cattle	07/01	09/14	40	285
	Operator #2505643	99 Cattle				

Trail Creek C&H AMP #30401 (map #10)

Grazing Management:

- Use the Trail Creek pasture during even calendar years, and use the Fall Creek pasture during odd calendar years.
- Add an additional term and condition to the Term Grazing Lease that states: “Riding and herding will be required to ensure cattle are only present on BLM administered lands in the allotment during the authorized season of use. Particular emphasis will concentrate on the Spring Creek drainage and riparian area.”

Table 2.15: Proposed Authorized Use for the Trail Creek C&H AMP allotment, Alternatives B or C

Allotment	Number/Kind	Begin Date	End Date	% Public Land	Active AUMs
Trail Creek C&H AMP	220 Cattle	07/01	07/09	63	41
		09/27	10/05		

Wallace Peak AMP #10447 (map #4)

Administrative Actions:

- Adjust the allotment boundary by removing from the allotment approximately 250 acres of private and state land on the east end of the Mill Field pasture.
- Adjust percent public land to 43%.

Grazing Management:

- Designate the season of use as 07/01-09/28 (90 days).
- Limit use period to 30 days in each of the three grazed pastures
- Reduce the number of authorized cattle from the current level of 166 to 110.
- Implement a four pasture rest-rotation system.

Projects:

- Build a new ¼ mile three-strand barbed wire drift fence dividing the Taylor Pasture into two grazing units (T3S R2W section 15).
- Develop a spring on State land in cooperation with MT Department of Natural Resources and Conservation (DNRC) in the Miller Field (T3S R2W section 23) for use by livestock.
- Abandon and clean up the Wallace Spring development.

2.16: Proposed Authorized Use for Wallace Peak AMP allotment, Alternative B

Allotment	Number/Kind	Year	Pastures	Begin Date	End Date	% Public Land	Active AUMs
Wallace Peak AMP	110 Cattle	1	Miller	08/30	09/28	20	65
			N. Taylor	07/31	08/29		
			S. Taylor	07/01	07/30		
			Mill	rest	rest		
		2	Miller	07/31	08/29		
			N. Taylor	08/30	09/28		
			S. Taylor	rest	rest		
			Mill	07/01	07/30		
		3	Miller	rest	rest		
			N. Taylor	07/01	07/30		
			S. Taylor	07/31	08/29		
			Mill	08/30	09/28		
		4	Miller	07/31	08/29		
			N. Taylor	rest	rest		
			S. Taylor	07/31	08/29		
			Mill	07/01	07/30		

Windy Pass AMP #20385 (map #2)

Administrative Actions:

- Adjust the allotment boundary by including 520 acres of BLM administered land, private and state land from the Strawberry Ridge allotment into the Windy Pass allotment (T2S R3W Section 11 NW ¼).
- Designate the additional acreage the Gathering pasture.
- Change the northeast boundary corner of the allotment (T2S R3W Section 2 NW ¼) to exclude the private land that is now in the allotment. This would remove approximately 424 acres of private land from the allotment.
- Adjust the percent public land in the allotment from 46% percent to 78% to account for the boundary changes and net changes in the private, State and BLM administered lands within the allotment.

- The number of public land AUMs in the Windy Pass allotment would be increased by 9, to 55, and concurrently reduced by the same number in the Strawberry Ridge allotment accounting for the boundary change.

Grazing Management:

- Authorize livestock use in the upper Windy Pass allotment for 141 cattle for 15 days every other year from 07/01 to 07/15.
- Authorize the lessee to trail cattle across the Southeast corner of the allotment during the rest year (up to five days) to access the Strawberry Ridge allotment. Lessee would be billed for 18 AUMs based on 140 head for five days.
- Authorize the Gathering Pasture for use each year for up to 10 days in the fall to gather cattle off the Strawberry Ridge allotment.

Projects:

- Construct and/or maintain up to ½ mile of four-strand barbed wire fence across BLM and State lands in T2S R3W sections 11(NW ¼) and 2 (SW¼) to create the Gathering pasture.
- In cooperation with DNRC, pipe water from a headbox located in lower Antelope Creek tributary (# 2046) on BLM administered land to a watering trough on State land in T2S R3W.
- Maintain existing and/or re-construct new four-strand barbed wire fences between private land and BLM administered land in the area where private land is being excluded from the allotment (T2S R3W section 2 NW¼).
- Cut and orient dead or dying Douglas fir trees around the spring and wetland complex to protect the head waters of Antelope Creek tributary, reach 666.

Table 2.17: Proposed Authorized Use for Windy Pass allotment, Alternative B

Allotment	Number/Kind	Pastures	Year	Begin Date	End Date	% Public Land	Active AUMs
Windy Pass	141 Cattle	Windy	1	07/01	07/14	79	55
			2 trailing	07/01	07/05		
		Gathering	1	09/14	09/23		
			2				

Forest and Woodland Treatments

Alternative B would allow salvage harvest of dead/dying timber, sanitation harvest of live trees, thinning of high density conifer stands, harvest of conifers in and around aspen stands, and opportunities for commercial removal of biomass as well as public utilization of forest products. Non-commercial mechanical treatments and/or prescribed fire would also be allowed to reduce residual slash after harvest activities, reduce fuel loading adjacent to WUI areas, promote aspen, and reduce conifer expansion into aspen, sagebrush and grasslands. Additionally, whitebark and limber pine protection/enhancement would occur as described above in section 2.3.3.

Table 2.18 outlines the proposed units, objectives, treatment types and the affected allotments under Alternative B. Unit locations and boundaries are shown on Maps 2-5, Appendix A.

Table 2.18: Forest and Woodland Treatment Units, Alternative B

Unit Name	Allotment	Acres	Objective(s)*	Treatment Type(s)
Windy 1	Windy Pass AMP	73	Salvage dead/dying timber	Permitted removal of wood products
Windy 2	Windy Pass AMP	121	Salvage dead/dying timber	Permitted removal of wood products
Charcoal 1	Strawberry Ridge	129	Salvage dead/dying timber, reduce fuel loading adjacent to WUI	Permitted removal of wood products
Strawberry 1	Strawberry Ridge	114	Salvage dead/dying timber, reduce fuel loading adjacent to WUI	Permitted removal of wood products
Cataract 1	Strawberry Ridge/Glen Kyle	132	Salvage dead/dying timber, protect allotment fence	Permitted removal of wood products
Aspen Creek	Aspen Creek	350	Reduce fuel loading adjacent to WUI, enhance/maintain aspen and meadows	Non-commercial mechanical/prescribed fire
Preacher 1	Preacher Creek AMP	59	Salvage dead/dying timber, enhance aspen	Commercial harvest
Preacher 2	Preacher Creek AMP	121	Salvage dead/dying timber, enhance aspen	Commercial harvest

Description of Forest and Woodland Treatment Types

Also see section 2.3.3, Features Common to Alternatives B and C for additional design features.

Commercial harvest – Up to 180 acres of commercial harvest treatment within two treatment units is proposed under Alternative B. The silvicultural prescription would focus on the salvage harvest of dead and dying trees, removing up to 90% of dead trees. Up to 100% of green trees with evidence of successful beetle attack would also be harvested and removed. In mixed conifer and Douglas-fir stands, green trees would be thinned across all diameters, with focus on leaving those with healthy crowns and minimal budworm damage, to create a residual stand with an average basal area of 80ft²/acre with a range from 20-100ft²/acre.

Where viable aspen stands exist (defined as five or more live stems greater than 1” DBH), all merchantable size conifers within one aspen tree height of the aspen stand would be cut. Where possible, non-merchantable conifers within the same areas would be cut and left on-site as a browse barrier.

Healthy spruce and five needle pines (limber and/or whitebark pine) would not be cut unless they were deemed a safety hazard or were within aspen treatment areas. At a minimum, an average of two to five existing snags or green recruitment snags would be left per acre within treatment units. Priority of snags to be left would be given to those with evidence of wildlife use or with wildlife-use characteristics such as forks, broken tops, or large horizontal branches. Scattered patches of uncut timber would be left within treatment units to provide hiding cover and break up sighting distances.

For the Preacher 1 unit, up to 0.3 miles of new temporary road would be constructed, extending the existing road on the ridgeline at the top of the unit. Wood products would be cable yarded up to this road. For the Preacher 2 unit, up to 0.5 miles of new temporary road would be constructed, extending the existing road. Wood products would be cable and/or tractor yarded to this road.

Permitted removal of wood products – Making permits available to the general public for the harvest and removal of wood products on up to 569 acres within five treatment units is proposed in Alternative B. These permits would differ from the traditional personal use firewood permit by allowing the use of mechanized equipment (e.g., skidder, tractor, 4-wheeler), allowing commercial re-sale of the product if desired by the purchaser, and allowing products to be removed at any length (rather than the 6’ or less length piece requirement in the personal use firewood permit). Removal of wood products from these units would use existing roads only. There would be no new road construction allowed for treatment of these units. Permit conditions would allow harvest of dead and dying trees only. These would primarily be beetle-attacked lodgepole pine, but may also include heavily defoliated or beetle-attacked Douglas-fir. All slash material generated from cutting would be piled by hand or mechanical means for future burning by BLM personnel.

To access the Cataract 1 unit, a hardened crossing would be constructed in Cataract Creek at T2S R3W section 22 SW¼. Access to the unit would be open for firewood cutting only and road use would be limited to summer and fall (July 1 to October 15) and signed accordingly. Under this alternative no additional stream crossing would be necessary anywhere in the MW.

Non-commercial mechanical/prescribed fire – Up to 350 acres of non-commercial mechanical/prescribed fire treatment within the Aspen Creek treatment unit is proposed under Alternative B. Treatment would aim to promote and maintain aspen stands and meadows. The objective of the treatment would be to promote an aspen vegetation community rather than a conifer dominated vegetation community adjacent the Sun West subdivision. Treatments would include a combination of cutting, piling and burning unmerchantable conifers; girdling unmerchantable conifers; and/or mechanical mastication or chipping unmerchantable conifers. Isolated conifers within aspen stands may be cut and the slash scattered to less than 18 inches in depth.

Noxious and Invasive Species

Alternative B would allow for the increased treatment of noxious weeds through the use of biological, chemical and mechanical management methods (Map 15, Appendix A).

- Use herbicide (both ground and aerial application) and insect biocontrol to reduce the competitive advantage of the leafy spurge on the Flying D, Elmer, Red Bluff and Shirley allotments.
- Aerially apply herbicide on up to 1000 acres in the Shirley, Bar Seven, McAtee Bridge and the Wall Creek Game Range allotments for the control of spotted knapweed.
- Use herbicide to treat the noxious weed infestations on the Michel allotment and reseed bare ground areas once the old mining materials are removed.

2.3.5 Description of Alternative C

Livestock Management

There are some proposed administrative, grazing management and project features listed under alternative C that are carried over from alternative B. Please, refer to table 2.4, *Comparison of Proposed Livestock Grazing or Administrative Alternatives by Allotment*, to compare specific proposals under alternatives A, B and C.

Aspen Creek #10540

Administrative Actions:

- Remove the North and Middle pasture from the Aspen Creek allotment.
- Change the boundaries of the Aspen Creek allotment to include only the South pasture.
- Designate BLM administered land in the North pasture as unavailable for livestock grazing.

Grazing Management:

- In addition to the terms and conditions under Alternative B, the South pasture would be rested one of three grazing seasons.

Projects:

- Same as Alternative B

Table 2.19: Proposed Authorized Use for Aspen Creek allotment, Alternative C

Allotment	Year	Number/Kind	Begin Date	End Date	% Public Land	Active AUMs
Aspen Creek	1 use	95 Cattle	07/01	07/31	70	70
	2 use					
	3 rest					

Bar Seven #10457

Grazing Management:

- In addition to the terms and conditions under Alternative B, the River pasture would be rested one of three grazing seasons.

Projects:

- Same as Alternative B

Table 2.20: Proposed Authorized Use for Bar Seven allotment, Alternative C

Allotment	Number and Kind	Pastures	Year	Begin Date	End Date	% Public Land	Active AUMs
Bar Seven	61 Cattle	Bench	NA	05/01	06/30	27	67
		River	1 use	10/01	11/30		
			2 use				
			3 rest				

McAtee Bridge #10529

Grazing Management:

- Rest the South A pasture adjacent the Madison River until the next scheduled MW assessment. If at that time, the upland habitat meets the Standard, re-authorizing grazing would be considered.
- Designate the season of use in the North pasture as 09/01 to 10/31.
- Use the new unit (riparian pasture) in the North pasture for only two weeks every other year between 09/01 and 10/31.

Projects:

- Create an enclosure pasture by building approximately ½ mile of three-strand barbed wire fence around BLM administered land in the northwest corner of North pasture at T 8S R1W section 23 NW ¼ NW¼.

- Construct approximately 1¾ miles of three-strand barbed wire suspension fence along the county road south of the McAtee Bridge from the boundary of the State land to the cattle guard across the road at the entrance to the Ruby Creek camp ground.
- Install a cattle guard across right of way crossing South A pasture to a private residence.

Table 2.21: Proposed Authorized Use for McAtee Bridge allotment, Alternative C

Allotment	Pastures	Number/Kind	Begin Date	End Date	% Public Land	Active AUMs
McAtee Bridge	South B	15 Cattle	05/15	06/30	100	54
	North		09/01	10/31		

MVHP #10550

Administrative Actions:

- Renew ten year term grazing lease under current terms and conditions.

Projects:

- Build up to ¾ miles of new four-strand barbed wire fence and maintain/re-build approximately ½ mile of existing fences.
- Extend water pipeline from the Palisades Recreation facility well and pump water to a trough in upper bench pasture.

Table 2.22 Proposed Authorized Use for MVHP allotment, Alternative C

Allotment	Number/Kind	Begin Date	End Date	% Public Land	Active AUMs
MVHP	7 Cattle	06/10	10/20	100	31

North Morgan #20423

Grazing Management:

- Split the allotment into two pastures, Upriver and Downriver.
- Implement a two pasture spring-fall-rest-rotation grazing system.

Projects:

- Construct approximately ½ mile long three-strand barbed wire division fence making two pastures in T7S R1W section 33.

Table 2.23: Proposed Authorized Use for North Morgan allotment, Alternative C

Allotment	Number/Kind	Pastures	Year	Begin Date	End Date	% Public Land	Active AUMs
North Morgan	64 Cattle	Upriver	1	10/01	10/30	8	11
			2	Rest			
			3	05/01	05/31		
		Downriver	1	05/01	05/31		
			2	10/01	10/31		
			3	Rest			

Preacher Creek AMP#20404

Grazing Management:

- In addition to the terms and conditions under Alternative B the following would be included under Alternative C.
 - Rest either the Rattlesnake or Preacher Creek pastures each year.

- Rest either Canadian, Token and East pastures every year in a three year rest-rotation fall grazing treatment.

Projects:

- Same as Alternative B

Table 2.24: Proposed Authorized Use for Preacher Creek AMP allotment, Alternative C

Allotment	Number/Kind	Pastures	Year	Begin Date	End Date	% Public Land	Active AUMs
Preacher Creek	134 Cattle	Rattlesnake	1	06/25	07/31	29	124
			2	rest	rest		
		Preacher Cr.	1	rest	rest		
			2	06/25	07/31		
		Canadian	1	11/01	12/31		
			2	11/01	12/31		
			3	rest	rest		
		Token	1	11/01	12/31		
			2	rest	rest		
			3	11/01	12/31		
		East	1	rest	rest		
			2	11/01	12/31		
3	11/01		12/31				

Revenue Common AMP #20407

Grazing Management:

- In addition to the terms and conditions proposed under Alternative B, limit use in the Carmen pasture to 21 days.

Projects:

- Same as Alternative B

Table 2.25: Proposed Authorized Use for Revenue Common AMP allotment, Alternative C

Allotment	Number/Kind	Year	Pastures	Begin Date	End Date	% Public Land	Active AUMs
Revenue Common AMP	179 Cattle (two operators)	1	Carmen	rest	rest	42	305
			Upper Lamb	06/15	07/14		
			Lower Lamb	07/15	08/13		
			Upper Revenue	08/14	09/12		
			Lower Revenue	09/13	10/12		
			Carmen	09/13	10/03		
		2	Upper Lamb	rest	rest		
			Lower Lamb	08/14	09/12		
			Upper Revenue	07/15	08/13		
			Lower Revenue	06/15	07/14		
			Carmen	07/15	08/04		
			Upper Lamb	06/15	07/14		
		3	Lower Lamb	rest	rest		
			Upper Revenue	09/04	10/03		
			Lower Revenue	08/05	09/03		
			Carmen	08/14	09/03		
			Upper Lamb	09/04	10/03		
			Lower Lamb	06/15	07/14		
		4	Upper	rest	rest		

			Revenue				
			Lower Revenue	07/15	08/13		
		5	Carmen	06/15	07/05		
			Upper Lamb	07/06	08/04		
			Lower Lamb	08/05	09/03		
			Upper Revenue	09/04	10/03		
			Lower Revenue	rest	rest		

Sitz #00438

Grazing Management:

- Remove all permanent and temporary cattle management facilities from BLM administered lands (the perimeter fence would be maintained until rehabilitation process is complete).
- Rehabilitate the impacted area by seeding an appropriate native mix based on soil type and ecological site potential.
- Rest rehabilitated area for a minimum of three growing seasons after project completion. Cattle would not be authorized to graze until upland habitat is evaluated and determined to be in PFC.

Table 2.26: Proposed Authorized Use for Sitz allotment, Alternative C

Allotment	Number/Kind	Begin Date	End Date	% Public Land	Active AUMs
Sitz	2 Cattle	03/01	12/31	100	18

Storey Property

Administrative Actions:

- Classify the 990 acre Storey Property as unavailable to grazing.

Trail Creek C&H AMP #30401

Grazing Management:

- Proposed actions are the same as Alternative B.

Projects:

- Complete approximately ¼ mile of riparian juniper treatment along Spring Creek (reach 604), as described in section 2.3.3.
- Mechanically reduce juniper density at Trail Creek Spring and orient strategically to protect the spring source from ungulate trampling.

Wallace Peak AMP #10447

Administrative Actions:

- Remove the 489 acre Mill Pasture from the allotment.
- Designate the Mill Pasture a Custodial allotment.

Grazing Management:

- Use the Miller and North and South Taylor Fields in a three pasture rest-rotation. Period of use would be 30 days per pasture for a total of 60 days per season.

Table 2.27: Proposed Authorized Use for Wallace Peak AMP allotment, Alternative C

Allotment	Number/Kind	Year	Pastures	Begin Date	End Date	% Public Land	Active AUMs
Wallace Peak AMP	120 Cattle	1	Miller	07/05	08/03	20	66
			N. Taylor	08/04	09/02		
			S. Taylor	rest	rest		
		2	Miller	rest	rest		
			N. Taylor	07/05	08/03		
			S. Taylor	08/04	09/02		
		3	Miller	08/04	09/02		
			N. Taylor	rest	rest		
			S. Taylor	07/05	08/03		

Windy Pass AMP # 20385

Administrative Actions:

- Same as Alternative B.

Grazing Management:

- In addition to the terms and conditions proposed under Alternative B, the Gathering pasture would be rested every other year, during the trailing only season.

Projects:

- Same as Alternative B.

Table 2.28: Proposed Authorized Use for Windy Pass allotment, Alternative C

Allotment	Number/Kind	Pastures	Year	Begin Date	End Date	% Public Land	Active AUMs
Windy Pass	141 Cattle	Windy	1	07/01	07/14	79	55
			2 trailing	07/01	07/05		
		Gathering	1	09/14	09/23		
			2	rest	rest		

Forest and Woodland Treatments

Under Alternative C, five of the eight forests and woodland treatments are carried forward as proposed in Alternative B, one treatment unit is carried forward from Alternative B with a modified treatment type, and three additional treatment units are proposed. Additionally, whitebark and limber pine protection/enhancement would occur as described above in section 2.3.3.

Table 2.29 outlines the proposed units, objectives, treatment types and the affected allotments under Alternative C. Unit locations and boundaries are shown on Map 2-5, Appendix A.

Table 2.29: Forest and Woodland Treatment Units, Alternative C

Unit Name	Allotment	Acres	Objective(s)*	Treatment Type(s)
Willow 1	Willow Creek	138	Salvage dead/dying timber	Commercial harvest
Windy 3	Windy Pass AMP	341	Salvage dead/dying timber	Commercial harvest
Charcoal 1	Strawberry Ridge	129	Salvage dead/dying timber, reduce fuel loading adjacent to WUI	Permitted removal of wood products

Unit Name	Allotment	Acres	Objective(s)*	Treatment Type(s)
Strawberry 1	Strawberry Ridge	114	Salvage dead/dying timber, reduce fuel loading adjacent to WUI	Permitted removal of wood products
Cataract 1	Strawberry Ridge/Glen Kyle	132	Salvage dead/dying timber	Permitted removal of wood products
Aspen Creek	Aspen Creek	350	Salvage dead/dying timber, reduce fuel loading adjacent to WUI, reduce conifer expansion into meadows	Comprehensive commercial and non-commercial treatment
Preacher 1	Preacher Creek AMP	59	Salvage dead/dying timber	Commercial harvest
Preacher 2	Preacher Creek AMP	121	Salvage dead/dying timber	Commercial harvest
Preacher 3	Preacher Creek AMP/Wallace Peak AMP	1785	Enhance aspen, reduce conifer expansion	Non-commercial mechanical/prescribed fire

Description of Forest and Woodland Treatment Types

Also see section 2.3.3, Features Common to Alternatives B and C for additional design features.

Commercial Harvest - Up to 659 acres of commercial harvest treatment within four treatment units is proposed under Alternative C. In stands composed primarily of lodgepole pine, the silvicultural prescription would focus on the salvage harvest of dead and dying trees, removing up to 80% of older dead trees, and up to 90% of recent dead trees. Up to 100% of green trees with evidence of successful beetle attack would also be harvested and removed. Where scattered healthy Douglas-fir trees occur in stands composed primarily of lodgepole pine, these trees would be left.

In mixed conifer and Douglas-fir stands, green trees would be thinned across all diameters, with focus on leaving those with healthy crowns and minimal budworm damage, to create a residual stand with an average basal area of 80ft²/acre with a range from 20-100ft²/acre. Dead and dying trees would be salvage harvested as described above.

Where viable aspen stands exist (defined as five or more live stems greater than 1" DBH), all merchantable size conifers within one aspen tree height of the aspen stand would be cut. Where possible, non-merchantable conifers within the same areas would be cut and left on-site as a browse barrier.

Healthy spruce and five needle pines (limber and/or whitebark pine) would not be cut unless they were deemed a safety hazard or were within aspen treatment areas. At a minimum, an average of two to five existing snags or green recruitment snags would be left per acre within treatment units. Priority of snags to be left would be given to those with evidence of wildlife use or with wildlife-use characteristics such as forks, broken tops, or large horizontal branches. Scattered patches of uncut timber would be left within treatment units to provide hiding cover and break up sighting distances.

For the Willow 1 unit, wood products would be cable yarded up to the existing road on the ridge. No new road construction is proposed for this unit. For the Windy 3 unit, up to 1.2 miles of new temporary road would be constructed, and one temporary stream crossing may be needed on a

tributary to Antelope Creek (reach #664). Tractor and/or cable yarding would be used to harvest this unit. Proposed yarding methods and road construction for the Preacher 1 and Preacher 2 units would be the same as described under Alternative B.

Permitted removal of wood products – Making permits available to the general public for the harvest and removal of wood products on up to 375 acres in three treatment units is proposed in Alternative C. Proposed design features for permitted removal of wood products would be the same as described above under Alternative B. The stream crossing proposed to access the Cataract 1 unit would be installed as described under Alternative B. No other stream crossings are required for permitted removal areas in Alternative C.

Non-commercial mechanical/prescribed fire – Up to 1785 acres of non-commercial mechanical/prescribed fire treatment in the Preacher 3 unit is proposed under Alternative C. Treatment would focus on areas where conifers have most noticeably expanded into sagebrush/grassland compared to historic aerial photographs. The primary goal would be to kill/remove 60% or more of conifers less than 30 feet tall. Treatment methods would be a combination of cutting (lop and scatter) and/or prescribed fire. Prescribed burn unit boundaries would be based on topographic features such as ridges and drainages, and man-made features such as trails and roads. When using prescribed fire to reduce conifer encroachment into sagebrush habitat, an emphasis would be placed on maintaining 50% or more of the mature sagebrush canopy cover on a drainage (HUC 6) basis.

Comprehensive commercial and non-commercial treatment – Up to 350 acres of comprehensive commercial and non-commercial treatment in the Aspen Creek unit is proposed under Alternative C. Treatment would focus on promoting/maintaining existing aspen stands, and harvesting areas of dead and dying timber. Where viable aspen stands exist (defined as five or more live stems greater than 1” DBH), live conifers within one aspen tree height of the aspen stand would be cut. The disposal of slash produced by non-commercial treatments would be the same as described in Alternative B.

Commercial timber harvest would primarily occur in the lodgepole dominated stands at the south half of the treatment unit, but may also be used to remove merchantable size conifers from within and around aspen stands throughout the treatment unit. Commercial harvest would remove up to 100% of overstory lodgepole pine trees. Slash produced by commercial harvest would be made available as woody biomass, burned at landings, or broadcast burned. Outside of aspen treatments areas, scattered sapling size Douglas-fir, subalpine fir, spruce, and lodgepole pine trees would be left. On-the-ground layout would be coordinated with the BLM Wildlife Biologist to determine if and where additional patches of trees may be left. Up to 1.0 mile of new temporary road would be required to implement the commercial harvest treatment in this unit.

Noxious and Invasive Species

In addition to the aerial and ground herbicide application treatments and biological control insects described under Alternative B above, the following actions would be completed under Alternative C within the Flying D and Shirley Allotments as well as the public land parcels within the Red Bluff Experiment Station.

In cooperation with private landowners, sheep or goats would be used as biological control agents to reduce the size and density of leafy spurge infestations. These treatments would include bringing the sheep or goats in during the vegetative to flowering stage and graze to remove 95% of the top growth. A possible second treatment may be needed to suppress regrowth and flowering depending on seasonal moisture. This would be used in conjunction with herbicide and insect biocontrol to reduce the competitive advantage of the leafy spurge on the Flying D and Shirley allotments and the un-allotted parcels managed by the Red Bluff agricultural research station.

Use herbicide, restoration (reseeding) and possibly temporary fencing to control the cheat grass infestation on the Wall Creek Game Range allotment. Herbicide treatments would be done in late fall or early spring. Restoration work would be done either a few weeks following treatment or the following fall depending on timing of the treatment. Temporary fencing may be used to keep elk and livestock out of the area until the reseeded native grasses have established.

2.4 Summary Comparison of Alternative Actions

Table 2.30: Comparison of Proposed Livestock Grazing or Administrative Alternatives

Aspen Creek #10540	Alternative A			Alternative B			Alternative C
Season of Use	05/15 – 11/14			07/01 -07/31			07/01 -07/31
Livestock Number and Kind	11 Cattle			96 Cattle			96 Cattle
Active BLM AUMs	67			67			67
Grazing System	Custodial			Seasonal (21 days max.)			Rest every third year
Projects	None			<ol style="list-style-type: none"> 1. Develop spring on private and pipe water to trough on BLM land for livestock. 2. Cut dead trees adjacent to Aspen Creek tributary and orient across the channel. 3. Buck up and/or re-orient downfall on banks adjacent reach 2035 to allow the cattle passage further away from the channel and eliminate trailing within the stream. 			Same as Alternative B
Administrative Action	None			<ol style="list-style-type: none"> 1. Remove the North and Middle Pastures from allotment. 2. Change the boundaries of the Aspen Creek allotment to include only the South pasture. 3. Create Horse Creek custodial allotment from North pasture. 4. Adjust percent public land to 70%. 			<ol style="list-style-type: none"> 1. Remove the North and Middle Pastures from allotment. 2. Change the boundaries of the Aspen Creek allotment to include only the South pasture. 3. Designate BLM administered land in the North pasture as unavailable for grazing. 4. Adjust percent public land to 70%.
Axlotl Lakes #20485	Alternative A			Alternative B			Alternative C
Season of Use	Operator #2500116	Blue Lake	06/20-11/20	Operator #2500116	Blue Lake	No grazing	Same as Alternative B
		Monument	06/20-11/18		Monument	06/20-11/18	

		Gustin AB	07/01-10-01		Gustin AB	07/15-10/15	
	Operator #2505710	06/26-09/15		Operator #2505710	Same as Alternative A		
Livestock Number and Kind	Operator #2500116	407 Cattle		Operator #2500116	404		
	Operator #2505710	135 Cattle		Operator #2505710	Same as Alternative A		
Active BLM AUMs	Operator #2500116	406 Cattle		Operator #2500116	391		
	Operator #2505710	357 Cattle		Operator #2505710	Same as Alternative A		
Grazing System	Operator #2500116	Seasonal		No change			
	Operator #2505710	Deferred rotation					
Projects	None			1. Abandon and clean up the spring development at the Axolotl Lakes Spring. 2. Construct an enclosure around the undeveloped spring in the Upper Combs pasture.			
Administrative Action	None			1. Change season of use in the Gustin AB pasture to 07/15-10/15 (currently 07/01-10/01). 2. Make the Blue Lake pasture unavailable to grazing, and reduce authorized AUM by 15 for Operator #2500116.			
Bar Seven #10457	Alternative A			Alternative B			Alternative C
Season of Use	05/01 – 02/22			River pasture	10/01– 12/31	River pasture	Year
				Bench pasture	05/01 -07/01		Bench pasture
		2	Rest				
						3	10/01– 12/31
							05/01 - 07/01
Livestock Number and Kind	50 Cattle			68 Cattle			68 Cattle
Active BLM AUMs	345			344			344
Grazing System	Custodial			Deferred-Rotation			Rest-Rotation
Projects	None			1. Construct two mile long 3-strand high tensile electric fence on BLM boundary in River pasture. 2. Authorize Bar Seven Spring development in T7S R1W section 31 in the Bench pasture.			Same as Alternative B
Elmer #20394	Alternative A			Alternative B			Alternative C
Season of Use	07/01 – 10/08			07/01 -10/01			Same as Alternative B
Livestock Number and Kind	21 Cattle			23 Cattle			
	2 Horses						

Active BLM AUMs	76		76				
Grazing System	Custodial		Custodial				
Projects	None		1. Corridor fence (0.75 mi.) Hot Springs Creek tributary. 2. Clean up old mining debris. 3. Replace the culvert in creek that runs under the road. 4. Build a hardened water gap in enclosure fence.				
Jourdain Creek #20410	Alternative A		Alternative B		Alternative C		
Season of Use	06/06-10/15		06/06-10/15		Same as Alternative B		
Livestock Number and Kind	5 Cattle		5 Cattle				
Active BLM AUMs	20		20				
Grazing System	Seasonal		Seasonal				
Projects	None		1 Complete riparian juniper treatment along Trail Creek, reach # 606.				
Ledyard-McGuiness #20416	Alternative A		Alternative B		Alternative C		
Season of Use	06/16-09/14		Year 1	05/11-06/14	Same as Alternative B		
			Year 2	10/01-11/13			
Livestock Number and Kind	25 cattle		25 cattle				
Active BLM AUMs	75		75				
Grazing System	Seasonal		Seasonal				
Projects	None		None				
Administrative Actions	None		None				
McAtee Bridge #10529	Alternative A		Alternative B		Alternative C		
Season of Use	North pasture	09/01-10/31	North pasture	09/01-10/31	North pasture	Year 1	09/01-10/31
						Year 2	Rest
	South pasture	04/15-06/30	South A	Unavailable for grazing	South A		Extended rest
			South B	05/01-06/30	South B		05/01-06/30
Livestock Number and Kind	13 Cattle		15 Cattle		15 cattle		
Active BLM AUMs	92		54		54		
Grazing System	Custodial		Custodial		Deferred-Rotation		

Projects	None	1. Construct 1¾ miles of 3-strand bard wire suspension fence around the South A pasture. 2. Install one cattle guard across right-of-way to private residence in the South A pasture.	1. Construct 1¾ miles of 3-strand barb wire suspension fence to isolate South A pasture. 2. Install one cattle guard across right-of-way to private residence in the South A pasture. 3. Construct ¾ mile of 3-strand barbed wire fence on public land boundary in the northwest corner of the North pasture.
Administrative Action	None	1. Remove 186 acres of the South pasture from allotment and classify as unavailable. 2. Suspend 38 AUMs from the term grazing lease.	None
MVHP #10550	Alternative A	Alternative B	Alternative C
Season of Use	06/10 – 10/20	None	06/10 – 10/20
Livestock Number and Kind	7 Cattle	None	7 Cattle
Active BLM AUMs	30	None	30
Grazing System	Trailing	None	Trailing
Projects	None	1. Remove approximately 1½ miles of unnecessary barbed wire fence.	1. Build up to ¾ miles of new 4-strand barbed wire fence. 2. Extend water pipeline from the Palisades Recreation facility well and pump water to a trough in upper bench pasture.
Administrative Actions	None	1. Classify as unavailable for grazing. Do not renew the grazing lease for the MVHP.	1. Renew the grazing lease for the MVHP.
North Morgan #20423	Alternative A	Alternative B	Alternative C
Season of Use	05/01 – 05/31	Year 1 Upriver pasture 05/01-05/31	Year 1 Upriver pasture 05/01-06/30
		Downriver pasture 10/01-10/31	Downriver pasture 10/01-10/31
		Year 2 Upriver pasture 10/01-10/31	Year 2 Upriver pasture 10/01-10/31
		Downriver pasture 05/01-05/31	Downriver pasture Rest
			Year 3 Upriver pasture Rest
			Downriver pasture 05/01-05/31
Livestock Number and Kind	11 Cattle	6 Cattle	11 Cattle
Active BLM AUMs	11	11	11
Grazing System	Custodial	Deferred rotation (both pastures used each year)	Rest-Rotation
Projects	None	1. Build ½ mile long 3-strand division fence.	Same as Alternative B
Preacher Creek AMP #20404	Alternative A	Alternative B	Alternative C

Season of Use	06/25 - 11/01	Rattlesnake & Preacher Creek pastures	06/15-07/31 or, 09/01-10/15	Rattlesnake and Preacher Creek pastures	Rest one pasture every other year
		Canadian, Token and East pastures	11/01-12/31	Canadian, Token and East pastures	Rest one of three pastures every year.
Livestock Number and Kind	100 Cattle	115 Cattle		115 Cattle	
Active BLM AUMs	124	124		124	
Grazing System	Deferred Rotation	Rest Rotation		Rest Rotation	
Projects	None	1. Build up to 1½ miles of 3-strand barbed wire, or high tensile electric, division fences to create the Rattlesnake and Preacher Creek pastures.		Same as Alternative B	
Revenue Common AMP #20407	Alternative A	Alternative B		Alternative C	
Season of Use	06/01 – 10/30	06/15 – 10/15		06/15 – 10/15	
Livestock Number and Kind	162	162		162	
Active BLM AUMs	305	279		279	
Grazing System	Deferred-Rotation	Rest-Rotation		Rest-Rotation (21 day limit in Carmen pasture)	
Projects	None	1. Protect Upper Revenue Spring and spring brook with an enclosure fence. 2. If feasible, provide an off stream watering trough adjacent reaches 626 or 671 in the Carmen pasture. 3. Abandon project and remove headbox on Lower Revenue Spring.		Same as Alternative B	
Shirley #10436	Alternative A	Alternative B		Alternative C	
Season of Use	11/15 – 01/14	11/ 15 – 02/28		Same as Alternative B	
Livestock Number and Kind	32 Cattle	12 Horses			
Active BLM AUMs	64	63			
Grazing System	Custodial	Custodial			
Projects	None	1. Enlarge the enclosure around Montana 32 Spring and install a new trough.			
Administrative Action	None	1. Change the kind of livestock to horses. 2. Reduce number of livestock to 12. 3. Change season of use. 4. Calculate AUMs consumed at 1.5 AUMs per AU to account for horses.			

Sitz Allotment #00438	Alternative A		Alternative B		Alternative C
Season of Use	03/01 – 12/31		03/01 – 12/31		03/01 – 12/31
Livestock Number and Kind	2 Cattle		2 Cattle		2 Cattle
Active BLM AUMs	20		20		20
Grazing System	Custodial		Custodial		Custodial
Projects	None		None		None
Administrative Action	None		1. Include the Sitz allotment in an assembled land exchange when the opportunity arises. 2. Authorize livestock management facilities under provisions in Section 4 of the Taylor Grazing Act and 43 CFR 4120.3.		1. Require lessee to remove all cattle management facilities from BLM administered lands. 2. Rehabilitate impacted area with native seed mix based on soil type and ecological site potential. 3. Rest pasture for a minimum 3 years and re-evaluate upland functioning condition.
Storey Property	Alternative A		Alternative B		Alternative C
Season of Use	None		06/15 – 10/15		None
Livestock Number and Kind	None		Cattle		None
Active BLM AUMs	Unleased		141		None
Grazing System	None		1. Authorize grazing use under temporary non-renewable authorization. 2. Designate the grazing season from 06/01 to 10/30, but limit use to no more than 30 days and 141 AUMs during any given year. 3. Authorize utilization for no more than two consecutive years.		None
Projects	None		1. Construct 1¼ miles of 3-strand barbed wire fence on north boundary line. 2. Install two cattle guards on boat launch access road. 3. Enclose boat launch and recreational area with jack and rail fence.		None
Administrative Action	None		1. Designate the Storey Property a Resource Reserve allotment.		1. Designate the Storey Property as unavailable to livestock grazing.
Strawberry Ridge #10421	Alternative A		Alternative B		Alternative C
Season of Use	Operator #2505643	07/01-09/14	Operator #2505643	07/01-09/14	Same as Alternative B
	Operator #2505687	07/01-09/14	Operator #2505687	07/01-09/14	
Livestock Number and Kind	Operator #2505643	118 Cattle	Operator #2505643	101 Cattle	
	Operator #2505687	187 Cattle	Operator #2505687	159 Cattle	
Active BLM AUMs	Operator #2505643	106	Operator #2505643	98	
	Operator #2505687	167	Operator #2505687	155	

Grazing System	Operator #2505643	Deferred rotation	Operator #2505643	Deferred rotation	
	Operator #2505687	Deferred rotation	Operator #2505687	Deferred rotation	
Projects	None		1. Authorize the use of up to ¼ mile of temporary electric fence on ridge between Cataract and Pony Creek for cattle management. 2. Build a hardened crossing across Cataract Creek to access firewood cutting unit.		
Administrative Action	None		1. Remove 520 acres of BLM administered land, state and private land from the Strawberry Ridge allotment and add it to the Windy Pass allotment. 2. Adjust percentage of public land to 39%. 3. Reduce AUMs on public land to 285. 4. Reduce total number of authorized cattle to 260.		
Trail Creek C&H AMP #30401	Alternative A		Alternative B		Alternative C
Season of Use	Spring	07/01-07/09	Spring	07/01-07/09	Same as Alternative B
	Fall	07/27-10/05	Fall	07/27-10/05	
Livestock Number and Kind	220 Cattle		220 Cattle		
Active BLM AUMs	41		41		
Grazing System	Rest Rotation/trailing		Rest Rotation/trailing		
Projects	None		None		
Administrative Action	None		1. Add riding term and condition to grazing lease.		1. Add riding term and condition to grazing lease.
Wallace Peak AMP #10447	Alternative A		Alternative B		Alternative C
Season of Use	07/01 – 09/30		07/01 – 09/28		07/05 – 09/02
Livestock Number and Kind	166 Cattle		110 Cattle		110 Cattle
Active BLM AUMs	65		65		65
Grazing System	Deferred Rotation		1. Four Pasture Rest-Rotation 2. Change the number of authorized cattle from the current level of 166 to 110. 3. Limit use period to 30 days in each of the three grazed pastures for a total of 90 days per season.		1. Three Pasture Rest-Rotation 2. Change the number of authorized cattle from the current level of 166 to 110. 3. Use the Miller and North and South Taylor Fields in a three pasture rest-rotation. 4. Period of use would be 30 days per pasture for a total of 60 days per season.

Projects	None	1. Construct ¼ mile drift fence, dividing Taylor pasture into two grazing units. 2. Develop livestock watering facility on State section (T3S R2W section 23). 3. Abandoned and clean up Wallace Spring.	Same as Alternative B		
Administrative Action	None	1. Remove approximately 300 acres of private and state land in the Mill pasture from the allotment.	1. Remove the entire Mill pasture from the Wallace Peak allotment and classify it a Custodial allotment.		
Windy Pass AMP #20385	Alternative A	Alternative B		Alternative C	
Season of Use	09/01-09/14	Year 1	07/01–07/15	Year 1	07/01–07/15
		Year 2 trailing only	07/01-07/15 (5 days max)	Year 2 trailing only	07/01-07/15 (5 days max)
		Gathering Pasture	09/01-09/10	Gathering Pasture	Rest every other year
Livestock Number and Kind	200 Cattle	142 Cattle		142 Cattle	
Active BLM AUMs	46	55		55	
Grazing System	Seasonal	Rest Rotation		Rest Rotation	
Projects	None	1. Construct up to ½ mile of 4-strand barbed wire fence. 2. Install headbox and trough in Gathering pasture. 3. Cut a few Douglas fir trees and orient around the spring source and wetlands at the head of reach 666.	Same as Alternative B		
Administrative Action	None	1. Add 520 acres of BLM administered land, State and private land taken from the Strawberry Ridge allotment. 2. Change the northeast boundary corner of the allotment removing approximately 424 acres of private land from the allotment. 3. Adjust the percent public land in the allotment to 78%. 4. Increase AUMs to 55.	Same as Alternative B		

Table 2.31: Comparison of Forest and Woodland Treatments by Alternative

	Alternative A	Alternative B	Alternative C
Forest and Woodland Treatments			
Commercial Harvest	0	180	659
Permitted Wood Removal	0	569	375
Non-commercial Mechanical/Prescribed Fire	0	350	1785
Comprehensive Commercial and Non-commercial Treatment	0	0	350

Total acres	0	1099	3169
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Table 2.32: Comparison Travel Management Actions by Alternative

Travel Management (Designated Route changes, in miles)			
	Alternative A	Alternative B	Alternative C
Change to Open	None	4.1	4.1
Change to Closed	None	2.2	2.2
Change to Seasonally Open (from open yearlong)	0	2.5	2.5

Table 2.33 Comparison of Noxious and Invasive Species Treatments by Alternative

Weed Treatments (Acres)			
	Alternative A	Alternative B	Alternative C
Proposed ground treatments	125	125	325
Proposed aerial treatments	200	1000	1000
Bio-Control (additional insects)	25	40	40
Bio-Control (sheep and/or goats)	300	300	700

Chapter 3

3.0 Affected Environment

This chapter describes the existing condition of specific environmental components that may be affected by the proposed action. The description of the affected environment is related to the specific issues and resource concerns identified in Chapter 1, but also encompasses the wider landscape of the MW. This chapter is a summary of the baseline environment. A more detailed and comprehensive description of the current conditions in the watershed are provided in the MW Assessment Report (December 2009) and is available for review at the Dillon Field Office or online at http://www.blm.gov/mt/st/en/fo/dillon_field_office.html.

3.1 General Setting

Topography within the MW varies from grass covered terraces and benches adjacent to the Madison River, to high alpine forested slopes in the Tobacco Root, Madison and Gravelly mountains. Elevations range from approximately 4,400 feet above sea level along the lower Madison, to 11,300 feet at Hilgard Peak in the Madison Mountain range.

Average annual precipitation within the watershed varies from about 12 inches in the lower elevations to 40 inches on the high mountain slopes in the Beaverhead-Deerlodge National Forest in the Madison Mountain range.

The mountain ranges were formed by complex faulting and uplifting. The consequent valleys filled with sediment transported by streams draining the uplifted terrain. The major streams occupying the basin bottoms were overloaded and could not carry sediment away as fast as it was being provided. In addition, volcanic ash and breccia were added to the excessive sediment loads. The resulting basin-fill material is a complex mixture of debris from erosion and volcanic material. Alluvium that blankets the flood plains and the terraces adjacent the streams varies from fine-textured clay, silt and sand to more coarse gravel and cobble.

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. A wide variety of vegetation is found from wetland and riparian obligate species, dependent on water and moist soils, to sagebrush and grass dominated plant communities that thrive on dryer upland sites. Forested habitats dominate the higher elevations. The watershed's varied landscape and vegetation provides an array of habitats and structural niches sustaining an abundant diversity of wildlife.

3.2 Description of Affected Resources/Issues

3.2.1 Issue # 1: Riparian, Wetland, Aquatic Habitat and Associated Species

The rivers and streams in MW drain nearly one million acres of BLM, Forest Service, State and private land. The Madison River is the dominant hydrologic feature. It flows into the MW just below Quake Lake, runs north into Ennis Lake, through the Bear Trap canyon and out of the

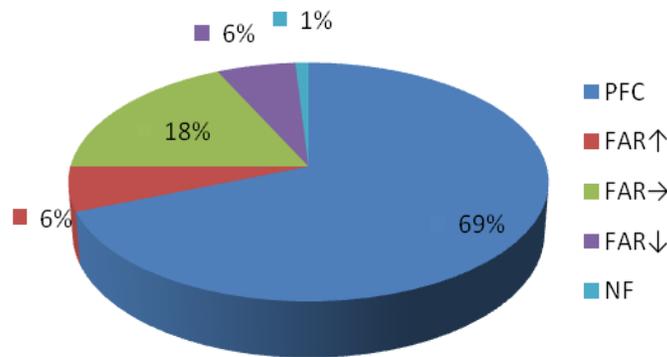
watershed at Black's Ford. Numerous springs and small mountain tributaries flow out of the high country, merging into dozens of larger stream systems which eventually empty into the Madison River.

Riverine and Palustrine wetland systems are frequently found on BLM administered lands within the watershed. The most extensive wetlands in the watershed are located in the Axolotl Lakes area. Riparian and wetland communities around springs, seeps and pothole ponds are important contributors to habitat diversity as well as valuable water sources. Hydric soils are a small component of the landscape, but play an important role in ecological processes.

The BLM has management responsibility on lands adjacent to at least one and often both banks along 21 miles of the Madison River. Water flows in the Madison are regulated by two dams, as well as Quake Lake. Due to flow regulation, much of the channel is disconnected from its floodplain, the water table has dropped, and support of riparian or wetland vegetation is reduced. In addition to the Madison, there are approximately 40 stream miles flowing through BLM administered land within the assessment area.

Of the 72 stream reaches assessed, 50 reaches, totaling 26.9 miles, were rated PFC. Five reaches, totaling 2.2 miles, were rated FAR with an upward trend. Twelve reaches, totaling 6.9 miles, were rated FAR with a static or no apparent trend. Four reaches, totaling 2.5 miles, were rated FAR with a downward trend. One reach, totaling 0.4 miles, was rated NF.

Figure 3.1: The percentage of the total stream miles in each functional class



There are riparian resources in 29 of 39 allotments. Riparian and wetland resources in 22 of the allotments are PFC or FAR with an upward trend. The riparian resources in all the un-allotted and un-leased tracts which includes the Bear Trap Wilderness are also either PFC or FAR with an upward trend.

Authorized livestock grazing is a causal factor in the Riparian Standard not being met in seven allotments: Aspen Creek, Elmer, Michel, Preacher Creek, Revenue Common AMP, Wallace Peak AMP and Windy Pass AMP. Although Strawberry Ridge, Trail Creek AMP, and Jourdain Creek allotments met the Riparian Health Standard, site specific riparian concerns were noted in these allotments.

A brief description of impacts and concerns for the reaches within the seven allotments that did not meet BLM's Riparian Health Standard and the reaches that had noted resource concerns in three additional allotments are discussed below. Fifty-five stream reaches assessed within the MW met BLM's Riparian Health Standard and are not discussed here. For more information on specific stream reaches, please refer to the Madison Watershed Assessment Report.

Aspen Creek #10540

Aspen Creek - Reach 600: Concerns included over-widening, a reduction in ability to transport its sediment, bank shearing, and a reduction in sedge.

North Fork of Aspen Creek - Reach 2035: Concerns included an over-widened channel and a reduction in the stream's ability to move its sediment as evidenced by braiding and aggradation. Trailing, excessive browsing of willows, lack of willow regeneration, and a reduction in sedge and aspen were also observed.

Elmer #20394

Tributary to Hot Springs Creek - Reach 2036: Concerns included alteration of habitat by historic mining, channel over-widening, debris (materials and machinery) in the stream, an undersized and dysfunctional culvert under the county road bisecting the reach, non-native vegetation (golden willows), and invasive weeds (leafy spurge and houndstongue). The combination of culvert upstream at the county road and road fill several hundred feet downstream has caused ponding and an accumulation of sediments in the area between these two features. There is no relief structure associated with the road fill and, as a result, sheet and rill erosion are occurring during high water events. The construction of an unauthorized secondary road across the stream has clogged the channel with road base material and created a shallow warm pool behind the obstruction. Although the water is flowing over the road, this man made obstacle is negatively affecting the water temperature, width depth ratio and sinuosity of the downstream portion of the reach.

Michel #20417

Bradley Creek - Reach 607: Concerns included waste material and debris from the Montana Boy Mine and other trash more recently dumped into the stream channel.

Preacher Creek #20404

Canadian Creek - Reach 611: Concerns included channel over-widening, bank trampling, excessive browsing on willows and decreased willow recruitment and regeneration.

Preacher Creek - Reach 658: Concerns included bank trampling, reduction in the deep rooted bank stabilizing sedge community, increases in Kentucky bluegrass in the riparian area, channel over-widening, and a reduction in woody species, particularly willows.

Revenue Common AMP #20407

South Fork of Hot Springs Creek - Reach 671: Concerns included bank degradation, channel over-widening, recreational vehicle (ATV) impacts along portions of the reach, the presence of brook grass, timothy and Kentucky bluegrass along the channel's greenline and the lack of middle age class willows.

South Fork of Hot Springs Creek - Reach 626: Concerns are similar to 671, but also include loss of Bebb willows due to shading and Douglas-fir expansion. Houndstongue and Canada thistle were noted along these reaches. Impacts from ATV traffic adjacent the stream has resulted in channel over-widening and aggradation. The stream's capacity to maintain its geometry or process its sediment has been reduced.

Lower Revenue Spring and Reach 2043: Concerns included livestock trailing, bank disturbances, and sedimentation. Canada thistle and houndstongue were also noted in and adjacent to the riparian area.

Wallace Peak AMP #10447

Canadian Creek - Reach 610: Concerns included trailing, bank shearing, and over-widening of the stream channel resulting in a reduction in sediment transport efficiency and altered channel geometry.

North Fork Hot Springs Creek - Reaches 625, 670 and Middle Fork Hot Springs Creek – Reach 623: Concerns included livestock trailing, which has resulted in some bank shearing and channel over-widening.

Windy Pass AMP #20385

Antelope Creek - Reach 664: Concerns include livestock trails, pugging and hummocking, and the lack of deep rooted vegetative species. The channel is also over-widened and aggrading. The capacity for the stream to move its sediment and maintain channel geometry is reduced. The springs and seeps feeding reach 665 are being impacted by livestock trampling.

Strawberry Ridge #10421

The lower portion of Antelope Creek, reach 666, is a continuation of reach 665 in Windy Pass allotment. It is rated as FAR static due to livestock trailing, channel over-widening and the channel's reduced capability to transport sediment.

Jourdain Creek #20410

The Jourdain Creek allotment met the riparian health standard, but site specific concerns were noted on about ½ mile of lower Trail Creek (reach 606). Increasing juniper cover is encroaching into the deciduous riparian community. This conversion is reducing bank stability and the herbaceous species understory in the riparian area.

Trail Creek C&H AMP #30401

Overall the Trail Creek AMP allotment met the riparian health standard. Approximately ¼ mile of Spring Creek (reach 604), roughly one half the stream's total length, was rated as FAR with a downward trend. The downward trend is influenced by increasing juniper cover adversely affecting the deciduous riparian habitat. Livestock trailing is also impacting a short portion of the reach. The channel is over-widened and its capacity to move sediment and maintain its channel is reduced. Some channel braiding was observed which indicated the channel is aggrading.

Developed Springs

The Axolotl Lakes Spring in the Axolotl Lakes allotment has an undersized spring enclosure requiring maintenance. Trampling by ungulates and ground hummocking is occurring outside the enclosure.

The Lower Revenue Spring in Revenue Common AMP allotment is being impacted by ungulate trampling, resulting in ground hummocking. Although the spring is located on BLM administered land the nearby trough is on private land and is currently non-functional. There is no spring enclosure associated with this development.

The Montana 32 Spring is located in the Shirley allotment. There is an enclosure that is in fair condition, but is undersized. Below the spring is a small stock pond. There is evidence of recent wildlife and horse use at the pond. There is a very dense infestation of spotted knapweed adjacent to and below the pond.

Wallace Spring in the Wallace Peak allotment is dry and dysfunctional. The habitat at this spring included aspen and willow. The aspen community is being heavily browsed by wildlife and domesticated ungulates, which is reducing individual recruitment and stand regeneration.

During the assessment process the IDT assessed an undeveloped spring in the Axolotl Lakes allotment which is being impacted by wild and domestic ungulates. In addition, two undocumented developed springs were noted. One is located in the Bar Seven allotment (T7S, R1W, S31, NESW) and another on un-allotted BLM public land in the SE¹/₄ SE ¹/₄ of Section 18 T4S, R1E.

Wildlife resources associated with riparian wetland habitat seasonally or year-round include, but are not limited to elk, mule deer, white-tailed deer, beaver, moose, raptors, migratory birds, and sage grouse. Wildlife prefers this habitat because it provides green vegetation later into the summer and fall and many species of migratory birds use riparian habitat for nesting. Existing wildlife uses are discussed further in the MW Assessment report beginning on page 34.

Within the MW there are 11 perennial streams and four lakes on BLM administered land that support cold water fisheries. Common sport fish species in the area are brook trout, Yellowstone cutthroat trout, rainbow trout, rainbow x cutthroat hybrids and mountain whitefish. Non-native species were introduced into the area in the late 1800's up to the mid 1900's. Subsequently, populations of native cutthroat began to decline. Today, rainbow trout and hybrid cutthroat trout are commonly found in the lower to middle reaches of several streams. Eastern brook trout are common in the upper reaches of several streams.

Two lakes in the Axolotl chain support neotonic tiger salamanders commonly called axolotls. Historically, "axolotls" may have occurred in all of the natural lakes in the Axolotl area. Today they are only found in Blue Lake and Grassy Lake.

Streams considered to be fisheries on public lands administered by the BLM within the assessment area were all found to be in PFC condition. Some minor site specific impacts were noted at some locations, but were not at a level that they would be expected to have any

appreciable impacts to fishery habitat. However, many of the streams that were found to be in less than PFC condition are tributaries to streams that do support cold water fisheries.

3.2.2 Issue #2: Upland Habitat and Associated Species

Uplands are defined as land at a higher elevation than the alluvial plain or low stream terrace; all lands outside the riparian-wetland and aquatic zones (USDI 1996). For the purpose of the BLM's analysis, grassland communities and sagebrush steppe are considered uplands. Fifty six percent of the BLM administered land within the MW boundary is classified as either grasslands (45%) or sagebrush mountain shrub (11%). Forest and woodland communities are discussed separately below under Issue #3, Forest and Woodland Habitat.

The Madison County Soil Survey shows seven different soil complexes located in the MW assessment area. They vary across the diverse topography from the nearly level to gently sloping flood plains adjacent the Madison River to the steep rocky slopes of the mountain ranges. In the uplands the soils are well drained, vary from shallow to deep, and coarse fragment composition range from silty and/or sandy to gravelly material.

During an average water year the potential production of total vegetative biomass varies widely in the assessment area based on soils, elevation, aspect and precipitation. The shallow to gravelly soils located on the flood plains adjacent the Madison River only produce about 1,000 pounds per acre while the thin silty soils located in the mountains west of Pony can average about 2,200 pounds per acre. For more information on soils in the MW, refer to the Madison County Soil Survey.

As is the case across all landscapes, the upland plant composition in the MW is changing as the result of ecological succession. The natural progression towards a climax plant community is inevitable without disturbance. The spread of primarily Douglas-fir and Rocky Mountain juniper can be attributed, in part, to the reduced frequency of wildfire which has changed the dominant plant species and habitat types on some of the BLM administered lands in the MW.

The lower elevations on the river terraces and benches in the Madison Valley are dominated by grass and grass-like species. Cool season grasses on these ecological sites include bluebunch wheatgrass, Idaho fescue, prairie Junegrass, needle-and-thread grass, western wheatgrass and Indian ricegrass. Natural Resource Conservation Service (NRCS) ecological site descriptions specify that grass species should comprise 55-80% of total cover depending on relative site condition. Woody species on these sites frequently include mountain big sagebrush, skunkbush sumac, horsebrush and a couple of common rabbitbrush species. NRCS site descriptions explain that if any of these shrubs account for greater than 5% canopy cover, it usually indicates the site has been subject to some kind of past disturbance.

Much of the BLM administered rangelands in the MW are mid level (elevation) ecological sites in the vicinity of Norris and McAllister and on the upper benches and foothills in the Madison valley. Soils vary from sandy to gravelly and the annual average precipitation ranges from 10 to 19 inches. Plant communities and habitat types are primarily grasslands and sagebrush/grassland steppe. In climax seral state, composition by weight of annual production on these ecological sites is between 70 and 85% composition of grasses and grass-like species. Shrubs including

sagebrush, rabbitbrush, antelope bitterbrush, mock orange, and snowberry account for between 5 and 15% of the annual production and forbs such as lupine and yarrow the remainder.

Several allotments in the MW are located on high elevation mountainous terrain in the Tobacco Roots, Gravelly, and Madison ranges. Primary upland habitat is limited to open parks and relatively narrow high valleys and drainages adjacent to small tributaries. The relative dominance of bluebunch wheatgrass and Idaho fescue may be reduced as other cool season grasses such as Columbia needlegrass, mountain brome and basin wildrye are present. Increased production of forbs and shrubs are also a common characteristic of these higher elevation ecological sites.

The uplands within 33 of the 39 grazing allotments, approximately 90% of the total allotted BLM administered acres, are PFC or FAR with an upward trend. Further, all the uplands in the un-allotted and un-leased tracts, approximately 7,089 acres (including 4,473 acres in the Bear Trap Wilderness), are in PFC. The uplands in six grazing allotments were rated FAR with a static or downward trend. These allotments are McAtee Bridge, North Morgan, Bar Seven, Sitz, Shirley and Michel. Primary issues on these allotments include: impacts from abandoned mines, loss of dominant plant communities, noxious weeds and invasive species, reduced herbaceous vegetation production and vigor, localized areas of increased bare ground and consequently higher potential for wind and water erosion and decreased water infiltration efficiency. Allotment specific information is available in the Madison Watershed Assessment Report.

McAtee Bridge, North Morgan, Bar Seven, and Shirley allotments provide big game winter range and the shift from cool season bunchgrass-dominated grasslands, such as bluebunch wheatgrass, to blue grama and club moss or noxious weeds reduces forage on winter range. Table 9 in the MWA Report lists primary game species and associated habitats.

Sharp-tailed grouse were historically found in the MW however there are no known leks today. The most recent record of sharp-tailed grouse was during the 1996 Christmas Bird Count. None of the biologists consulted during the MWA have records of sharp-tailed grouse in the area. Sharp-tailed grouse are typically found on native bunchgrass-shrub habitat.

Sagebrush habitat comprises 11% of BLM administered land in the MW and is meeting Upland Health Standards. Sagebrush is important forage for pronghorn and mule deer, especially during the winter. In the spring, sagebrush and grasslands provide elk calving habitat. The Missouri Flats lek, located on private land in the southern portion of the watershed, is the only known sage grouse lek in the MW. It has been inactive since the late 1980's/early 1990's. Sage grouse are seen during the nesting and brood-rearing seasons in the southern-most portion of the MW. They are also found in summer habitat in the Axolotl Lakes and V.C. Hill allotments. Sagebrush habitat north of this area along the east side of the Tobacco Root Mountains does not have any recent reports of sage grouse nor sage grouse sign. In the 1970's the Revenue Common allotment was a popular sage grouse hunting area and sage grouse were known to winter in the area. Despite the implementation of a rest-rotation grazing system and an AUM reduction in the 1980's, leading to an improvement in range condition, sage grouse are not known to currently occupy this area. The major contributor most likely leading to sage grouse no longer using the area is the intense recreational use and increase in subdivisions and housing development.

Compared to the 1970's, the amount of development and recreational use has substantially grown.

Conifer expansion into existing sagebrush habitat was noted in many areas at the forest-sagebrush ecotone. This expansion of forest can result in habitat conversion and a loss of sagebrush habitat. In part, this is due to the relative lack of fire during the past 120 years.

3.2.3 Issue #3: Forest and Woodland Habitat

Forest and woodland habitats comprise approximately 33% of all ownerships, and approximately 39% of BLM administered lands within the MW. The close association of forests with adjoining sagebrush and riparian habitats supports a broad array of wildlife species. This habitat provides important thermal and hiding cover, including security habitat for big game.

Forests in the MW provide habitat for a large variety of species including mountain lions, dusky grouse, ruffed grouse, northern goshawk, black bear, bobcat, and wolverine. This habitat provides important linkage corridors for grizzly bears, Canada lynx, gray wolf and other large carnivores. Forest-dwelling bird species require suitable nesting and foraging habitat. Several bird species help protect forests by eating millions of damaging insects, such as the western spruce budworm.

The relisting of the Greater Yellowstone Ecosystem grizzly bear population as threatened under the Endangered Species Act (ESA) was largely due to whitebark pine declines, as whitebark seeds are an important grizzly diet component. BLM administered land in the MW provides corridors between potential Canada lynx habitat on Forest Service administered lands at higher elevations. Canada lynx distribution is largely tied to snowshoe hare occurrence. Snowshoe hare require dense, multi-layered understory with a high density of young conifer stems and/or branches that provide cover and browse at ground level and at varying snow depths throughout the winter (Ruediger et al., 2000). The age class of conifers required for snowshoe hare habitat is uncommon on BLM administered lands in the MW.

Limber pine, Rocky Mountain juniper, Douglas-fir, and curleaf mountain mahogany woodlands are present on drier, rocky slopes and lower elevations. The scattered patches of mountain mahogany found on rocky slopes and ridges throughout the watershed provide year-round cover and forage for deer and are a crucial source of winter forage for many wildlife species. Mountain mahogany is also a good source of protein for wintering big game. Limber pine seeds provide critical food for rodents and birds, including squirrels and Clark's nutcrackers, which also cache the seeds for later use. Other birds, small mammals, and bears benefit from these caches.

Douglas-fir habitat types are commonly found on lower elevation forested slopes. Drier slopes may contain some component of juniper, limber pine and/or mountain mahogany. The majority of the lower elevation forest types are single story, closed canopy stands consisting mainly of Douglas-fir trees 150 years or less in age, with intermixed lodgepole pine, and spruce. Some stands also contain scattered "relic" Douglas-fir trees greater than 200 years old. Comparing historical photographs to current conditions shows an increase in tree density within stands, a loss of mountain meadows, and decline or loss of upland aspen stands (Gruell, 1983). The

increased density within stands has resulted in trees competing for limited nutrients and moisture, leading to reduced vigor and growth of individual trees.

Mid to upper elevation forests are generally the transition zone from Douglas-fir to lodgepole pine, Engelmann spruce, subalpine fir, and eventually whitebark pine. Higher elevation lodgepole/spruce/subalpine fir forest provides summer habitat for mule deer and elk, and yearlong habitat for moose and large carnivores.

Spruce is found in most forested habitat types, either scattered throughout, or concentrated in wetter areas. A hardwood component, including quaking aspen, Rocky Mountain maple, chokecherry, willow and alder, may also be found in the wetter forested areas or around springs. Aspen stands are relatively minor in this area but are an important component on the landscape for wildlife values.

Throughout BLM administered lands in the MW, there is very little forested area that is in the early and mid-seral stages (i.e. seedling, sapling and pole-sized trees), with the exception of previously treated areas and those burned by wildfire. The majority of forested stands, in all habitat types, are in late-seral stages and are experiencing mortality from forest insects and disease, or are highly susceptible to insect outbreaks.

Throughout the MW, most lodgepole pines are greater than 80 years old and are in the larger diameter classes. Epidemic mountain pine beetle activity is resulting in mortality of most of this mature (>6" DBH) lodgepole pine. While some of these trees are still green, most exhibit evidence of successful beetle attack. In some areas of the MW, lodgepole as small as 3" DBH showed sign of successful attack by mountain pine beetle.

Mountain pine beetle is also attacking and killing limber and whitebark pine in the MW. In addition to the mountain pine beetle, the exotic white pine blister rust fungus attacks limber and whitebark pine and results in additional mortality of these species. Whitebark pine has experienced extensive mortality in the MW, and in many places has become non-existent or has been replaced by subalpine fir. The live whitebark pines that remain are at high risk of mortality from white pine blister rust and/or mountain pine beetle.

Throughout the watershed, defoliation caused by spruce budworm is generally low to moderate. However, some areas have experienced severe defoliation which has resulted in mortality of Douglas-fir trees (e.g. Willow Creek allotment). The spruce budworm hazard rating is high throughout the watershed due to suitable stand conditions.

Forest Service Insect and Disease aerial detection surveys shows endemic Douglas-fir beetle activity in the watershed, with an increase in activity beginning in about 2000. The more recent Douglas-fir beetle activity mapped by the aerial surveys is predominantly on non-BLM lands. However, most Douglas-fir stands in the MW have a high hazard rating for Douglas-fir beetle due to suitable stand conditions.

The change in forest structure, as well as increased insect and disease activity, leads to a higher likelihood of high-intensity fires occurring in areas that historically experienced more mixed-

severity fires. Due to increasing fuel continuity, fires are also more likely to be of significantly greater size than those which historically occurred.

For more detail on the affected environment of forests and woodlands, see the Madison Watershed Assessment Report.

3.2.4 Issue #4: Noxious and Invasive Species

Large scale ground disturbances in the watershed from various sources (roads, recreational use, mining, historic grazing practices, utility corridors, etc.) have provided open niches for noxious weeds and invasive species. These opportunistic and very competitive species have spread throughout the Watershed primarily along road systems, utility corridors and within other disturbed areas, but are also encroaching into some undisturbed upland and riparian sites.

Leafy spurge, spotted knapweed, hoary alyssum and houndstongue are the primary noxious weeds of concern found in the MW. These noxious weeds are affecting land health in varying degrees in riparian and upland habitats. They reduce biodiversity in isolated areas while posing widespread risk to the biodiversity of many additional locations in the watershed. Many of these noxious weeds are toxic to horses, livestock and wildlife. They also show allelopathic properties by releasing an organic herbicide (spotted knapweed) in the soil surrounding the plant thus impeding the growth of more desirable species.

Other noxious or invasive weeds present primarily as small patches and/or widely scattered infestations in the watershed include cheatgrass, common tansy, black henbane, and Canada thistle. Cheatgrass is found in various sized patches throughout the watershed, primarily on south and west facing slopes where there has been some past disturbance. Black henbane is found primarily along roads, and common tansy and Canada thistle are common in disturbed riparian bottoms.

Invasive Aquatic Species

The New Zealand mud snail is a small non native freshwater snail first identified in the U.S. in the Snake River in 1987. Very shortly thereafter they were found in the Madison River, likely introduced via a fisherman's waders. Today, large concentrations occur in the drainage, competing with native snails and aquatic insects for available food.

Whirling disease was first confirmed in the Madison River in 1994, though was certainly present for several years prior. When it made its first appearance, it rapidly made its presence known, nearly wiping out the rainbow trout population in the river in its first few years.

Potential Invasive Aquatic Species

The Eurasian watermilfoil infestation at Henry's lake in Northeast Idaho that was discussed in the MW Assessment Report was misidentified and entered into the database kept by Fremont county, Idaho from which BLM obtained the data. Misidentification is common with watermilfoil and the experts even have to rely on DNA testing to tell some species apart. This doesn't mean that the threat to the Madison River is any less just that the nearest infestation isn't as close as originally thought. There are still numerous infestations in Idaho and one known in

Montana at Noxon reservoir. Due to the high use of this area by out of state recreationists, the threat from contaminated boots, boats or bait boxes still exists.

Two mollusk species yet to be confirmed in Montana, but found in nearby states, are the zebra mussel and the quagga mussel. Both species, under the right conditions, are capable of occurring at very high densities and could disrupt the food chain in the waters they manage to gain a foothold in. Currently the best method of control for these species is through education of fishermen, boaters and other recreationists to prevent new introductions and prevent further spread of these species.

Since 1989, BLM has been involved in cooperative control efforts with Madison County. Throughout this period, the goal has been to prevent new noxious weed infestations and contain, control or eradicate existing infestations in the MW using Integrated Pest Management.

3.2.5 Resource Concern #1: Special Status Species

Wildlife

Table 10 in the MW Assessment Report lists the special status wildlife species, their occurrence in the MW and preferred habitat. On March 5, 2010 the U.S. Fish and Wildlife Service determined that the greater sage grouse warrants the protection of the Endangered Species Act (ESA) but that listing the species at this time is precluded by the need to address higher priority species first. The greater sage-grouse was placed on the candidate list for future action. Sage grouse habitat in the MW is meeting upland health standards. Sage grouse are discussed above under Issue #2: Upland Habitat and Associated Species.

The Greater Yellowstone Area grizzly bear population was relisted under the ESA as threatened in September, 2009. Grizzly bear have been reported in the Tobacco Root Mountains, and are thought to be transient through the area. Grizzlies are resident in the Gravelly and Madison Ranges. Canada lynx are listed as threatened under the ESA. Forest Service administered land above BLM in the MW may be potential Canada lynx habitat. BLM administered land in the MW provides linkage zones between potential habitats.

Gray wolves were delisted from the ESA in May, 2009. Eight wolf packs use the MW, with an additional suspected pack in the north end of the Gravelly mountains (Sime et al. 2009). The bald eagle was removed from the federal list of threatened and endangered species in August, 2007, and is currently managed as a BLM sensitive species. Bald eagles are still protected under the Bald and Golden Eagle Protection Act. Bald eagles nest and concentrate in the winter along the Madison River and in areas where prey is available.

Westslope cutthroat trout (WCT) were historically widespread in streams throughout the Madison River drainage. Today, genetically pure WCT have been extirpated throughout the assessment area as a result of non native species introductions. Currently there are no streams that support populations of cutthroat trout that meet the management criteria for WCT designation within the assessment area.

Recently Montana FWP stopped the stocking of non native species such as rainbow trout and Yellowstone cutthroat trout into the water bodies in the Axolotl lakes area. Fishable lakes in the

area are now being stocked with native WCT. Adfluvial arctic grayling were stocked into Axolotl Lake along with WCT to provide an additional sport fishery for the public.

Historically, the Madison River supported a population of fluvial arctic grayling. Construction of the Hebgen and Ennis Lake Dams likely resulted in the extirpation of this population. Currently there is a very small population of primarily adfluvial or lake dwelling grayling found in Ennis Lake that occasionally use portions of the Madison River immediately upstream of the lake.

Sensitive Plants

The upper MW has the largest known populations of railhead milkvetch and spiny skeletonweed in the state. Railhead milkvetch is a regional endemic known from southwest Montana, east-central Idaho and northwest Wyoming. Railhead milkvetch is palatable and may decrease under repeated late spring/early summer grazing treatments. Spiny skeletonweed is a Great Basin species that occurs in Montana at the northeastern edge of its range, where it is known only from grasslands in the Madison and Centennial valleys. Grazing would likely favor this plant because it is probably unpalatable and would benefit from a reduction in competing palatable grasses. Both railhead milkvetch and spiny skeletonweed face competition from invasive species, especially leafy spurge, spotted knapweed, and cheatgrass.

Other documented occurrences of sensitive plants in the MW include a small population of Hiker's gentian that inhabits a fen on BLM administered land near the Madison River and a historic record of Tapertip onion located near the Trail Creek trailhead.

3.2.6 Resource Concern #2: Wilderness Characteristics

The MW contains one designated wilderness area and one WSA. The Bear Trap Canyon Wilderness is one unit of the Lee Metcalf Wilderness Area, which was designated as part of the National Wilderness Preservation System in October, 1983. It is comprised of just over 6,000 acres of BLM administered land along the Madison River downstream of Ennis Lake, and contains approximately nine river miles through the canyon. "Outstanding opportunities for whitewater recreation" was the most unique attribute identified among the area's wilderness qualities. Other exceptional wilderness opportunities include wildlife viewing, hunting, fishing, backpacking, and horse packing (on the upper rim only). Although some mining has occurred in the canyon and there is some evidence of activities associated with studies to determine the river's hydroelectric development potential, there is little evidence of any human improvements within the canyon. However, the presence of noxious weeds and invasive species (primarily spotted knapweed, leafy spurge, hoary allysum, and cheatgrass) and human caused wildfires have impacted the native vegetative community and associated natural processes. Seasonally heavy recreation use, and especially heavy pressure from shore-based fishermen, has created reaches with multiple trails accessing the river and impacts to the riverbank. Portions of the upper rim of the canyon along the Pot Trail and Trail Creek Trail have been impacted by unauthorized and/or trailing livestock use.

The Axolotl Lakes WSA contains just over 7,800 acres of BLM administered lands on the north end of the Gravelly Mountains. The WSA was recognized as having significant scenic values, wildlife, and a diversity of primitive recreation opportunities. A unique attribute of the area is the presence of the axolotl, a non-metamorphosing tiger salamander, which resides in Blue Lake. The presence of human imprints in the area ultimately resulted in the recommendation for the

area to be managed as non-wilderness. Human impacts include a constructed vehicle route, evidence of logging, constructed spur roads to prospect pits and mines, a historic gold mill and historic cabins, multiple vehicle ways, a communications tower, and the stock driveway which runs through the middle of the WSA. Substantial unauthorized use of closed roads and trails was noted by the IDT during the MW assessment.

3.2.7 Resource Concern #3: Recreation and Travel Management

Recreation use within the assessment area includes relatively heavy summer use all along the Madison River, 3-season use (except winter) in the Revenue Flats, and throughout BLM administered lands during the big game hunting season. The BLM also manages a popular recreational rental cabin overlooking the Twin Lakes in the north end of the Gravelly Range commonly referred to as the Axolotl Cabin.

The Madison River is a blue ribbon fishery and is one of the state's most popular fishing destinations. The river's exceptional fishery accounts for more than 160,000 annual angler use days (AUDs), and attracts fishing enthusiasts from all over the world (Montana FWP, 2007). Within the MW, more than 140,000 AUDs are recorded annually. River use includes over 180 commercial outfitters permitted under a cooperative agreement with Montana FWP. In addition, the lower Madison River from Warm Springs to Black's Ford is heavily used by float tubers enjoying the relatively warm water made possible by the Madison Dam and the thermal effect of Ennis Lake. The recreational tubers have become the dominant user of the lower river.

Revenue Flats has been a popular location for camping and rock climbing for many years. Use numbers in the area continue to increase annually, the remote location often attracting a "party crowd" expecting to be undisturbed by law enforcement presence and prone to resource-destructive activities. Although law enforcement has been increased in recent years, there continue to be problems with off-road vehicle use, littering, sanitation, and destruction of trees and vegetation. Similar problems are occurring in the Cataract Lake area on BLM lands west of Pony.

Big game hunting season attracts recreationists from throughout the country to hunt elk, deer, and antelope on most BLM lands in the Madison Valley. Off-road vehicle use is the greatest challenge to recreation management during this time.

As a result of the 2006 Dillon Field Office RMP, public motorized wheeled vehicle use is limited to those routes designated as open. All other routes are considered closed, with few exceptions to accommodate administration of permits, to access private lands, or other limited circumstances. The field assessment for this watershed showed that several of the designated routes identified to be open to public motorized use are inaccessible to the public because of posted private lands. Other routes not designated open appear to have been overlooked or omitted as simple mapping errors.

3.2.8 Resource Concern #4: Socioeconomics

There are 31 different business entities or individuals currently authorized to graze livestock and harvest 3,848 public land AUMs on the 39 grazing allotments in the MW. Qualified individuals and business enterprises are authorized to graze livestock through a ten year term grazing lease

(43 CFR 4110). Many use allotments that combine public and private land pastures in a comprehensive management plan. In most cases, private land owned by the lessees is adjacent to, or intermingled with, BLM administered land. All aspects of the ranching operation including calving, breeding, haying, feeding, shipping, summer pasturing, and marketing schedules are planned and implemented with reliance on annual use of public land allotments during a portion of the grazing season. Changes in numbers of livestock, seasons of use, and/or increased labor inputs may have a considerable economic impact on individual operators.

Recreation and tourism is a major component of the economy of the MW. The BLM and Montana FWP cooperatively administer a Special Recreation Permit program for commercial outfitters operating on the Madison River. Approximately 180 commercial outfitters are permitted annually. Nearly all of these permits are for guided float fishing. Based on permit fee collections, it is estimated that this industry generates nearly three million dollars annually. BLM also permits eight shuttle companies that support river recreation opportunities. Based on fee revenues, it is estimated that shuttle companies generate ¼ -½ million dollars annually. Fishing tackle sales, boat and trailer sales, restaurants, motels, clothing, and other associated businesses also clearly benefit from the high levels of recreational use within the Madison River valley. Recreational use during the hunting season also provides similarly substantial contributions to the local economy.

On page 252 of the Proposed Dillon RMP/Final EIS, Table 48, Employment and Labor Earnings by Major Type and Sector in 2000, reports that private on-farm employment accounted for 14 % of total employment in Madison County. The National Agricultural Statistics Service data from 2007 reports that, of Montana's 56 counties, Madison county ranked 4th in total hay production; 10th in total cattle numbers; and 12th in sheep numbers. Please refer to Table 56 on page 286 of the Proposed Dillon RMP and Final EIS, which shows employment and labor income response coefficients related to livestock grazing, timber management and recreation use for the area influenced by the Dillon Field Office.

In addition, page 251 of the EIS presents personal income statistics from 2000 that indicate that labor earnings are the largest source of income in Madison County. The Proposed Dillon RMP/Final EIS is available at http://www.blm.gov/mt/st/en/fo/dillon_field_office/rmp/Final.html.

3.2.9 Resource Concern #5: Wildland Urban Interface

The wildland urban interface (WUI) is defined in the Dillon RMP as the line, area or zone where structures and other human developments meet or intermingle with undeveloped wildland or vegetative fuels. During the 2009 field assessment, the IDT observed scattered permanent homes and seasonally-used cabins throughout the MW that are considered to be in the WUI. The community of Pony is the largest concentration of residences near BLM administered forested land. Both historic and recently constructed structures in the Pony area are in the WUI. High fuel loads on BLM administered land adjacent to the Sun West Ranch subdivision was also noted as a WUI concern. In the event of a wildfire, fuel reduction projects and adequate survivable space around structures improve the chances of withstanding a wildfire unharmed. The mixed ownership of private land and BLM administered land limits large-scale fuel reduction projects

on most BLM administered lands, unless projects are done in cooperation with private landowners.

3.2.10 Resource Concern #6: 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 Madison Planning Area were lower than that observed in other planning areas, with the average site density of one site for every 495 square miles.

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 inventories conducted on public lands within the MW analysis area. Within the study area, approximately 3,660 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 one acre, to as much as 100 acres in extent, and public lands within at least 23 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 63 recorded cultural properties within the MW study area. Of that number, 52% are prehistoric, 45% are historic, and 3% have a combined prehistoric and historic component. No paleontological sites are known within the watershed.

Sites within the MW are divided between the lower terraces of the Madison River and the lower foothills of the northern Gravelly and eastern Tobacco Root mountains. Prehistoric sites consist of campsites used primarily for food and tool procurement including processing tasks. The majority of the historic sites are associated with mining, with some homesteading interspersed. Historic sites are located primarily within the surrounding foothills. Seven sites have been formally evaluated for significance and eligibility for the National Register of Historic Places with one site, the Christenot Mill, on the National Register. To date, traditional cultural properties or traditional life-way values of special concern to American Indian groups have not been specifically identified within the MW.

Chapter 4

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 issues and resource concerns. The environmental consequences are disclosed and analyzed by alternative for each issue. This chapter also discloses the cumulative, or combined, impacts of alternative actions with past, present and reasonably foreseeable actions within the watershed.

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

4.2 Predicted Effects of Alternatives

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

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

Twenty three grazing allotments which contain riparian habitat are in compliance with the Riparian Health Standard. Although riparian, forestry/fuels, WUI, biodiversity or noxious weeds issues may be present on some of these allotments, current grazing practices are facilitating/allowing healthy riparian conditions on BLM administered public lands and these trends are expected to continue.

When used, livestock supplement should be placed on ridges or terraces at least ¼ mile from the nearest livestock water source in areas naturally devoid of vegetation. Proper salting improves cattle distribution and forage utilization, but when done in conjunction with other management practices and/or projects animal behavior is most affected. The use of protein blocks will be encouraged away from riparian areas during fall grazing treatments to reduce herbivory on riparian woody species (willows, aspen).

Riding and herding will continue to be emphasized and utilized to improve livestock distribution, reduce the amount of time cattle spend in riparian areas, sustain resources and increase animal production. BLM technical reference # 1737-20, *Grazing Management Processes and Strategies for Riparian-Wetland Areas* (2006) states: “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 lead to improved riparian conditions that benefit fisheries and wildlife while improving water quality.”

Regulating livestock use around live water sources and wet meadows by fencing, grazing or herding management to restrict overuse protects vulnerable forbs and grasses for a variety of wildlife species. However, livestock grazing could periodically be used inside meadow enclosures to reduce old vegetation, thereby exposing and rejuvenating succulent forbs (Evans 1986).

The Canada goose nest boxes on Wall Creek AMP have not been maintained and are not being used. It is time intensive to maintain the nest boxes and the limited amount of use they would receive does not make it worthwhile to retain them. Since geese have not used the nest boxes for many years, removing them will have no effect on the geese and will improve aesthetics in the area.

Issue #2: Upland Habitat and Associated Species

The Upland Health Standard in 33 allotments in the MW is not currently being adversely impacted by BLM authorized activities, including livestock grazing. Although riparian, forestry/fuels, WUI, biodiversity or noxious weeds issues may be present on some of these allotments, current grazing practices are not contributing to Upland Habitat concerns. Therefore, no changes to the terms and conditions of these grazing leases will be implemented based exclusively on the condition of the upland habitat. The health of the uplands and associated upland species, including sagebrush obligate species, is expected to remain in PFC.

Temporary electric fence, livestock supplement placement (salt, protein block), riding and herding are encouraged, and may be required as a means of improving livestock distribution in all alternatives. Although strategic salt placement is an inexpensive and effective distribution tool, research has shown that it is not as persuasive in modifying livestock distribution patterns as water developments (Ganskopp 2001), or the strategic placement of energy or protein supplements such as low-moisture blocks (Bailey and Welling 1999). The use of dehydrated molasses supplements is an effective way to lure cattle into underutilized rangeland. In a study conducted on two Montana ranches, cattle remained within 600 meters of supplements, even when located on steep rugged terrain and relatively far from water (Bailey, Welling and Miller 2001).

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 will reduce barriers to wildlife movement and 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 animals to pass over or under these fences with a reduced risk of entanglement. Installing wildlife escape ramps enhances the ability of birds, bats, and other small mammals to get out of water developments and avoid drowning.

Issue #3: Forest and Woodland Habitat

The current mountain pine beetle epidemic will continue under all alternatives, including the no action. At the current epidemic level of activity, vegetation management is unlikely to stop the spread of mountain pine beetle (Colorado State Forest Service, 2009). The epidemic is expected

to continue until the majority of mature lodgepole pine trees have been killed by the beetle. The difference between the alternatives is the amount of wood product material that would be salvage harvested from this epidemic, and the resulting effects of those actions.

Hiding and thermal cover may be greatly reduced for wildlife as trees die and fall over. Foliage-gleaning and bark-gleaning birds may decrease in number with more beetle-killed trees however woodpeckers increase with the number of dead trees and increase in insects under the bark of dead trees (Amman and Schmitz, 1988). Mountain pine beetle outbreaks offer black-backed and three-toed woodpeckers food resources and habitat similar to burned forests (Bonnot et al. 2008).

Issue #4: Noxious and Invasive Species

Human activities, such as road maintenance activities, recreation, mining, and other disturbances, as well as livestock, wildlife, wind, water and fire will continue to spread weeds into and within the watershed. Noxious weeds will continue to be treated as resources allow through the existing cooperative effort between the BLM, Madison County, private landowners and other partners. This will likely maintain noxious weed infestations at current levels or result in a slow decrease in plant densities.

Continuation of the Madison River Sheep grazing project will result in a decrease in the number of viable spotted knapweed seeds as well as the eventual decrease in the size and density of the infestations. Monitoring conducted on this project over the past several years has shown that seed production is 75 – 85% less on spotted knapweed plants that have been grazed by sheep than those left un-grazed.

Recreationists using waterways in the MW will continue to be the biggest risk of new aquatic invasive species introduction. A continued cooperative educational effort by State, Federal and local authorities is essential for reducing the risk of new aquatic invasive species.

With continued implementation of the Bear Trap Wilderness Weed Management Plan at its current level, the size and density of the noxious weed infestations within the wilderness boundaries will continue to be reduced.

Resource Concern #1: Special Status Species

A summary table and a detailed discussion of predicted effects and potential impacts to special status plants and their habitat is provided in the Biological Evaluation (BE) for Special Status Plants on BLM Lands in the MW (see Appendix C).

A Short Form BE for Special Status Fish and Wildlife Species (Appendix C) provides a summary of whether or not special status fish and wildlife species are affected by the proposed alternatives and potential impacts. Potential site-specific impacts to special status wildlife species are included in the allotment discussions below where appropriate.

Amending grazing leases to state that livestock losses may occur from wolves will create awareness, and minimize conflicts between lessees and agencies responsible for managing the wolf population. Range riders may also reduce conflicts between livestock and wolves (Smallidge et al 2008).

In areas where grizzly bear conflicts with livestock are likely to occur, a stipulation will be added to grazing leases stating that the lessee, agency personnel, and Montana FWP will jointly determine how to properly treat or dispose of livestock carcasses to reduce the potential for attracting grizzly bears. Later turnout dates (e.g. July) for cattle and older calves at time of turnout can help reduce potential grizzly conflicts. However, a grizzly may predate any age or size of livestock. Amending grazing leases to state that livestock losses may occur from grizzly bears would create awareness and reduce conflicts between lessees and agencies responsible for managing grizzlies.

Since greater than 80 percent of sage grouse nests occur within two miles of a lek in southwestern Montana (MFWP 2005), locating leks in the MW will facilitate monitoring of nesting and brood-rearing habitat in the watershed. If an active lek is found, monitoring male lek attendance provides an index of relative change in abundance (MFWP 2005).

Resource Concern #2: Wilderness Characteristics

Wilderness characteristics in the Bear Trap Canyon Wilderness will continue to be maintained through management according to the wilderness management plan and the Limits of Acceptable Change plan prepared for the area. An update for these plans is scheduled to be completed during FY 2011 in coordination with the Lee Metcalf Wilderness Coordinating Committee to address emerging issues.

Wilderness characteristics in the Axolotl Lakes WSA will continue to be maintained through management in accordance with the Interim Management Policy for Lands Under Wilderness Review (BLM Handbook H-8550-1). Naturalness, opportunities for solitude and primitive and unconfined recreation were identified as important wilderness values present in the Axolotl Lakes WSA. Special features included scenic quality, and specifically mentioned the presence of steep canyons, cliffs, timbered slopes, ridgetop parks, etc.

According to Samman and Logan (2000), “Large-scale [bark beetle] outbreaks have short-term effects on recreational use of wilderness areas, particularly in regard to scenic quality, trail access, and public safety.”

Resource Concern #3: Recreation and Travel Management

Public demand for outdoor recreation and access to their public lands will continue to increase within the MW. Implementation of the travel management plan in the Dillon Field Office RMP (2006) will discourage the creation of new vehicle routes on public lands which will slow the spread of noxious weeds and motorized vehicle-caused soil erosion throughout the watershed.

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

Resource Concern #4: 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 and private land lease rates in Montana for 2010 average \$18.00/AUM.

Current trends in the livestock and timber markets and associated expenses will continue. 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 #5: Wildland Urban Interface

Residential development is expected to continue in the area. The increasing number and density of privately owned structures will result in more complex and intense fire suppression efforts in the event of a wildfire.

The management of wildfire will continue as defined in the Dillon RMP and Dillon Fire Management Plan.

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

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

The No Action Alternative would not meet riparian, wetland, or aquatic habitat objectives along stream reaches or at springs where resource concerns were identified. Alteration of stream morphology (channel shape and gradient), vegetative composition, vigor, structure and cover, conifer encroachment and/or excess sediment input would continue. Negative impacts from ungulate trampling to wet meadows, spring sources, and spring brooks would continue, and ecological functions would continue to be degraded in these areas.

Under this Alternative, none of the livestock management related riparian issues or concerns identified by the IDT and documented in the MW Assessment Report would be addressed. 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). Under Alternative A, no new AMPs or projects (fences, water developments) would be initiated to address concerns on 17 stream reaches (9.8 miles) that failed to meet the Riparian Health Standard. Some site specific riparian habitats would continue to be impacted by ungulate browsing on palatable woody species resulting in limited recruitment and regeneration.

Wildlife habitat in some riparian areas would continue to be affected by reduced vegetative and woody cover, species composition and structural diversity. Decreased aspen, willow and sedge dominated communities limit biodiversity by reducing habitat available for amphibians, migratory birds, nesting waterfowl, and browse for wild ungulates.

Fish streams assessed for the MW were found to be in PFC condition and would continue to be under Alternative A.

Under this alternative, Rocky Mountain juniper would continue to increase at the expense of other riparian woody and herbaceous species on some streams. Increasing juniper was determined to be a primary cause of FAR conditions on stream reach 604 in the Trail Creek

C&H AMP allotment. Although reach 606 in the Jourdain Creek allotment is properly functioning, juniper expansion into the riparian area is a concern. Rocky mountain juniper has an extensive stoloniferous root system which is very efficient in competing for limited water and soil nutrients. The elimination of the understory, resulting in more bare ground, would enhance erosion potential resulting in increased sediment inputs into the streams (Herman 1958). If juniper expansion continues in the riparian area, wildlife use of these areas would be impacted by loss of browse and forage. Juniper would continue to provide hiding and thermal cover for big game species.

Issue #2: Upland Habitat and Associated Species

The low terraces along the Madison River are comprised of well drained rocky soils that support a native plant community dominated by various cool season grasses. The No Action alternative would perpetuate current conditions on three grazing allotments adjacent the river (McAtee Bridge, Bar Seven and North Morgan) that are not meeting the Upland Health Standard. The proportion of key indicator species bluebunch wheatgrass, needleandthread and western wheatgrass would continue to be suppressed, and other grass and shrub species that are indicative of overgrazing on these ecological sites e.g., blue grama, broom snakeweed and prickly pear, would continue to dominate these sites. Established infestations of invasive species (e.g., cheatgrass and spotted knapweed), are more likely to increase under this alternative.

Existing conditions and trends in sagebrush and upland habitats would continue under this alternative. In some allotments (e.g. Preacher Creek AMP, Wallace Peak AMP and Revenue Common AMP) conifers are expanding into sagebrush and grassland habitat and that trend is expected to continue. As stated in Hyerdahl et al. (2006), “in the continued absence of fire, mountain big sagebrush and grasslands in southwest Montana are likely to become more homogenous as Douglas-fir trees continue to encroach.” Without any natural or human caused disturbances some areas currently occupied by sagebrush and scattered conifer seedlings would be converted to a forest cover type within approximately 30 years. Conifer encroachment into sagebrush communities would continue to reduce sagebrush obligate species’ habitat.

Continuation of current grazing practices on allotments listed above where concerns were identified would result in a continued suppression of forbs and cool season bunchgrasses and may continue to limit cover and forage for ground nesting birds, wintering big game, and small mammals.

Suitable habitat conditions exist for sagebrush obligate species within sagebrush habitat on allotments meeting upland and biodiversity standards. Under Alternative A, habitat conditions for sagebrush obligate species are expected to continue being met throughout the MW.

Issue #3: Forest and Woodland Habitat

Implementation of the No Action Alternative would leave the forest and woodland stands undisturbed by the treatments proposed in the action alternatives. Current conditions and forest trends would continue until interrupted by natural events (e.g. wildfire, windthrow), insects and disease, and/or changes in weather or climate.

Mature lodgepole pine trees would continue to be killed by mountain pine beetle. “Mountain pine beetle epidemics can substantially alter the ecosystem by reducing crown, thermal, and hiding cover, increasing forage production, releasing or converting to other tree species, creating large amounts of dead trees and logs, limiting access for large ungulates and recreationists, increasing fire danger, and providing a different mix of habitats for a variety of animal species” (Worrall, 2000). Where lodgepole pine trees have died in and around aspen stands, aspen are expected to benefit in vigor due to increased sunlight, water, and nutrients. Understory plants would also increase in vigor with increased light, moisture, and nutrients.

Generally, it takes five to 10 years for a beetle killed lodgepole pine to fall to the ground. While the trees are standing and have red needles on them, crown fire hazard is greatly increased. As the needles, and then the trees, fall to the ground, crown fire hazard is reduced and surface fire hazard is increased (Bentz et al, 2009). 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) would release and become dominant in the stand.

Under the No Action Alternative, mountain meadows would continue to be lost and aspen would continue to decline due to conifer expansion and competition for resources. High density Douglas-fir and mixed conifer stands have high hazard ratings for western spruce budworm and Douglas-fir beetle. Continuation of spruce budworm activity would result in additional defoliation, reduced growth, and predisposition to attack by other insects and diseases. Repeated defoliation by spruce budworm may result in top-killing and tree mortality (Fellin and Dewey, 1992). The continued epidemic of spruce budworm in the MW would allow for “natural” thinning of the Douglas-fir forest which would reduce densities towards more historic stocking levels. However, defoliation by spruce budworm would also weaken trees and make them more susceptible to bark beetles. This increased susceptibility, in combination with suitable stand conditions, may cause Douglas-fir beetle activity to increase. During Douglas-fir beetle outbreaks, large-scale tree mortality can cause significant economic losses, degradation of wildlife habitat, increased wildfire risk, and diminished aesthetic values associated with forests (Dodds et al., 2006). In outbreak conditions, groups of dead trees may total 100 or more and yearly mortality may extend into the millions of board feet (Kegley, 2004).

The various bird species that eat millions of forest damaging insects, including spruce budworm, and woodpeckers that feed on insects under the bark of dead trees would benefit from these food sources. However, once the beetle and budworm outbreak is over and the trees are dead and falling over, these bird species would lose this food source. Foliage-gleaning and bark-gleaning birds may decrease in number with more beetle-killed trees.

Deadfall would provide habitat for small mammals, including denning sites but would also hinder big game movement through the area. Loss of cover, as a result of fire or bug kill, 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. If fire does not move through the area, the deadfall would remain on the ground for many years, hindering big game movement

and reducing hiding and thermal cover until increased sunlight reaching the ground beneath the deadfall stimulates stand regeneration.

Mountain pine beetle and white pine blister rust would continue to cause mortality of limber and whitebark pine. In some areas, limber pine habitats may undergo a species conversion to Douglas-fir and/or juniper. Whitebark pine habitats are at high risk of loss due to extensive mortality and lack of disturbance which leads to the promotion of successful regeneration. If whitebark pine is extirpated from these areas, they may either be replaced by subalpine fir, or the areas may remain bare due to the harsh environment from which this species is found. The loss of whitebark pine, which has a prostrate growth form thus shading the ground and decreasing the rate of snowmelt, would also reduce snow holding capacities in high elevation sites (Tomback et al, 2001).

Whitebark and limber pine seeds provide critical food for rodents and birds, including squirrels and Clark's nutcrackers, which also cache the seeds for later use. Other birds, small mammals, and bears benefit from these caches. This food source would be reduced as whitebark and limber pine dies.

Issue #4: Noxious and Invasive Species

Spread of noxious and invasive species outside of known infestations would be prevented or mitigated to the degree that resources allow. If there are resource constraints, density and/or size of current infestations may not be reduced. Noxious and invasive species would continue to effect vegetative composition and cover, causing increased run-off and soil erosion, reducing forage for livestock and wildlife and affecting biodiversity and upland and riparian health in portions of the watershed.

Resource Concern #1: Special Status Species

Upland habitat conditions in the MW are currently suitable to support sage grouse. Under current management and trends sagebrush habitat would continue to meet sage grouse seasonal needs. Riparian areas in less than PFC may be limiting brood rearing habitat, however, due to the limited use this area receives, any impacts would be minor.

The relisting of the Greater Yellowstone Ecosystem grizzly bear population as threatened under the ESA was largely due to whitebark pine declines. Whitebark pine decline was a causal factor in not meeting the Biodiversity Standard on the Axolotl and Windy Pass AMP allotments, and was also noted as a concern elsewhere in the watershed. Under Alternative A, whitebark pine would continue to be lost from these areas.

BLM land in the MW provides corridors between potential Canada lynx habitat on Forest Service administered lands at higher elevations. Canada lynx distribution is largely tied to snowshoe hare occurrence. Snowshoe hare require dense, multi-layered understory with a high density of young conifer stems and/or branches that provide cover and browse at ground level and at varying snow depths throughout the winter (Ruediger et al., 2000). The age class of conifers required for snowshoe hare habitat is uncommon on BLM administered lands in the MW and would continue to be under Alternative A.

Resource Concern #2: Wilderness Characteristics

Under Alternative A, wilderness characteristics would continue to be maintained. Impacts from unauthorized livestock use would continue to create visual impacts and cause damage to the recreational trails, especially along the Trail Creek, Spring Creek, and Fall Creek. Although impacts have been reduced in recent years, cattle have historically caused noticeable impacts in these areas, compromising natural conditions and processes, as well as wilderness recreation experiences. Because these impacts have been relatively short-term, and the livestock use is a grandfathered activity, these impacts have been tolerated. Recent changes in ranch management and perhaps the USFS' allotment management are likely to be responsible for reducing these impacts.

Resource Concern #3: Recreation and Travel Management

Recreational use would continue to increase regardless of any proposed management changes. Use of the Madison River corridor would continue to grow during the summer months due to the popularity of the trout fishing and floating opportunities. Fall and winter hunting and winter recreation opportunities would also continue to be very popular.

Travel management would continue to be difficult to enforce due to the presence of sometimes well-used accessible routes that are not designated open to vehicle use, and relatively limited signing thus far for designated routes. Travel management signing would continue to be improved to encourage compliance.

Resource Concern #4: Socioeconomics

Under Alternative A, forage availability and number of authorized AUMs is expected to continue at current levels. Economic benefits attributed to livestock use of BLM lands would remain unchanged. Livestock grazing on 37,000 acres of public lands would provide about 3,800 AUM's of forage on 39 grazing allotments in Madison County. The dependency of livestock operators on BLM forage would remain unchanged. Because authorized grazing use on public land allotments would remain static, real estate values of private base properties would not be influenced by BLM actions.

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. Under the No Action Alternative there would also be no additional opportunities for public utilization of wood products.

Existing economic trends and BLM expenditures would continue under Alternative A. Economic and social conditions were analyzed in further detail for the Field Office under Alternative A in Chapter 4 (p 314) of the Proposed Dillon RMP and Final EIS.

Resource Concern #5: Wildland Urban Interface

Fuel loading would continue to increase in forest and woodland habitats in the watershed. High fuel loads in proximity to residential development on private lands and near essential access routes would increase the cost and decrease the effectiveness of wildfire suppression efforts. The increasing ratio of more dead trees to live trees would influence wildfire behavior and

available effective fire suppression tactics. High fuel loads near ingress/egress routes would affect emergency evacuation procedures.

4.2.3 Predicted Effects Common to All Action Alternatives

Livestock Administration

The Cooperative Agreement between the Montana Agricultural Experiment Station and the Dillon Field Office of the BLM concerning grazing management on BLM administered lands within the Red Bluff Experiment Station would be reviewed. If necessary, changes to the current management agreement may include the development and implementation of an allotment management plan (AMP) with specific terms and conditions limiting livestock numbers and season of use on the Red Bluff grazing allotment. The predicted effects of any new management plan would be to sustain the five standards of rangeland health which are currently being met.

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

Overall effects of livestock grazing on composition of riparian vegetation due to dietary preference and selectivity of forage under action alternatives have been developed to make measurable progress towards site specific objectives and are expected to be positive 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 MW 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).

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 can be 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 should 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 inch sedge stubble height guideline would benefit stream channel morphology by reducing impacts to stream banks and bank-holding 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 stream banks. Annual use guidelines may reduce excessive wetland hummocking and drying. Improvements in stream channel morphology and reduced impacts to streamside wetlands would reduce sediment input associated with channel erosion.

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

Fencing spring sources and associated wet meadows would benefit the spring's ecological functions and hydrological processes, conserve habitat for rare plants, if they are present, and improve existing habitat for wildlife. Wetland exclosures would mitigate and prevent livestock induced hummocking, the compaction of moist wetland soil, and the subsequent raising of bumps or mounds.

A common effect within riparian or spring exclosures is an increase in Canada thistle if it is present at the site prior to fencing (pers. comm. Dewey, 2007). New exclosures would be monitored for noxious weeds and treated where necessary.

Water development in upland areas is often a key factor in reducing livestock watering in riparian areas. Fencing the source would protect the associated habitat in the immediate vicinity. Ehrhart and Hansen, (1997) state "The one quantifiable factor which was highlighted in successful riparian management was *the presence of off-stream water*. 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. Alternate sources of water appear to be an important tool to encourage livestock to move away from the riparian area". Alternative water provides cleaner water for livestock and releases pressure off streams and wetlands reducing waste inputs to streams, soil compaction, channel damage and grazing on riparian vegetation.

Augmenting the water development with shade, such as placing the watering trough near existing trees, would also help to reduce the time livestock spend in riparian areas (TR-1737-20, 2006). Design features for spring developments, listed in Section 2.3.3, would mitigate the potential of drying up or shrinking wetland areas associated with spring sources.

Restoring riparian health is expected to have a beneficial impact on wildlife and fisheries habitat by increasing forage and security cover as well as reducing sediment input into streams. Forbs are an important summer food source for sage grouse broods. Later in the summer, as palatability of forbs declines, sage grouse move to moist areas that still support succulent

vegetation, including wetland and riparian areas. Altering livestock grazing to improve riparian conditions would benefit sage grouse, especially during brood-rearing when forbs and insects are essential to their diet.

Two new stream crossings are proposed in association with forest and woodland treatments. One would be a hardened crossing on Cataract Creek and the other would be a culvert in Antelope Creek tributary in the Windy Pass Allotment. In addition, a dysfunctional culvert under the county road on Hot Springs tributary in the Elmer allotment would be replaced to address riparian concerns. Stream dimensions, patterns and profiles would be improved or maintained and the streams would neither aggrade nor degrade as a result of properly designed, sized and installed culverts. Short term impacts during installation of both the culverts and the hardened crossing would include sedimentation and vegetation disturbance on a localized basis.

Issue #2: Upland Habitat and Associated Species

On the majority of BLM uplands, utilization of forage plants was found to be less than 50%. For those areas where site specific concerns were identified, limiting use of upland forage to 50% during spring and summer treatments would benefit water infiltration and plant vigor, reduce soil loss through overland erosion and leave adequate residual cover and forage for wildlife and would enhance herbaceous plant community cover and composition. Increased cover would improve precipitation infiltration which would reduce soil erosion, overland sediment transport, and sediment delivery to streams. Earlier grazing treatments allow sufficient time for plant re-growth while later deferred treatments enhance seedling establishment and species composition. Deferring livestock use until after the growing season mitigates grazing impacts to cool-season bunchgrasses and reduces trampling of forbs.

With the exception of the range improvement projects that would be removed, existing improvements would remain permanent features within the watershed. Construction of new fences may impede movement and be an entanglement hazard for wildlife, but following BLM Handbook H-1741-1 specifications for constructing wildlife friendly fences and livestock enclosures would reduce the risks to 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.

Water troughs, mineral placement, and trailing along fences would cause some localized impacts to vegetation and soil compaction but would be considered incidental. The proposed water developments are designed to improve livestock distribution and are expected to change utilization patterns so that more use would occur on upland forage plants and less in riparian areas. New livestock water troughs may also provide increased water for wildlife if they are available when livestock are not present. Soil compaction and loss of vegetation is expected in the immediate vicinity of the new water trough and increased forage utilization can be expected within a ¼-mile of the troughs due to concentrated livestock use within close proximity to these watering locations. New two-track ways may be created along pipeline routes. Use may be authorized on these routes for administrative and maintenance purposes by permit holders and BLM employees.

The grazing flexibility provision would provide the BLM and affected lessees' 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.

Suitable habitat conditions exist for sagebrush obligate species within sagebrush habitat on allotments meeting upland and biodiversity standards. BLM would maintain existing sagebrush habitat so that 75% or more of big sagebrush communities provide vegetative composition and structure for sagebrush obligate species. Residual grass cover following grazing is important for sage grouse nesting habitat. Light to moderate cattle grazing or managed grazing systems can improve quantity and quality of summer forage (i.e. forbs) for sage grouse (MFWP 2005). Implementing an annual utilization guideline of 50% on cool season bunchgrasses to maintain plant health and vigor would provide residual herbaceous nesting cover.

Targeting new noxious weed infestations for eradication would help keep new populations or new plant species from becoming established. Using biological control and/or aerial application on larger established infestations would reduce the size and density to more manageable levels.

Re-introducing natural disturbance regimes i.e., prescribed fire, would result in a mosaic of plant communities and diversity of successional stages in sagebrush habitats.

Issue #3: Forest and Woodland Habitat

Protecting individual limber pine and whitebark pine trees that are suspected of being blister rust resistant from both fire scald and bark beetle attack, as well as collecting cones from these trees, would contribute to the genetic breeding program, and could help the long-term sustenance of these species on the landscape. Planting whitebark pine seedlings would promote a new cohort of whitebark pine, and cutting competing conifers around healthy whitebark pine would reduce competition and improve the vigor of existing healthy whitebark pine trees. Improving whitebark and limber pine would promote habitat and encourage this food source for wildlife species, such as squirrels, Clark's nutcrackers, and bears.

Harvesting timber with beetle infestations would reduce the food source available to black-backed, three-toed and downy woodpeckers that feed on wood-boring beetle larvae in those treatment units. However, since the beetle outbreak covers such large acreages in the MW, these bird species would have adequate habitat available. The benefits of salvage harvesting these units include regeneration of healthy trees used by foliage and bark gleaning bird species.

Harvesting trees would remove big game thermal and hiding cover. However, regeneration of new stands would occur faster than if the dead and dying trees are left standing for many years and eventually becoming deadfall. It would take many more years before enough sunlight could reach the soil surface to promote regeneration. Harvesting the trees opens the canopy and

facilitates regeneration sooner, providing hiding and thermal cover in an area surrounded by standing dead trees and/or deadfall.

Forest and woodland treatment units would be surveyed for goshawk nesting prior to implementation. If an active goshawk nest is found in a treatment unit, timing stipulations would be enforced to avoid disturbing nesting activity.

Herbaceous vegetation would increase within all forest and woodland 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 shrubs and 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.

BLM administered public lands in the MW provide corridors between potential Canada lynx habitat on Forest Service administered lands at higher elevations. Canada lynx distribution is largely tied to snowshoe hare occurrence. The age class of conifers required for snowshoe hare habitat is uncommon on BLM administered lands in the MW. Regeneration following the proposed forest and woodland treatments has the potential to provide snowshoe hare habitat. The Aspen Creek unit is within the Madison-Gravelly Range linkage area identified in the Northern Rockies Lynx Management Direction (USDA Forest Service 2007). The other forest and woodland treatment units are not within designated linkage areas. Since the forest and woodland treatments proposed are on such a small scale, it is unlikely that regeneration in these units would lead to snowshoe hare and lynx colonization.

Both 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.

Issue #4: Noxious and Invasive Species

Biological controls for spotted knapweed including seed head weevils, root boring weevils and root boring moths, and for leafy spurge including flea beetles, a stem-boring beetle and a hawk moth that feed exclusively on the target species are expected to reduce the seed production, vigor and competitiveness of existing population of these species. There would be fewer seeds to expand the infestation and reduced vigor would allow native vegetation to compete better with these aggressive invaders and mitigate further spread within and adjacent to existing infestations.

Design features for both forest health/fuels treatments and construction of structural projects is expected to mitigate cheatgrass and noxious weed spread resulting from soil disturbance during treatment/project implementation.

Timing restrictions for aerial application of herbicides is expected to mitigate impacts on migratory bird nesting and big game winter range.

Informing and educating the public about the threat of invasive aquatic species, and effective measures to eliminate transporting them between watersheds, would prevent their establishment within the MW river system and protect native species.

Resource Concern #1: Special Status Species

Special status plants, fish, and wildlife species are discussed under Section 4.2.1 “Predicted Effects Common to All Alternatives, Including the No Action.” Potential site-specific impacts to special status species are included in the allotment discussions where appropriate, oftentimes under *Upland Habitat and Associated Species*, *Forest and Woodland Habitat*, or *Riparian, Wetland, Aquatic Habitat and Associated Species* and not necessarily under the *Special Status Species* heading. Special status plants, fish and wildlife are discussed in the Biological Evaluations (Appendix C).

Resource Concern #2: Wilderness Characteristics

Actions proposed for the protection/enhancement of whitebark and limber pine within the WSA would be conducted in accordance with the Interim Management Policy for Lands Under Wilderness Review, and would preserve the native vegetative communities which would promote the long-term sustainability of the area’s natural processes. The grizzly bear, often viewed as a symbol of wilderness, relies heavily on whitebark pine as an important component of its habitat.

Resource Concern #3: Recreation and Travel Management

Proposed changes to the designated motorized routes would maintain, and in some instances improve public access opportunities for recreation. The designation of certain routes (approx. 1.7 miles total) in the Revenue Flats area would simply legitimize the use of routes that were inadvertently missed during the RMP route inventory and designation process. Approximately 2.5 miles of designated routes in this area are recommended to be closed seasonally from December 1 – May 15 each year to reduce damage to the routes. This seasonal closure would not impact recreational use of this area during the times of highest demand; during the hunting season or for summer recreational use. Certain other routes in that area that are shown to be closed are merely corrections of mapping errors, or are inaccessible across adjacent private lands, and would not effect public recreational access.

Route designation changes in the Storey Ditch area are also primarily corrections to mapping errors. A route proposed to be designated open (.6 miles) in the Kelly Meridian allotment is in response to the private landowner’s request to allow improved public access to promote hunting opportunities on the private lands that were rendered inaccessible by the route being designated closed across BLM administered lands.

Proposed route designation changes in the Strawberry Ridge and Windy Pass areas are also mapping corrections, and would not affect public recreational access opportunities.

Resource Concern #4: Socioeconomics

The economy of Madison County is highly dependent on agriculture. Jobs and tax revenue generated by livestock associated activities are important economic components of southwest Montana. The alternative or combination of alternatives selected by the BLM Authorized

Officer may have a financial impact on an individual grazing lessee and cumulatively on the economic and social fabric of the larger community.

Modifications of use periods in specific pastures or within an allotment, incorporating additional rest or deferment, reducing AUMs and/or reducing numbers of livestock would economically impact ranchers who rely on public land grazing. Operators may have to use private pastures or other areas for longer periods of time and/or may be required to reduce herd size. Additional range improvement projects would increase construction and maintenance expenses for the lessees and the BLM in the short term. In addition, use guidelines in the uplands and riparian areas may necessitate increased labor inputs (riding) by the lessees in order to harvest authorized AUMs.

Providing flexibility in the period of use to adjust to seasonal weather conditions, affecting forage production, may benefit grazing lessees economically by increased weight gain of calves on mother cows grazing more nutritious forage.

A variety of projects are proposed on BLM-administered lands to improve land health. Completion of these projects would affect socioeconomics in various ways including, but not limited to: changing use authorizations, purchasing supplies, providing materials and/or labor, and hiring contractors to complete work. Table 4.1 summarizes the proposed projects on all BLM administered grazing allotments by alternative.

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

Proposed Project	Alternative B	Alternative C
AUMs changes (units)	+ 20	-91
New fence construction, including riparian enclosures/ pastures (miles)	8.75	10.25
Fence removal (miles)	5.25±	4.00±
New spring developments (units)	4	5
New 1,000g troughs (units)	4	5
New stock water pipelines (miles)	0.95	1.20
Spring enclosure reconstruction (units)	1	1
Spring developments abandoned (units)	4	4
New wetland enclosures (units)	7	7
Stream crossing installation/replacement (number)	2	3
Treat riparian conifers (acres)	3	7
Re-designate roads (miles)	6 ±	6 ±
Commercial timber harvest (acres)	180	659
Permitted removal of wood products (acres)	569	375
Non-commercial mechanical/prescribed fire (acres)	350	1785
Comprehensive commercial and non-commercial treatment (acres)	0	350
Land Disposals (acres)	150	0

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.

BLM expenditures would temporarily increase under both action alternatives during the implementation period. Socioeconomics was fully analyzed under Alternative B in Chapter 4 pp 331-332 of the Final EIS for the Dillon RMP.

Resource Concern #5: Wildland Urban Interface

The implementation of prescribed fire and/or 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 management 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).

Visual impacts associated with prescribed burning may include blackened ground and upright dead trees. These impacts are relatively short term as grasses and forbs respond to the nutrient flush as a result of fire. Standing dead trees that are killed by fire generally weather to a light gray color within several years. The length of time these snags remain upright depends on the environmental influences, the integrity of the root system and the tree/shrub species. Mechanical treatments would vary depending on the method used to dispose of slash. Lopping and scattering would result in slash on the ground until it decays. Piling the slash and burning it under high moisture conditions would result in visible piles for up to several years. Untreated areas within upland treatment unit boundaries would provide some visual obstructions to limit sight distances and to visually break up the treatment continuity.

Units identified strictly for commercial harvest and permitted removal of wood products would also provide beneficial effects of reducing fuel loading and potential wildfire intensity on BLM administered land. Though these units are not immediately adjacent to densely populated areas, they are adjacent to privately owned agricultural and timbered land.

4.2.4 Predicted Effects of Action Alternatives B and C by Grazing Allotment

For each grazing allotment, or un-allotted parcel, where management changes or actions are proposed, the predicted effects of each applicable action alternative(s) are presented for each of the issues and resources concerns in the following order:

- Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species
- Issue #2: Upland Habitat and Associated Species
- Issue #4: Noxious and Invasive Species
- Resource Concern #1: Special Status Species
- Resource Concern #2: Wilderness Characteristics

Resource Concern #3: Recreation and Travel Management
Resource Concern #4: Socioeconomics
Resource Concern #6: Cultural Resources

Because some of proposed forest treatment and prescribed burn units cross allotment boundaries, the predicted effects of the action alternatives for **Issue #3: Forest and Woodland Habitat and Resource Concern #5: Wildland Urban Interface**, will be presented separately and analyzed by treatment unit in a separate section following the analysis by grazing allotment.

Headings are omitted under those allotments within which certain issues are not present, are present, but not affected, or previously addressed under section 4.2.3, Predicted Effects Common to All Action Alternatives.

Wilderness Characteristics are discussed under the grazing allotment in which the wilderness or WSA are located.

Aspen Creek #10540

Alternative B

Administrative Actions:

Taking the privately owned middle pasture out of the allotment would have no impacts on public land resources.

Creating the Horse Creek allotment out of the north pasture in the Aspen Creek allotment would have a neutral impact on public land resources. Most of the 80 acres administered by the BLM in the proposed custodial allotment are fenced and inaccessible to livestock. The upland and riparian health in the allotment would be expected to remain in PFC.

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

Developing a spring on private land and piping the water to a trough located on BLM would provide cattle an upland watering site. Virtually all the primary range is located on public land in the upper South pasture where the trough is proposed to be installed. There is also ample shade near the proposed site and cattle given a reliable source of clean water and shade for mid-day resting would not be inclined to drift down hill to the creeks to water and loaf in the riparian area. Reducing time cattle spend in riparian areas would facilitate the natural stream restoration processes. The channel would be expected to narrow over time and improve its ability to transport sediment.

Limiting the duration of hot season grazing and removing livestock early provide for herbaceous re-growth and floodplain function. In a study of 34 grazing systems, successful systems averaged 12.5 days of hot season riparian grazing (Myers 1989). Myers concluded, “duration of grazing treatments becomes a key factor in determining the severity of damage.”

Reorienting existing downfall along the stream channel to eliminate trailing within or directly adjacent to the stream may also impede stream access for big game. However, concerns with this stream reach include excessive browsing of willows, lack of willow regeneration, and a reduction in sedge and aspen. As placing deadfall along the reach improves the riparian habitat,

the associated wildlife species, including migratory birds and big game, would benefit in the long run.

Issue #2: Upland Habitat and Associated Species

Limiting grazing to a maximum of 21 days in July would facilitate the phenological development of key cool season bunch grasses during the spring (May-June). Hormay (1970) found defoliation is most harmful when food reserves are lowest in the spring when plants are rapidly growing. Bluebunch wheatgrass is susceptible to basal area loss and decreased vigor if grazed during the inflorescence emergence stage of development (Clark et. al. 1998). By the first of July, bluebunch and other cool season bunchgrasses in the Aspen Creek vicinity are flowering and would not be adversely affected if utilized by 200 head for 14 days or 140 head for 21 days.

Alternative C

Administrative Actions:

Designating the 80 acres in the North pasture as un-allotted and unavailable for grazing would reduce the number of AUMs billed by 9.

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

Horse Creek on BLM public land in the North pasture is fenced separately from the adjacent private land so designating this parcel unavailable for livestock grazing would sustain proper functioning conditions and riparian health on Horse Creek.

Resting the South pasture once every third year, would accelerate the benefits to riparian habitat restoration outlined above under Alternative B.

Issue #2: Upland Habitat and Associated Species

Proposed projects and predicted effects are the same as Alternative B

Projects:

Proposed projects and predicted effects are the same as Alternative B

Axolotl Lakes #20485

Alternative B

Administrative Actions:

The uplands and riparian habitats in the Gustin AB pasture were determined to be in PFC and delaying the season of use until July 15, and extending it two weeks until October 15, would have a neutral effect. Browsing of woody riparian species along Butcher Gulch may increase marginally during the first two weeks of October as palatability of grasses and protein content decline.

The Blue Lake pasture is an Area of Critical Concern (ACEC) due to the presence of Axolotls, a rare Tiger salamander, in the lake. Although this pasture has been grazed in recent years, designating this pasture unavailable would be in accordance with the Dillon Resource Management Plan (RMP). Among other provisions the RMP stipulates no authorization in the ACEC of any activities that would contribute to nutrient enrichment or increased water temperature (e.g., livestock grazing, timber harvest, wheeled vehicle use, etc).

Resource Concern #2: Wilderness Characteristics

The proposed removal of an abandoned and unneeded spring development within the Axolotl Lakes WSA would enhance the wilderness characteristics of the area by eliminating this man-made intrusion on the natural values within the WSA.

Projects:

Constructing a new enclosure around the spring and associated riparian/wetland habitat located in the Upper Combs pasture would reduce trampling impacts by livestock and wildlife, benefit hydrological processes and function and improve riparian/wetland vegetation vigor and composition.

Alternative C

The proposed actions and predicted effects are the same as Alternative B.

Bar Seven #10457

Alternative B

Issue #2: Upland Habitat and Associated Species

Deferring the grazing season until 10/01 in the River pasture would benefit the composition, vigor, and canopy cover of cool-season bunchgrasses. Clipping studies determined that defoliation of mature bluebunch wheatgrass plants late in the growing season is best for sustainable stand vigor because root food storage reaches its maximum level in un-grazed plants after the active growing season ends (Blaisdell and Pechanec 1949). Grasses are little affected by use in the dormant period because at this time their tops are cured and not important locations for stored food reserves (Hutchings and Steward 1953; Cook 1971). If grazing occurs in the dormant season, when the plant has no use for the leaves and stems of the past season, it loses nothing and gains an uncluttered start on the new season. In the dormant season, grazing benefits the grazed grass (Savory, 1988).

A three-strand high tensile electric fence would be effective controlling the time and duration of livestock use in the River pasture, and minimally disruptive to wintering or migrating deer, elk and/or antelope. Spacing (18" 26" 38") allows for antelope, fawns or elk calves to pass under, and mature deer and elk to easily jump the top wire. When cattle are removed at the end of the fall grazing period, the charger would be turned off until the following grazing season.

Changing the season of use for the River pasture to 10/01 – 12/31 may reduce available forage for elk during the winter in this pasture.

Issue #4: Noxious and Invasive Species

Aerial treatments are expected to reduce large, inaccessible infestations and make future ground based treatments feasible and effective. Only areas with dense infestations of spotted knapweed would be targeted for aerial treatment. Impacts, including mortality, would occur on most existing non-target broad leaf plants in the areas treated aerially. Without treatment the native plants would eventually be eliminated from the plant community from competition and allelopathic effects of spotted knapweed. Overall, herbicide application would enhance the competitive advantage of bunchgrasses, improving forage and cover for wildlife.

Alternative C

Issue #2: Upland Habitat and Associated Species

Resting the River pasture every third year would benefit the upland herbaceous species. Rest would allow grasses and forbs to complete their entire physiological annual reproductive cycle. Rest would also provide better residual cover and forage for wintering elk during rest years in this pasture.

Issue #4: Noxious and Invasive Species

Proposed treatments are the same as Alternative B.

Elmer #20394

Alternative B

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

The undersized culvert under the county road on Hot Springs tributary in the Elmer allotment would be replaced to address riparian concerns. Stream dimensions, patterns and profiles would be improved over time and the stream would neither aggrade nor degrade as a result of a properly designed, sized and installed culvert. Short term impacts during installation of the culvert would include sedimentation and vegetation disturbance on a localized basis. Replacing the undersized, dysfunctional culvert under the county road will allow the stream to remain within its channel. Natural flows will reduce elevated water temperatures, stabilize banks, improve the width and depth ratio of the channel and allow the stream to establish proper channel sinuosity. Combined, all the proposed actions would facilitate hydrological and riparian habitat restoration processes.

Issue #4: Noxious and Invasive Species

Bio-control insects are relatively effective on reducing the vigor and seed production of leafy spurge. In the short term, reduced seed production would mitigate the spread of leafy spurge in this area and in the long term, reduced vigor would facilitate a decrease in leafy spurge density as native grasses are recruited in areas currently infested by leafy spurge.

Aerial treatments are expected to reduce large, inaccessible infestations and make future ground based treatments feasible and effective. Only areas with dense infestations of leafy spurge would be targeted for aerial treatment. Impacts, including mortality would occur on most existing non-target broad leaf plants in the areas treated aerially. Without treatment these native plants would eventually be eliminated from the plant community from competition with leafy spurge. Overall, herbicide application and bio-control insects would enhance the competitive advantage of bunchgrasses, improving forage and cover for wildlife and vegetative diversity in these areas.

Alternative C

The proposed actions and predicted effects are the same as Alternative B.

Flying D #20420

Alternative B

Issue #4: Noxious and Invasive Species

Bio-control insects are relatively effective on reducing the vigor and seed production of leafy spurge. In the short term, reduced seed production would mitigate the spread of leafy spurge in

this area and in the long term, reduced vigor would facilitate a decrease in leafy spurge density as native grasses are recruited in areas currently infested by leafy spurge.

Aerial treatments are expected to reduce large, inaccessible infestations and make future ground based treatments feasible. Impacts, including mortality would occur on most existing non-target broad leaf plants in the areas treated aerially. However, without treatment most of the native plants would eventually be eliminated from the plant community from competition with leafy spurge. Overall, herbicide application would facilitate a competitive advantage for bunchgrasses, improving forage and cover for wildlife, and vegetative diversity within these sites.

Alternative C

Issue #4: Noxious and Invasive Species

The benefits of aerial and ground herbicide treatments and bio-control insects outlined under Alternative B are applicable under Alternative C.

Experience in other areas of Montana has shown that either sheep or goats are effective bio-control for leafy spurge. By selecting specifically for leafy spurge, this bio-control treatment reduces stand vigor and seed production, therefore in the long term, reducing the density of current infestations and allowing the native grasses and forbs to gain a competitive advantage (American Sheep Industry Association, 2006).

The areas in the Flying D allotment proposed for sheep or goat grazing for weeds are not in close proximity to bighorn sheep and mountain goats during May and June. There is grizzly bear activity on the east side of the lower Madison River, but has not yet been documented on the west side. Using a 24-hour herder, guard dogs, and an electric fence pen at night would mitigate conflicts with bears and wolves.

Jourdain Creek #20410

Alternative B

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

Cutting down juniper within 50 feet of Trail Creek would enhance riparian habitat and hydrological processes. An increase in deep-rooted riparian vegetation (aspen, willows, red-osier dogwood, sedges), would be followed by stream channel improvements, increased water storage capability and widening riparian zones. Sediment may increase for the first couple of years and then decrease due to an increase in vegetative cover along the greenline. The increased cover would be more effective at trapping sediment coming from both in-stream and upland sources.

Alternative C

Same as alternative B

Ledyard-McGuinness #20416

Alternative B

Issue #2: Upland Habitat and Associated Species

Moderate early spring use would provide key cool season bunchgrasses the opportunity to re-grow basal leaves, vegetative stalks, seeds heads and maintain healthy and vigorous root systems. Deferring use until fall would allow all plants the opportunity to complete their entire growth cycle every other year. Removing old growth late in the season would improve the nutritional value and forage quality of grasses for wildlife as well as livestock. Fall livestock grazing may reduce forage available for wintering elk.

Alternative C

Issue #2: Upland Habitat and Associated Species

The proposed actions and predicted effects are the same as Alternative B.

McAtee Bridge #10529

Alternative B

Issue #2: Upland Habitat and Associated Species

Removing the South A pasture from the allotment and eliminating livestock use would allow cool season bunchgrasses the opportunity to be recruited in the area and re-establish healthy vigorous stands. This area adjacent to the Madison River has been grazed early (April and May) for many years, and cool season bunchgrasses like bluebunch wheatgrass decrease in number and productivity under continual early spring defoliation. In one study evaluating the effects of bluebunch defoliation, the most damage occurred during early spring use. Basal area, stem numbers and root and forage yields are reduced under continual spring grazing and plant mortality can be high (McLean and Wikeem 1985). Bluebunch wheatgrass relies on carbohydrate reserves for spring growth. Defoliation during the early spring does not give the plants sufficient time to replenish reserves before entering dormancy, thus ensuring they enter the winter in a carbohydrate depleted state which makes them susceptible to spring grazing.

Classifying 186 acres in the South A pasture as unavailable for grazing would increase forage available for elk winter range and provide better residual cover for small mammals and ground-nesting birds. To facilitate this, construction of a three-strand barbed wire suspension fence is proposed. Since this area receives a lot of winter elk use, this fence may impede movement through the area and be an entanglement hazard for big game. However, constructing the fence to BLM's wildlife-friendly specifications would minimize these hazards for wintering and migrating big game and allow for antelope, fawns and elk calves to pass under the bottom wire and mature deer and elk to jump over the top wire.

Issue #4: Noxious and Invasive Species

Aerial treatments of spotted knapweed are expected to reduce large, inaccessible infestations and make future ground based treatments feasible and effective. Only areas densely infested with spotted knapweed would be targeted for aerial treatment. Impacts, including mortality would occur on most existing non-target broad leaf plants in the areas treated aerially. However, without treatment most of the native plants would eventually be eliminated from the plant community from competition and allelopathic effects of spotted knapweed. Overall, herbicide

application should enhance the competitive advantage of bunchgrasses, improving forage and cover for wildlife and increase vegetative diversity in these areas.

Alternative C

Issue #2: Upland Habitat and Associated Species

Resting the South A pasture for 10 years before re-evaluating range conditions and upland health would provide the native cool season bunch grasses an opportunity to regain vigor and increase production. Low or moderately vigorous bluebunch wheatgrass may take up to six years of protection from herbivory to recover and bluebunch in low vigor produce only two thirds as many flower stalks and total herbage after five years of rest. It may take up to eight years to regain full potential and plant production (Mueggler 1975).

Resting the South A pasture for 10 years should increase forage available for elk winter range and provide better residual cover for small mammals and ground-nesting birds. Constructing three-strand barbed wire fences in the North pasture and along the county road south of McAtee Bridge may impede movement through the area and be an entanglement hazard for big game. Constructing the fence to BLM's wildlife-friendly specifications should minimize these hazards for wintering and migrating big game and allow for antelope, fawns and elk calves to pass under the bottom wire and mature deer and elk to jump over the top wire.

Issue #4: Noxious and Invasive Species

Proposed treatments and predicted effects are the same as Alternative B.

Michel #20417

Alternative B

Issue #4: Noxious and Invasive Species

Treatment of the spotted knapweed in the Michel allotment would reduce the size and density of the current infestation and allow for the existing grasses to gain a competitive advantage. The reseeded of exposed bare ground would fill these voids with desired vegetation and help keep the spotted knapweed from becoming re-established.

MVHP #10550

Alternative B

Administrative Action/Grazing Management:

Not re-issuing the grazing lease would eliminate the need to re-construct approximately 1½ miles of existing barbed wire fence, and build an additional 1½ miles which would be needed to enclose the upper bench pasture for cattle staying overnight as they are trailed through the area. Also, an extension of the pipeline from the well that provides water to the recreation facilities adjacent the river would be un-necessary, as would the installation of a livestock watering trough. In addition, 1½ miles of un-necessary cattle containment fence would be removed, reducing potential injury or death to wildlife migrating and wintering in the area.

Reclassifying this allotment as unavailable for livestock grazing would increase forage available for elk winter range and cover for small mammals and ground-nesting birds.

Resource Concern #3: Recreation and Travel Management

Since there has been no livestock use in this area for about 10 years, not re-issuing the grazing lease would have no effects to recreational users of the camp grounds, picnic areas or boat launching facility.

Alternative C

Administrative Action/Grazing Management:

Re-issuing the grazing lease would require several range improvements. Approximately three miles of four-strand barbed wire fence would have to either be repaired or newly constructed to control authorized livestock. To keep cattle out of the campground area, a pipeline extension from the water system that supplies water to the camping and day use facilities at Palisades would be needed for watering trailing livestock. In addition a water trough would need to be installed in the upper pasture for the cattle that would be stopping over night two nights a year. Impacts to the upland plant community would be neutral or even beneficial as cattle would remove old dormant vegetation which would stimulate re-growth and vigor.

During years when cattle graze the allotment later in the fall, wintering elk forage could be reduced in this pasture. Constructing a four-strand barbed wire fence may impede movement and be an entanglement hazard for big game. Constructing the fence to BLM's wildlife-friendly specifications should minimize these hazards for wintering and migrating big game and allow for antelope, fawns and elk calves to pass under the bottom wire and mature deer and elk to jump over the top wire.

Resource Concern #3: Recreation and Travel Management

Reissuing the grazing lease would impact recreational use of the Palisades Recreation Site to some extent by requiring the new pipeline to be installed from the existing well and pump house (located within the campground area) to the upper bench where the trough would be located. There would be no cattle allowed within the use areas of the recreation site, and recreational visitors would only see the cattle as they drive past the fenced upper pasture.

North Morgan #20423

Alternative B

Issue #2: Upland Habitat and Associated Species

Moderate early spring use would provide key cool season bunchgrasses the opportunity to re-grow basal leaves, vegetative stalks, seed heads and maintain healthy and vigorous root systems. Deferring the use in one pasture until fall would allow all plants the opportunity to complete their entire growth cycle every other year. Deferred rotation pastures have higher forage production and range condition than season long grazing (Owensby et al. 1973). Removing decadent stems and leaves late in the season would improve the nutritional value and forage quality of grasses for wildlife as well as livestock.

Constructing a three-strand barbed wire fence may impede movement and be an entanglement hazard for big game, but the lower top strand may reduce risks. Wildlife-friendly specifications, including a smooth bottom wire, 12 inches between the top two strands, and 38 inch height, would minimize hazards for wintering and migrating big game and allow for antelope, fawns and elk calves to pass under the bottom wire and mature deer and elk to jump over the top wire.

Alternative C

Issue #2: Upland Habitat and Associated Species

A rest-rotation grazing system would increase the vigor and production of the herbaceous plant community because key species would not be grazed every spring. Bluebunch wheatgrass recovers vigor slowly (Mueggler 1975, Caldwell et al. 1981), and spring defoliations over several consecutive years may have a cumulative effect on plant vigor (Wilson et al. 1966, Rickard et al. 1975).

Preacher Creek AMP #20404

Alternative B

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

Creating two upper pastures (Rattlesnake and Preacher Creek) and limiting use to 15 days in the spring, as well as incorporating rest would reduce livestock impacts on streams. Spring use normally results in better livestock distribution between riparian and upland areas (USDI 2006). Spring use provides more opportunity for re-growth and plant recovery. In a 10 year study on Stanley Creek in central Idaho with light to medium late spring use, improvements were found in stream channel morphology (Clary, 1999). Channels narrowed, width depth ratios were reduced and embeddedness improved. Willow communities increased in height and cover as well as species richness. The sedge community would be expected to respond almost immediately followed by the willows. Channel morphology would be expected to lag, however over time channels would be expected to narrow, water tables to rise as natural stream restoration takes effect. Using the Canadian pasture primarily in the fall two of three years would reduce bank impacts and sediment inputs into Canadian Creek. Width depth ratio in over-widened sections would also improve as would the herbaceous species abundance and vigor. However, fall grazing may lead to increased utilization of woody riparian vegetation (willows) as grasses in the riparian area becomes less palatable, less digestible, and lose nutrient content. Shrubs retain their nutrient content longer and cattle may shift preference in order to satisfy their nutritional requirements. Placing protein blocks away from riparian habitat and providing rest every third year would mitigate the browsing impacts on willows.

Forage available for wintering elk may be reduced during years when cattle graze in the fall and winter in these pastures.

Alternative C

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

Resting pastures containing riparian areas more frequently would accelerate the beneficial effects described under Alternative B.

Resting the Rattlesnake and Preacher Creek pastures once every other year would provide better residual forage for wintering elk during rest years in these pastures. Implementing a three year rest-rotation fall grazing system in the Canadian, Token and East pastures will benefit wintering elk during rest years in these pastures.

Red Bluff #00982

Alternative B

Issue #4: Noxious and Invasive Species

Bio-control insects are relatively effective on reducing the vigor and seed production of leafy spurge and have no impact to adjacent vegetation. In the short term, reduced seed production would mitigate the spread of leafy spurge in this area and in the long term, reduced vigor would facilitate a decrease in leafy spurge density as native grasses are recruited in areas currently infested by leafy spurge.

Aerial treatments are expected to reduce large, inaccessible infestations and make future ground based treatments more manageable and effective. Impacts, including mortality would occur on most existing non-target broad leaf plants in the areas treated aerially. Without treatment these native plants would eventually be eliminated from the plant community from competition and allelopathic effects of spotted knapweed and leafy spurge. Overall, herbicide application and bio-control insects would enhance the competitive advantage of native bunchgrasses, improving forage and cover for wildlife and increasing vegetative diversity in this area.

Alternative C

Issue #4: Noxious and Invasive Species

Predicted effects would include the effects described under Alternative B and additionally the effects resulting from using sheep and/or goats as bio-control agents to control leafy spurge as described below.

Experience in other areas of Montana has shown that either sheep or goats are effective bio-control for leafy spurge. By selecting specifically for leafy spurge, this bio-control treatment reduces the vigor and seed production of spurge, therefore in the long term, reducing the density of current infestations and allowing the native grasses and forbs to gain a competitive advantage.

The areas in the Red Bluff allotment proposed for grazing sheep or goats as bio-control for leafy spurge would not be within close proximity to bighorn sheep and mountain goats during May and June. There is grizzly bear activity on the east side of the lower Madison River, but has not yet been documented on the west side. Using a 24-hour herder, guard dogs, and an electric fence pen at night would mitigate conflicts with bears and wolves.

Revenue Common AMP #20407

Alternative B

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

Incorporating a five pasture rest-rotation grazing system and limiting use to 30 days per pasture would facilitate natural stream restoration. Sedges would replace brook grass along stream banks and browsing of willows by livestock would decrease. Physical improvements to stream channels would take time, however, over time channels would be expected to narrow and water tables to rise. Impacts from cattle on stream banks, resulting in sediment inputs, vary with the season of use. Research indicates that impacts to channel morphology appear related to the seasonal trend in soil moisture. As stream bank moisture levels declined during the summer, the extent of channel alteration also declined. Rotating season of use in pastures containing riparian habitat would prevent continuous early season riparian use and reduce channel changes caused

by hoof action. The duration of grazing is a critical factor in managing riparian habitat. Studies have shown that limiting the duration of grazing to 25-30 days is successful in maintaining or improving riparian conditions (Myers 1989a). Also, season of use affects cattle distribution relative to riparian habitat with late summer pastures having more concentrated use of riparian vegetation (Parson et al. 2003). More uniform distribution occurs either early or late in the season, so a seasonal rest-rotation system would distribute more uniformly varying levels of utilization across pastures and riparian habitat.

Placing physical barriers to prevent unauthorized ATV use would eliminate off road vehicle impacts, primarily bank alteration and sediment input, to stream reaches 626 and 671.

Forage available for elk during the winter may be reduced during years when a pasture is grazed later in the fall.

Alternative C

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

The predicted effects described under Alternative B would be consistent under Alternative C. In addition, limiting the duration of use to 21 days in Carmen pasture (reaches 671 and 626) would accelerate improved channel width-depth ratio, decrease sediment inputs, and reduce utilization of riparian vegetation by cattle.

Shirley #10436

Alternative B

Issue #2: Upland Habitat and Associated Species

Even though the number and kind of livestock would be reduced to 12 horses, the net amount of forage authorized to be harvested on BLM lands would remain the same, 65 AUMs. Horses consume more forage each day than cattle and consequently stocking rates are calculated at 1.5 animal units per horse. Winter use (11/15 to 02/28) would benefit upland herbaceous species because they would fully complete their physiological processes each growing season. Winter grazing would not affect the amount of carbon stored in the roots by growing plants, a critical food source for early spring growth.

Expanding the enclosure around the Montana 32 Spring to encompass the entire wetland would enhance the protection of this resource. While the stock pond is not managed as a natural resource, the addition of a stock tank would reduce bank disturbances and enhance riparian attributes.

Issue #4: Noxious and Invasive Species

Bio-control insects are relatively effective on reducing the vigor and seed production of leafy spurge. In the short term, reduced seed production would mitigate the spread of leafy spurge in this area and in the long term, reduced vigor would facilitate a decrease in leafy spurge density as native grasses are recruited in areas currently infested by leafy spurge.

Aerial treatments are expected to reduce large, inaccessible infestations and make future ground treatments more feasible and effective. Mountain mahogany habitat would be avoided during aerial spraying. Only the densest infestations of leafy spurge and spotted knapweed would be

targeted for aerial treatment. Impacts, including mortality would occur on most existing non-target broad leaf plants in the areas treated aerially. However, most native vegetation is already absent within these areas and without treatment, native vegetation would continue to be eliminated from the plant community by allelopathic effects of spotted knapweed and competition from both of these aggressive invaders. Overall, herbicide application and bio-control agents would facilitate native cool season bunchgrasses being recruited back into these sites which would improve forage and cover for wildlife, increase cover and composition of native vegetation and decrease overland flow and erosion.

Alternative C

Issue #2: Upland Habitat and Associated Species

The proposed actions and predicted effects are the same as Alternative B.

Issue #4: Noxious and Invasive Species

Predicted effects would include the effects described under Alternative B, and additionally sheep and/or goats would be used as bio-control agents. Experience in other areas of Montana has shown that either sheep or goats are effective bio-control for leafy spurge. By selecting for leafy spurge and spotted knapweed, this bio-control treatment reduces seed production and vigor of leafy spurge and spotted knapweed. In the short term, reduced seed production would mitigate the spread and establishment of new plants of these undesirable species. In the long term, reduced vigor of leafy spurge and spotted knapweed would facilitate native vegetation being recruited back into these sites and improve vegetative diversity. This treatment, along with the herbicide and insect bio-control treatments would give us more options to manage these dense infestations of noxious weeds and prevent them from spreading into adjacent areas.

The areas in the Shirley allotment proposed for grazing sheep or goats as bio-control to control leafy spurge would not be within close proximity to bighorn sheep and mountain goats during May and June. There is grizzly bear activity on the east side of the lower Madison River, but has not yet been documented on the west side. Using a 24-hour herder, guard dogs, and an electric fence pen at night will mitigate conflicts with bears and wolves.

Sitz #00438

Alternative B

Administrative Action/Grazing Management:

Designating the 150 acre Sitz allotment for inclusion in a future assembled land exchange would result in an opportunity to consolidate 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 and increase the net number of acres to which the public has access.

Authorizing the facilities, until an opportunity for exchange or sale arises, is in accord with the Taylor Grazing Act and the CFR. Section 4120.3-3(a) of the CFR says a permittee or lessee may apply for a range improvement permit to install management facilities, at their own expense. Section 4 of the Taylor Grazing Act says in part, "Fences, wells, reservoirs, and other improvements necessary to the care and management of the permitted livestock may be constructed on the public lands..."

Alternative C

Administrative Action/Grazing Management:

Removing the livestock management facilities and rehabilitating the site would benefit upland health and increase species biodiversity. Seeding with the appropriate native species would decrease bare ground, reduce wind and water erosion and increase water infiltration efficiently. However, cheatgrass in the pasture adjacent to the fenced livestock paddock would move into the open niche rapidly if cattle impacts were eliminated. Cheatgrass is an early spring, annual, invasive species and would more efficiently utilize early season precipitation and soil nutrients than seeded native cool season perennial grasses and forbs which germinate later in the spring. Pre-treating a larger area to eliminate cheatgrass may be necessary to provide seeded species an opportunity to establish.

Storey Property

Alternative B

Administrative Action/Grazing Management:

Occasional light grazing treatments by cattle, in conjunction with elk winter use, would remove decadent growth from cool season bunch grasses (e.g., bluebunch wheatgrass, Indian ricegrass) stimulate new basal, root, stem and inflorescence growth, production and vigor. Authorizing 141 AUMs of forage for livestock would leave 64% of estimated total herbaceous production for wildlife.

Since cattle grazing would occur on an infrequent basis, forage available on elk winter range and residual cover for small mammals and ground nesting birds would be enhanced. If grazing occurs in the fall, forage available to wintering elk would be reduced for that year. Likewise, if grazing is authorized in the spring and early summer herbaceous cover for ground nesting birds may be reduced during that season. However, if livestock utilization does not exceed 50%, adequate cover should be available.

Approximately 1¼ miles of three-strand barbed wire fence would be installed on the property's north boundary. In addition, two cattle guards and additional jack and rail fence around the boat launch facilities would be needed to prevent cattle from getting out on state Highway 287, or into the recreation area. Constructing fences may create big game entanglement hazards and impede movement through the area. The wildlife-friendly specifications for wire spacing should reduce these threats and allow for passage under the bottom wire and over the top wire.

Resource Concern #3: Recreation and Travel Management

The occasional grazing of cattle would somewhat impede recreational access, causing vehicles to travel more slowly and perhaps slowing the washboarding of the road surface which might reduce the maintenance frequency. Installation of cattle guards at both the highway entrance and the parking area entrance would allow recreational users to access the site without opening and closing gates, but the cattle guards would create a minor annoyance for drivers towing boat trailers.

Alternative C

Administrative Action/Grazing Management:

Although cattle would not be used as an occasional tool for removing decadent grass, the wintering elk that forage along the Madison River would continue to stimulate vegetative regeneration and promote a healthy and vigorous herbaceous plant community. By permanently classifying the Storey Property as unavailable to livestock grazing, all available forage (approximately 309 AUMs) would be available for wintering elk and provide more cover for ground-nesting birds.

Permanently designating the Storey as unavailable to grazing would eliminate the need to build the projects outlined above.

Strawberry Ridge #10421

Alternative B

Administrative Actions/Grazing Management:

Reducing the number of authorized cattle would reduce grazing impacts in the riparian areas and the uplands across the entire allotment. Taking 160 acres of BLM administered land on the northeast allotment boundary out of the allotment, and including it in the Windy Pass allotment, would provide the BLM and grazing lessee the opportunity to manage the time and duration of grazing on lower Antelope Creek tributary in the pasture. The proposed drift fence on the ridge between Cataract and Pony Creeks would keep cattle owned by separate lessees in their respective pastures.

Alternative C

The proposed actions and predicted effects are the same as Alternative B.

Trail Creek C&H AMP #30401

Alternative B

Grazing Management:

Consistent riding would effectively keep cattle off the two BLM pastures (Fall Creek and Trail Creek) when they are scheduled to be on the Forest Service pastures in the allotment. Riding would also preclude stray cows from drifting back down into sensitive riparian areas.

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

Requiring riding to limit use in the Trail Creek and Fall Creek pastures to a maximum of nine days in July (July 1 – 9) and nine days in the fall (September 27 – October 5) every other year is expected to improve riparian habitat along Spring Creek. The short duration of use, followed by a year of rest, is expected to enhance deep rooted riparian species and improve stream bank stability. Sediment input from trailing would be mitigated under this alternative. During rest years impacts to Spring Creek would be limited to one stream crossing as cattle trail up to the Fall Creek pasture, and continue on to their summer pastures on the National Forest.

Alternative C

Grazing Management:

Proposed actions and predicted effects are the same as Alternative B.

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

In addition to the proposals in Alternative B which would also be implemented under Alternative C, removing juniper within 50 feet of Spring Creek and around the Trail Creek Spring would enhance riparian habitat and hydrological processes. Predicted effects would be an increase in deep-rooted riparian vegetation (aspen, willows, red-osier dogwood, sedges), which would be followed by stream channel improvements, increased water storage capability and widening riparian zones. Sediment input into the treated reaches may increase for the first couple of years and then decrease from current levels due to an increase in vegetative cover along the greenline. The increased cover would be more effective at trapping sediment coming from both in-stream and upland sources.

Removing juniper would initially reduce hiding and thermal cover for big game and other wildlife. In the long term, as deciduous riparian species are recruited into the treated areas, cover and forage would be enhanced. Felled juniper would inhibit big game access to treated stream reaches. Riparian woodlands support the highest diversity of landbird species of all habitats, and as removing juniper enhances other riparian species, bird species diversity is expected to increase. For at least some portion of their annual life cycle, about 75% of all wildlife species in this area utilize riparian habitat. Enhancing riparian vegetation and increasing deciduous riparian woodlands would benefit these wildlife species.

Resource Concern #2: Wilderness Characteristics

Spring Creek is the southern boundary of the Bear Trap Canyon Wilderness. Vegetation objectives described within the wilderness management plan say, “Vegetation will be managed to maintain the system of natural processes that governs the distribution of plant communities and to ensure that natural biotic communities remain undisturbed except by those natural processes” (pg. 22).

While the proposed juniper treatment is intended to enhance the riparian zone, and restore certain native vegetative communities, the proposed activity is obviously not a “natural process.” This would contradict the wilderness plan’s stated objective of ensuring that “...natural biotic communities remain undisturbed except by those natural processes. In addition, the Wilderness Act of 1964, the basis of which all wilderness areas are managed, specifically prohibits the use of motorized equipment except in rare circumstances, including emergencies and situations where no other reasonable means of accomplishing necessary work is possible. An evaluation of the proposed means to accomplish this work inside the wilderness area would have to be completed prior to beginning this work. A variety of alternative methods would need to be considered in order to reach a conclusion that the chainsaw might be the “minimum tool” necessary, and whether the proposal would actually benefit the wilderness values.

Of course, outside of the wilderness boundary, on the south side of the creek, junipers could be removed as proposed. There is no buffer zone for the management of wilderness, and although there would likely be some impacts to the wilderness user as a result of this project, it would not be appropriate to evaluate it against the criteria for the management of the wilderness area.

Wall Creek Game Range #00819

Alternative B

Issue #4: Noxious and Invasive Species

Aerial herbicide treatments are expected to reduce large, inaccessible infestations and make future ground treatments more feasible and effective. Only areas of dense populations of spotted knapweed and relatively little native vegetation remaining would be targeted for aerial treatment. Impacts, including mortality would occur on most existing non-target broad leaf plants in the areas treated aurally. However, without treatment these native plants would eventually be eliminated from the plant community from competition and allelopathic effects of spotted knapweed. Overall, herbicide application should enhance the competitive advantage of bunchgrasses, improving forage and cover for wildlife, and increasing cover and composition of native vegetation.

Alternative C

Issue #4: Noxious and Invasive Species

Fencing the cheatgrass restoration project on the Wall Creek Game Range would displace wintering elk from this area, making it unavailable for grazing for a couple of years. However, allowing the cheatgrass infestation to increase or re-infest these areas would not benefit wintering elk and reducing cheatgrass would allow cool season bunchgrasses to increase, improving elk winter range in the long-term.

Wallace Peak AMP #10447

Alternative B

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

Watering troughs are a convenient and preferred water source when available. The proposed development of a spring on state land south of Hot Springs Creek would provide cattle with an off-stream source of water. Decreasing the number of authorized cattle by 34% (166 to 110) would reduce forage consumption in riparian and upland habitat. A 30 day limit in a given pasture, combined with a rest-rotation system-alternating the period of annual use-has been shown to be a successful management strategy for maintaining or improving the physical and biological components of riparian systems (Myers 1989a).

Alternative C

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

In addition to the predicted effects under Alternative B, a three pasture rest-rotation would shorten the total season of authorized use to 60 days. Pastures would be rested every third season (opposed to every fourth under Alt. B) which would accelerate an upward trend in riparian health recovery on streams and in specific areas where concerns have been documented.

Windy Pass AMP #20385

Alternative B

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

Changing the grazing period to two weeks the first year, and limiting use to five days of trailing the second, would alleviate over utilization in the various riparian areas within the allotment. As discussed above under Strawberry Ridge, fences would be constructed to incorporate 160 acres of BLM public land containing lower Antelope Creek tributary (#2046) into the Windy Pass

allotment. The additional fencing would prevent access into the pasture by unauthorized cattle and mitigate stream bank degradation and channel over-widening, down-cutting and excess sediment inputs into the stream. Allowing up to 10 days use each fall in the Gathering pasture would have relatively little impact to the stream banks because soil moisture content would be at a seasonal low making the banks less susceptible to hoof damage. Palatability and protein levels increase in woody species in the fall as they simultaneously decline in grasses, so some herbivory by cattle of woody species may occur. Providing an off stream watering site would reduce the impacts by cattle in the riparian/wetlands area.

Removing private land in the northeast portion of the allotment and maintaining or building fences would protect riparian resources on reach # 664 from unauthorized cattle accessing the allotment from private land north of the allotment. Trailing impacts, sediment inputs and localized channel over-widened would be expected to improve.

Alternative C

Issue #1: Riparian, Wetland, Aquatic Habitat and Associated Species

In addition to the predicted effects under Alternative B, resting the Gathering Pasture every third year would provide riparian plants an opportunity to complete their entire growth cycle. Sedges on the stream banks would trap more sediment during high spring flows, which would contribute to bank stabilization and expansion of and vigor of the riparian vegetation community.

Forest and Woodland Treatments

Alternative B

Allowing the permitted removal of wood products would result in removal of dead and dying trees on up to 569 acres. It is likely that actual harvest and removal of trees would be incidental, and would only occur on a small percentage of this acreage. Where trees are removed, the standing dead component would be reduced, allowing sunlight to reach the forest floor. Establishment of lodgepole pine and/or Douglas-fir regeneration would occur more quickly in areas where trees are removed than in untreated areas. Having treated and untreated areas intermixed would increase horizontal structural diversity, and would break up fuel continuity.

Where permitted removal of wood products occurs in the Strawberry 1 and Charcoal 1 units, fuels adjacent to WUI would be reduced. In the event of a wildfire, this would lessen fire intensity and potentially allow fire managers a greater range of fire management opportunities.

Implementing commercial harvest in the Preacher 1 and Preacher 2 units (up to 180 acres) would open up the stands and increase the vigor of leave trees. Douglas-fir beetle and spruce budworm hazard would be reduced. The residual stand would be more likely to survive attack by insects, and would exhibit less mortality than untreated areas during epidemic insect populations. Removing conifers from within and around aspen stands would improve the vigor of existing aspen by making more sunlight, water, and nutrients available.

Roads constructed for Preacher 1 and Preacher 2 would be temporary and therefore would not lead to increased wildlife disturbance from improved motorized vehicle access in the long-term. The construction of roads for timber harvest is a common concern for grizzly bears. Since these temporary roads would be closed, there would most likely be no effect on grizzlies. Though

grizzly bears are considered transient in the Tobacco Root Mountains, they may occupy the area in the future. The food storage stipulation required in timber sale contracts (as per section 2.3.3) would mitigate the potential for grizzly conflicts.

Constructing a hardened crossing on Cataract Creek to access firewood cutting unit Cataract 1 would have minimal effects on the fishery. There is likely to be short term increases in sediment during the periods that the road would be open for use. This could result in a slight impact to early spawning brook trout if they locate redds in the reach downstream from the crossing. However, with the periods proposed for use and the crossing location there would not likely be much, if any, affect on the fish population overall. If properly constructed, the hardened crossing would likely reduce the amount of sediment currently entering the stream from this location as a result of a more stable road surface.

Allowing the use of mechanized equipment in the Permitted Removal and Commercial Harvest units has the potential to cause soil disturbance, and introduce or spread noxious and invasive weeds. Design features which require power washing equipment before being used off-road, along with monitoring and treating weeds if found, would reduce the likelihood of noxious and invasive species becoming established or getting spread as a result of this activity. Commercial harvest treatments in the Preacher 1 and Preacher 2 units would be mostly done with cable yarding, which results in less soil disturbance than tractor yarding because at least one end of the log is suspended while yarding. All Permitted Removal and Commercial Harvest units proposed in Alternative B are in soil types with medium hazard of runoff, and moderate hazard of water erosion (Boast and Shelito, 1989).

Fuels reduction treatments in the Aspen Creek unit, adjacent to the Sun West Ranch subdivision, would utilize prescribed fire and non-commercial mechanical and/or manual methods on up to 350 acres. Treatment within and around existing aspen stands would maintain/improve aspen by removing conifers, thereby reducing shading, competition, and the conifer seed source for regeneration. Treatment would have some benefits associated with protecting WUI from the threat of wildfire. One of the primary benefits of reducing fuel loads are to decrease the intensity of potential wildfire, thus offering fire managers and firefighters more opportunity for direct fire suppression or other appropriate response. Promoting an aspen vegetation community rather than a conifer dominated vegetation community would, in the event of a wildfire, offer a greater range of fire management opportunities. These benefits would prove effective until fuel loads reach pretreatment levels. This may be up to 30 years, depending on other disturbances that affect fuels loads (i.e. wildland fire, insects/disease outbreaks, windthrow).

The Aspen Creek unit is within an elk calving area. Activity would not be permitted between 5/15 and 6/30, which would mitigate disturbance to elk calving. The objective of the non-commercial mechanical/prescribed fire treatment to promote and maintain aspen stands and meadows enhances habitat for a diversity of bird and wildlife species. This treatment is beneficial for elk calving since elk tend to calve in open sagebrush parks or meadows, near the forest edge.

The Windy 1, Windy 2, Cataract 1, Preacher 1, and Aspen Creek units are all within elk winter range. Although these units are not critical elk winter range, wintering elk may be disturbed if

harvest activity is occurring between 12/01 and 4/30 in these units. Harvesting of trees would reduce big game hiding and thermal cover in the short-term. Wildlife seeking cover would be displaced from these units until regeneration occurs. Considering that the trees surrounding this area are dead and dying, as discussed under *Predicted Effects Common to All Action Alternatives*, harvesting the trees opens the canopy and facilitates regeneration sooner, providing hiding and thermal cover in an area surrounded by standing dead trees and/or deadfall in the long-term. In the interim between harvest and tree regeneration, herbaceous and shrub cover would provide wildlife habitat, including forage for big game.

All of the proposed forest and woodland treatments would initially reduce big game cover and cause disturbance during implementation, pushing wildlife out of the area. In the long-term, the open forest canopy would increase the amount of herbaceous and shrub forage for moose, elk, and deer. Additional wildlife impacts of forest and woodland treatments are discussed under sections 4.2.1 *Predicted Effects Common to All Alternatives, Including the No Action*, 4.2.2 *Predicted Effects of Alternative A - No Action*, and 4.2.3 *Predicted Effects Common to All Action Alternatives*.

Alternative C

Allowing the permitted removal of wood products would result in removal of dead and dying trees on up to 375 acres. It is likely that actual harvest and removal of trees would be incidental, and would only occur on a small percentage of this acreage. Effects of completing this treatment would be the same as described under Alternative B, but would occur on less total acreage. Effects to WUI from permitted removal would be the same as described under Alternative B.

Alternative C would implement commercial harvest on up to 659 acres. Effects of harvesting the Preacher 1 and Preacher 2 units, and effects of temporary road construction associated with treatment, would be the same as described under Alternative B. In the Willow 1 and Windy 3 units, commercial harvest would remove dead/dying lodgepole pine, and thin Douglas-fir to leave healthy Douglas-fir of all size classes. Scattered patches of uncut timber, healthy spruce and five needle pines, and a minimum of two to five snags per acre would be left throughout the treatment units. Post-harvest, the residual stands would be patchy, with dense uncut patches, open areas with scattered mature trees, and thinned areas with trees of various sizes. Opening up the stands through this harvest would increase the vigor of leave trees, and increase their growth rate by reducing competition for moisture and nutrients. Douglas-fir beetle and spruce budworm hazard would be reduced. The residual stand would be more likely to survive attack by insects, and would exhibit less mortality than untreated areas during epidemic insect populations. The treatment would increase the vertical and horizontal structural diversity within the units. Where aspen occur in these units, removing conifers from within and around aspen stands would improve the vigor of existing aspen by making more sunlight, water, and nutrients available.

Alternative C would also implement a combination of commercial harvest and non-commercial mechanical/prescribed fire treatment on up to 350 acres in the Aspen Creek unit. Where commercial harvest occurs, the majority of the overstory canopy would be removed. Seedling and sapling regeneration would be left, leaving a stand of patchy regeneration of mostly Douglas-fir, with subalpine fir, Engelmann spruce, and lodgepole pine. Harvesting overstory lodgepole pine and allowing the stand to regenerate would create a mosaic of age and size

classes on the larger landscape, reducing the total area that would become infested by mountain pine beetle in the future. In addition, implementing a silvicultural prescription that favors species not susceptible to mountain pine beetle (e.g. Douglas-fir) would result in greater stocking when another beetle outbreak occurs. Where possible, partial cutting completed in lodgepole pine stands is expected to reduce mountain pine beetle behavior by altering the stand microclimate which affects beetle behavior (Amman and Schmitz, 1988). The increased air currents in thinned stands hinder the beetle's ability to communicate and mass attack trees. However, areas of partial cutting would be limited, because extensive thinning of lodgepole pine stands often results in windthrow (Colorado State Forest Service, 2009).

The predicted effects of non-commercial mechanical/prescribed fire in Aspen Creek would be the same as described under Alternative B. However, including commercial timber harvest in Alternative C would further reduce fuels near the Sun West subdivision, as compared to the strictly non-commercial mechanical/prescribed fire treatment. The increase in sunlight that reaches the ground following harvest, and the slight ground disturbance caused by harvest operations, would further stimulate lodgepole pine and aspen regeneration. The initial successional stages (of lodgepole pine) generally do not carry crown fire as readily as older stages (Anderson, 2003), and aspen stands commonly resist surface fire spread.

Roads constructed for the Preacher 1, Preacher 2, Windy 3, and Aspen Creek units would be temporary and therefore would not lead to increased wildlife disturbance from improved motorized vehicle access in the long-term. The construction of roads for timber harvest is a common concern for grizzly bears. Since these temporary roads would be closed, there would most likely be no effect on grizzlies. Though grizzly bears are considered transient in the Tobacco Root Mountains, they may occupy the area in the future. Grizzlies are resident in the Gravelly Range. The food storage stipulation required in timber sale contracts (as per section 2.3.3) would mitigate the potential for grizzly conflicts.

One new stream crossing on a tributary of Antelope Creek (reach # 664) may be necessary to access the Windy 3 commercial harvest unit. This crossing would be a culvert, properly sized and installed. Stream dimensions, patterns and profiles would be maintained and the Antelope Creek would neither aggrade nor degrade as a result of a properly designed, sized and installed culvert. Short term impacts during installation of the culvert would include sedimentation and vegetation disturbance on a localized basis.

The Madison County Soil Survey indicates that the soils in the approximate area identified for installation of a temporary culvert have rapid runoff, and the hazard for water erosion is high (Boast and Shelito, 1989). Proper sizing and installation would mitigate the risk associated with these soil conditions.

Allowing the use of mechanized equipment in the Permitted Removal and Commercial Harvest units has the potential to cause soil disturbance, and introduce or spread noxious and invasive weeds. Design features which require power washing equipment before being used off-road, along with monitoring and treating weeds if found, would reduce the likelihood of noxious and invasive species becoming established or getting spread as a result of this activity. Commercial harvest treatments in the Preacher 1, Preacher 2, Willow 1, and Windy 3 units would be mostly done with cable yarding, which results in less soil disturbance than tractor yarding because at

least one end of the log is suspended while yarding. Commercial harvest treatment in Aspen Creek would utilize tractor yarding, which has a greater potential to cause soil disturbance. However, the terrain in this unit is gentle (0-20% slope), and the soil type does not have a high hazard for runoff or water erosion (Boast and Shelito, 1989).

The Aspen Creek unit is within an elk calving area. Activity would not be permitted between 5/15 and 6/30, which would mitigate disturbance to elk calving. Elk tend to calve in open sagebrush parks and meadows near the forest edge. Thermal and hiding cover for calves would be removed in this unit. Calving grounds immediately north of this timber unit would retain forest cover and aspen cover would also remain. Considering that the trees surrounding this area are dead and dying, in the long-term this unit may contain the only cover without excessive deadfall. The non-commercial mechanical/prescribed fire treatment would benefit elk calving habitat by promoting aspen cover and maintenance of meadows.

The Willow 1, Windy 3, Cataract 1, Aspen Creek, and Preacher 1 units are all within elk winter range. Although these units are not critical elk winter range, wintering elk may be disturbed if harvest activity is occurring between 12/01 and 4/30 in these units. Harvesting of trees will reduce big game hiding and thermal cover in the short-term. Wildlife seeking cover will be displaced from these units until regeneration occurs. Considering that the trees surrounding this area are dead and dying, as discussed under *4.2.3 Predicted Effects Common to All Action Alternatives*, harvesting the trees opens the canopy and facilitates regeneration sooner, providing hiding and thermal cover in an area surrounded by standing dead trees and/or deadfall in the long-term. In the interim between harvest and tree regeneration, herbaceous and shrub cover will provide wildlife habitat, including forage for big game.

Alternative C would implement up to 1785 acres of non-commercial mechanical/prescribed fire treatment in the Preacher 3 unit. Completing this treatment would slow or reverse the conversion of affected sagebrush/grasslands into forested habitat. The Preacher 3 unit contains elk and mule deer winter range. Prescribed burns may occur as early as March, which may disrupt big game on winter range. However, the burns will be patchy and won't cover the entire area, although wildlife will be pushed out of the area during implementation. Adequate winter range surrounds the unit if big game is pushed out of the area during implementation. Forage for big game will improve following prescribed fire, enhancing winter range in the long-term. Removing conifer encroachment will also benefit sagebrush habitat for sagebrush obligate species.

All of the proposed forest and woodland treatments would initially reduce big game cover and cause disturbance during implementation, pushing wildlife out of the area. In the long-term, forage for moose, elk, and deer would improve with an increase in herbaceous vegetation and shrubs as the canopy is opened. Additional wildlife impacts of forest and woodland treatments are discussed under sections *4.2.1 Predicted Effects Common to All Alternatives, Including the No Action*, *4.2.2 Predicted Effects of Alternative A - No Action*, and *4.2.3 Predicted Effects Common to All Action Alternatives*.

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 is defined as all land, regardless of ownership, in the MW assessment area (map 1). Some past, present and reasonably foreseeable actions are discussed in Chapter 3 (Affected Environment) and/or Chapter 2 (Features Common to all Alternatives).

4.3.1 Past and Present Actions

Past or ongoing actions that are common to all alternatives and affect the same components of the environment as the proposed actions 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, 1999; Naiman, 1988). Although there are still active beaver colonies in the Madison Watershed, activity is substantially reduced from historical levels.

In the late 1890's and early 1900s, wolves and other large predators in the western United States were hunted, trapped and poisoned nearly to extinction. Ripple and Beschta (2005) indicate that the presence of top trophic level predators significantly affects herbivores and that this interaction alters or influences vegetation (aspen, willow, cottonwood).

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, 2004).

Whitebark pine is declining rapidly across many parts of its range due to the combined effects of the exotic white pine blister rust, the native mountain pine beetle, and the exclusion of fires (Arno 1986; Kendall and Keane 2000; Tomback et al. 2001).

Exclusion of fire from the landscape i.e., 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 altered forest conditions.

Moose numbers are down throughout MFWP Region 3, with parasites as a primary concern. Elk populations in southwest Montana have increased over the past 20-25 years, and numbers are within objectives in the Madison Watershed.

Impacts on lands upstream from BLM administered land may contribute sediment to streams and subsequently may adversely affect downstream water quality on public land.

Road use and maintenance adjacent to or crossing streams have impacted some streams in the watershed by adding sediments and/or removing vegetation at the crossing or adjacent to the stream.

Roads in the uplands allow opportunities for noxious and invasive weeds to become established and in isolated areas (steep slopes) contribute to soil erosion.

Increased recreation has adversely impacted isolated areas within the watershed (camp sites, new trails and roads, spreading of weed seed, etc.).

Approximately 96 acres of commercial timber harvest has occurred on forested BLM-administered lands in the past 30 years. Approximately 15 acres of commercial timber harvest has occurred on State of Montana lands in the MW during the past 30 years. The total estimated forested area treated on USFS-administered lands in the past 40 years is approximately 17,500 acres across the watershed. Silvicultural treatments include, but are not limited to: salvage harvest, sanitation harvest, shelterwood harvest, seed tree cut, clearcut, group selection cut, single tree selection cut, commercial thin, and pre-commercial thin. An unknown acreage of timber harvest has occurred on private lands, primarily in the Windy Pass and Aspen Creek allotments. There has been timber harvest, pole cutting, Christmas tree cutting, and firewood collecting in the past throughout the watershed.

Historic mining in the MW has resulted in visual, water quality, and habitat changes. Riparian and upland habitats have been impacted directly and indirectly across all ownerships.

Introduction of non- native sport fish in the early-mid 1900's has resulted in the loss of nearly all populations of native WCT within the Madison River drainage. Construction of the Ennis Lake and Hebgen Dams and changes to river morphology were the primary factors in the loss of fluvial arctic grayling in the Madison River.

Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions that would cumulatively affect the same resources in the cumulative impact area as the proposed actions and alternatives are:

The risk of wildfire on all ownerships will continue. Fire management actions will continue on federally-administered lands in the watershed.

The Forest Service is planning a fuels reduction treatment in the North Meadow Creek drainage. This project includes up to 300 acres of timber harvest and up to 700 acres of prescribed fire, to protect the WUI in this area.

An estimated 470 acres of private land adjacent to proposed forest health treatments may be harvested in conjunction with Alternative B. An estimated 700 acres of private land adjacent to proposed forest health treatments may be harvested in conjunction with Alternative C.

Impacts resulting from grazing, vegetative projects and/or recreation on private and State lands, which are not subject to BLM Standards, would continue. This could impact 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 remain consistent.

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 and fishing, is expected to increase in the MW 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 BLM expects only minor changes-likely positive-with regard to impacts to climate from actions implemented by the BLM. 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 15 year period. 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 Basin and mountain big sagebrush habitat through Douglas-fir or juniper expansion can be anticipated. In areas that are treated to remove competing conifers, the seral stage of sagebrush would be set back to early seral and would take about 30 years to progress back to late seral. This creates seral and structural diversity within sagebrush habitats across the landscape.

The economic situation of the lessees is affected by changes in cattle 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 could influence grazing lessees to subdivide private land to maintain economic viability. Substantial sub-dividing of private land within the watershed is expected to continue or increase in the foreseeable future. Land use patterns on private and public lands in Madison County are changing. As traditional agricultural lands are converted to residential and recreational properties fewer large scale ranching operations remain. Access to public land across private land is becoming more restricted and will likely continue as traditional ranches are subdivided into smaller parcels.

If funding and project expansion allow, partner with the O'Dell Creek wetlands restoration project on BLM lands along the Madison River. This would involve restoring irrigation ditches to stream channels and wetlands for fish and wildlife habitat.

Several streams within the MW offer a high potential for re-establishment of native WCT. Cooperative effort between the State, FS and BLM could potentially re-establish WCT

populations on Arasta, Buffalo, Wigwam and Warm Springs Creeks without affecting local sport fishing opportunities.

4.3.2 Cumulative Effects of All Alternatives, Including the No Action

The removal of large predators in the western United States in the late 1890s/early 1900s increased the level of impact that elk and moose had on riparian areas and aspen. The reintroduction of wolves into Yellowstone National Park in 1995 and subsequent increase in wolf numbers in southwest Montana may have an effect on reversing these impacts.

Restricted habitat and a small isolated population will continue to place arctic grayling within the MW at high risk of extinction.

As traditional agricultural lands are converted to residential and recreational properties fewer large scale ranching operations remain in the Madison Valley. The number of cattle grazing BLM administered public land in the MW will correlate to further decreases in private land based ranching operations within the watershed area.

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.

Development and population growth in the MW will continue to cause wildlife habitat fragmentation (roads, utilities), increasing vehicle traffic and other human uses, increased weed spread, less open space, increased demand for outdoor recreation, increased conflict between user groups on public land, increased difficulty in obtaining access to some public land, and perhaps an increased demand for water.

Large scale mortality of trees across forested portions of the MW on all ownerships may result in increased annual stream flow, and changes in the timing of water delivery due to reduced water uptake by trees, and reduced interception of precipitation with the loss of canopy (Colorado State Forest Service, 2009).

High probability habitats will be surveyed for sensitive plants prior to any ground disturbing activities on federal land but botanical surveys aren't required on private and state lands even on cooperative projects (e.g. a pipeline that crosses multiple-ownership).

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

Without grazing management changes and new range improvement projects cattle induced riparian health concerns identified in the MW Assessment Report would not be addressed and objectives for improving riparian health would not be accomplished. Downward trends would continue on stream reaches in seven grazing allotments which could affect riparian health, fisheries habitat and/or water quality downstream from BLM administered lands.

The loss of whitebark pine habitat has landscape-level ecological consequences, including decline of biodiversity, alteration of successional pathways, changes in distribution of subalpine vegetation, and increased rates of snowmelt in high elevation areas (Tomback et al, 2001). This would also effect grizzly bear populations as this major food which the species depends on declines.

4.3.4 Cumulative Effects All Action Alternatives

The proposed changes in livestock management would generally improve riparian function on BLM-administered land and other lands (private, state) within BLM allotments at varying degrees and timeframes. The expected effect to downstream riparian habitats and water quality would be improved sediment transport, better access to floodplains, dissipation of energy and, over time, improvements in channel morphology. The effects of implementation of the selected alternative would be quantitatively determined by monitoring physical and vegetative indicators of riparian and upland function, and monitoring vegetative components of habitat.

Forest health treatments completed on BLM-administered lands and other ownerships would increase the diversity of forest structure and composition throughout the MW. This increase in structural diversity across the landscape would likely result in a more patchy spruce budworm outbreak regime in the future (Swetnam and Lynch, 1989). Treatment in lodgepole pine to remove bark beetle infested trees and promote regeneration of a new stand would result in patches of lodgepole pine across the landscape that would be resistant to mountain pine beetle for up to 80 years (Mata et al, 2003). Increasing structural and compositional diversity across the landscape as a result of forest and mechanical treatments decreases the probability of large-scale disturbances that produces widespread negative impacts. Large-scale disturbances would still have the potential to occur; however, areas treated would create buffers of less susceptible (in terms of insects/disease) and more fire resilient habitats.

Since whitebark pine seeds are a food source for a variety of wildlife species including grizzly bears, actions to maintain or enhance whitebark pine would also enhance an important wildlife habitat component. Maintaining/enhancing whitebark pine habitat on BLM administered lands would sustain connectivity to other whitebark habitats in the Greater Yellowstone Ecosystem and beyond.

The implementation of the land health standards, site specific rangeland improvements, and site-specific mitigation would maintain or improve vegetative composition, diversity, vigor and cover, maintain or restore soil function and limit bank disturbance and associated soil loss where these concerns were noted. As areas not meeting the land health standards move towards proper functioning condition, the BLM anticipates an increase in vegetative cover, a reduction in bare ground, soil compaction, and soil erosion and an increase in bank stability.

The implementation of the selected alternative would maintain or restore 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 Dillon Field Office reduced livestock use from 2002 through 2005 in response to drought conditions to protect resources

during the drought. 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.

If fewer AUMs were authorized on BLM-administered lands, livestock would have to be pastured elsewhere for part of the grazing season or the herd size may have to be reduced. Reducing authorized AUMs may increase livestock use on private property adjacent to or near public lands. When viewing the watershed as a whole, this may directly affect similar resources on private property and offset the benefits to public land. If private livestock numbers were permanently reduced, a decrease in Madison County tax revenues may result.

Depending on which alternative is selected, between eight and 10 miles of new fence is proposed to be constructed in the MVHP, North Morgan, McAtee Bridge and Bar Seven allotments and the Storey Property. Nearly four miles of fences at the MVHP and Storey Property were removed during 2009 and, depending on the alternative selected, more fences are proposed for removal in this area. Overall, the amount proposed for construction and removal are comparable.

It's possible that sensitive plant species could be accidentally or inadvertently impacted by construction or placement of range improvement projects on non-federal lands. Indiscriminate or random placement of livestock supplements could also cause impacts to individual plants or populations across all ownerships.

As recreational use in the MW, especially along the Madison River, continues to increase, the threat of new aquatic invasive species entering the area will remain high. Education of fishermen, boater and other recreationists remains the primary way to reduce the risk. A cooperative effort between federal state and local authorities will be required to prevent the establishment of new species.

Slightly increased labor costs are assumed under Alternatives B and C to implement and check the allowable use grazing guidelines. During drought periods, total authorized AUMs may not be available. All reduced AUMs would be held in suspended non-use on the Term Grazing Leases.

If the Sitz allotment is exchanged for private property of similar value, the tax impact would be neutral. However, an exchange would benefit the general public by increased access and recreational opportunities on the public lands which would be aquired.

4.3.5 Cumulative Effects of Alternatives B

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. Because many allotments within the MW are intermingled with state and private lands, improvements to resource conditions resulting from management changes and projects would produce benefit across all ownerships. Impacts resulting from grazing, vegetative projects and/or recreation on private and State lands, which

are not subject to BLM Standards, would continue. This could impact 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.

Managing for more vigorous and productive cool season grasses by changing the frequency, timing, duration and/or intensity of livestock grazing on specific allotments would leave more cover and forage for wildlife species and may slightly change patterns of use in specific areas within the watershed. Additional off-site watering locations would better disperse ungulate use in specific areas within the watershed.

No additive or cumulative effects are expected for special status plants under this alternative.

Socioeconomic impacts to livestock operators other than those discussed above are not expected.

The cumulative effects for recreation, wilderness, and visual resources of future actions on private or state lands would be similar to the effects discussed in Section 4.2.4. The nature and scale of these activities would vary according to the objectives of the landowners or administrators.

4.3.6 Cumulative Effects of Alternatives C

Impacts in addition to those described under section 4.2.4 and 4.2.5 are not expected. The investment in projects is similar to that in Alternative B. Alternative C, generally, contains more intensive management practices and/or more structural projects to help mitigate resource concerns.

Impacts resulting from grazing, timber harvest and/or recreation on private and State lands, which are not subject to BLM Standards, would continue. This could impact wildlife migration and dispersal depending on timber harvests planned on State and private lands in the future. Any reductions in authorized AUMs on BLM lands would increase grazing pressure on private and state lands within the watershed.

Chapter 5

5.0 List of Preparers - Consultation/Coordination

5.1 List of Preparers

Core IDT members:

David Early, IDT lead, Rangeland Management Specialist
Kipper Blotkamp, Fuels Specialist
Paul Hutchinson, Fisheries Biologist
Steve Armiger, Hydrologist/Riparian Coordinator
Pat Fosse, Assistant Field Manager for Renewable Resources
Katie Benzel, Wildlife Biologist
Aly Piwowar, Forester

Support IDT members:

Laurie Blinn, GIS Specialist
Jason Strahl, Archaeologist
Michael Mooney, Weeds Specialist
Brian Hockett, TES-plants
Brian Thrift, TES-plants
Bob Gunderson, Geologist/Mining
Rick Waldrup, Recreation Planer

Other Support Personnel

Steve Lubinski, Range Technician
Kelly Urresti, Range Technician
Mary Koerner, Range Technician
Jordan Wells, Range Technician
Lindsay Wilsey, Range Technician
Roger Olson, Range SCEP
Kate Given, Administrative Assistant
Ellen Daugherty, Administrative Assistant
Floyd Thompson, Range Program Lead MT/Dakotas
Alison Kailey, Forestry Technician

5.2 Consultation/Coordination

5.2.1 Persons and Agencies Consulted

Bob Brannon	Wildlife Biologist MTFWP
Kevin Frey	Wildlife Management Specialist MTFWP
Katrina Dixon	USFWS
Julie Cunningham	Wildlife Biologist MTFWP
Pat Clancy	Fisheries Biologist MTFWP
Jim Magee	Fisheries Biologist MTFWP

Darin Watschke	Fisheries Biologist USFS-Ennis
Rob Gump	Silviculturist USFS-Beaverhead-Deerlodge
Curt Tesmer	Forester DNRC-Bozeman
Sunny Heikes-Knapton	Madison Watershed Coordinator
Bob Sitz	Sitz Angus Ranch, Harrison, MT
Brian Ohs and Wayne Wilson	Ohs, Karl Ranch LLC, Pony, MT
Gerald Ohs	Gerald Ohs Ranch, Pony, MT
Jerry and Karletta Bausch	Bausch Ranch, Norris, MT
Stephen Jackson	Jackson Ranch, Norris, MT
Jerry Brush	Rancher, Norris, MT
Darren Locke	Manager, Windy Water Ranch, McAllister, MT
George Boyd	Manager, Bar Seven Ranch, Ennis, MT
John Craft	Manager, Bar K Ranch, Cameron, MT
Pete Olind and Lisa Surber	Montana Experimental Station (MSU)
Todd Durham	Rancher, Cameron, MT
David Klatt	Early Springs Ranch, West Yellowstone, MT
James Roland Moore	Cold Springs Ranch, Norris, MT
Gary Gustin	Rancher, Ennis, MT
Mike Thibeault	Sun West Ranch
Eugene and Lois Walsh	Rancher, Cameron, MT
Fred Rentschler	Corral Creek Ranch, Cameron, MT

5.2.2 Notifications

Assessment Initiation Notice; Madison mailing list – June, 2009
 Media Release; Assessment Initiation Notice – June, 2009
 Internet NEPA Log – Dillon Field Office – June, 2009
 Media Release; Assessment Completion and EA Initiation Notice – January, 2010
 Montana/Dakotas External Website - Assessment Report – January, 2010
 Montana/Dakota External Website – Executive’s Summary and Authorized Determination – 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.

5.3 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.

adaptive management: Management in which monitoring measures progress toward or success at meeting an objective and provides the evidence for management change or continuation. In practice, most monitoring measures the change or condition of the resource; if objectives are being met, management is considered effective.

aggrade: Aggradation involves the raising of the streambed elevation, an increase in width/depth ratio, and a corresponding decrease in channel capacity. Aggradation can be a result of

instability caused by over-widening of the channel with a resultant decrease in stream power and shear stress.

allelopathy: Release of substance by a plant that typically inhibits the germination or growth of another plant.

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).

authorized 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.

bankfull discharge: A frequently occurring peak flow whose stage represents the incipient point of flooding, often associated with a return period of 1-2 years, with an average of 1.5 years.

basal area: The cross-sectional area (in square feet at diameter at breast height) of all tree stems, expressed on a per-acre basis; a measurement used to express stand density.

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.

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.

DBH: Diameter at Breast Height: the diameter measurement of a tree at 4 ½ feet above the ground, on the uphill side of the tree.

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.

floodprone area width: The width of the channel associated with the elevation that is twice the bankfull depth.

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.

greenline: The first perennial vegetation that forms a lineal grouping of community types on or near the water's edge. Most often it occurs at or slightly below the bankfull stage.

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

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

herbivore: a plant eating animal

herbivory: the act of feeding on plants by an herbivore

historical range of variation (HRV): The "HRV" concept refers to the expected variation in physical and biological conditions caused by natural climatic fluctuations and disturbance regimes (i.e. flooding, fire and windthrow). HRV is derived from an ecological history of the landscape and is estimated from the rate and extent of change in selected physical and biological variables. For example, in the Douglas-fir forest, HRV was determined by looking at existing fire scar evidence which indicated one to several fire events during the life of the older to oldest trees. The relatively uniform age groups of younger trees found in the direct vicinity of older fire scarred trees that have seeded in and grown since the last major historical fire disturbance event(s) also indicate a lack of fire in recent history.

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.

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.

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.

landing: A place in or near the harvest area where felled timber or logs are gathered for further processing or transport.

lentic: Standing water riparian-wetland areas such as lakes, ponds, seeps, bogs, and meadows.

lotic: running water riparian-wetland areas such as rivers, streams and springs

mean bankfull depth: the mean depth of flow at the bankfull stage

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)

overstory: The canopy or upper layer of the habitat zone. This is generally referred to as the mature tree crowns of a forested habitat, but is also applied to uppermost layer of foliage in shrub dominated habitats.

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)

Resource Reserve Allotment: A unit of public land that will not have term grazing permits issued. Such an allotment would only be grazed on a temporary nonrenewable basis. The use of these allotments would be to provide temporary grazing to rest other areas following wildfire, habitat treatments, or to allow for more rapid attainment of rangeland health. The allotment must be of sufficient size to be managed as a discrete unit.

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.

salvage harvest: the cutting and removal of dead or dying timber resources.

sanitation harvest: the cutting and removal of diseased trees or trees damaged by stress or mechanical agents such as insects or wind.

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.

stoloniferous: plant development by the production of stolons which give rise to vegetative spread.

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.

yarding: The hauling of felled timber or logs from the harvest area to a central loading area or landing.

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