Dillon Field Office

Blacktail Watershed Environmental Assessment
MT-050-06-10

Blacktail Mountains, May 2006

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1.0 Purpose of and Need for the Proposed Action

1.1 Introduction and Background

The Blacktail Watershed (BTW) is located in Beaverhead and Madison Counties, Montana and drains portions of the Blacktail and Sweetwater mountain ranges. The BTW lies within Townships 8-13 South and Ranges 4-8 West, Montana Principal Meridian.

The BTW covers public lands administered by the Bureau of Land Management (BLM) from Dillon, MT south to Clover Divide. The BTW boundary, shown on Map A, follows grazing allotment boundaries and includes some allotments that are only partially within the watershed. Technically, the assessed area is not a distinct watershed. Watersheds are defined, and designated on maps, by natural topographical boundaries (ie. ridgelines/ drainages). Grazing allotment boundaries are determined by land ownership and these artificial boundaries may not follow topographical features. Therefore, some of the grazing allotments in the BTW falls within one or more watersheds or hydrologic units.

Within the BTW there are approximately 275,318 total acres of land, of which 63,261 are public lands administered by the BLM. Of this total, 53,100 acres are allotted for grazing, 6,088 acres are unleased and 4,073 acres are unallotted.

In 2006, a BLM interdisciplinary (ID) team assessed the land health of BLM administered land in the BTW. The ID team assessed the following 5 Rangeland (Land) Health Standards: Upland Health, Riparian Health, Water Quality, Air Quality, and providing for Biodiversity. The Watershed Assessment reported the condition/function of resources within the assessment area to the Authorized Officer. The Authorized Officer considered the Assessment Report to determine whether Land Health Standards (Standards) were met, and then signed a Determination of Standards documenting where Standards were or were not met. The Assessment Report and associated Determination of Standards for the BTW were completed and released to the public in January, 2007, and are available at the Dillon Field Office or can be accessed online at http://www.blm.gov/mt/st/en/fo/dillon_field_office.html

The assessed condition/function and recommendations in the Assessment Report and Determination of Standards, along with comments received through public scoping, have been used to develop alternatives to initiate progress towards Proper Functioning Condition (PFC) and address site specific resource concerns where needed. This Environmental Assesment (EA) was completed in accordance with established procedures to analyze and implement area, allotment or site specific changes.

By working on a watershed basis, a broader landscape is considered and more consistent management can be applied. It is the BLM's intent to implement watershed management cooperatively. Changes in management will be implemented through the BLM's decision process.

1.2 Purpose of the Proposed Action

The BLM Dillon Field Office proposes to improve land health and enhance biodiversity in the BTW. Land health would be improved on public lands within the BTW by:

- Restoring/maintaining riparian, wetland and aquatic habitats (vegetation composition, structure, streambank stability, channel morphology) through revised livestock grazing management, structural projects, vegetative treatments, working cooperatively with Montana Fish, Wildlife and Parks (FWP) on wildlife management and improved road maintenance practices.

- Restoring/maintaining upland health and sagebrush habitats (species composition and structure) through revised livestock grazing management, structural projects and vegetative treatments.

This EA analyzes livestock grazing management revisions in addition to travel management, recreation and wilderness opportunities and wildlife resources. Livestock grazing management revisions will be considered on the following seven allotments and the unleased stock driveway:

1. Blacktail Road Trail
2. Spring Brook
3. Sweetwater AMP
4. Red Canyon
5. Sweetwater Basin
6. Timber Creek
7. Spring Brook Isolated
8. Stock Driveway (unleased)

1.3 Need for the Action

The Fundamentals of Rangeland Health and subsequent Land Health Standards require the BLM to initiate management actions that ensure, "Watersheds are in, or are making significant progress toward, properly functioning condition, including their upland, riparian-wetland, and aquatic components…" (43 CFR 4180.1 (a)), if an assessment determines one or more of the Land Health Standards are not being met. In the Blacktail Watershed Assessment Report, the ID team described several causal factors combining to negatively impact the biological, physical, and ecological processes in the watershed. As a result, the Authorized Officer determined that one or more of the Standards are not met in seven of the 20 allotments assessed and the unleased Stock Driveway. Table 1. lists the 20 allotments as well as the unleased and unallotted parcels and shows the determination of each standard by allotment.

Table 1. Determination of Standards by Allotment

Allotment Name, Number, Category & BLM acres	Are Healthy Rangelands Standards Being Met?				
	Upland	Riparian/ Wetland	Water Quality	Air Quality	Bio-diversity
Blacktail Road Trailing 30603 (I) Acres: 484	YES	NO	NO	YES	NO
Blacktail Ridge AMP 10147 (I) Acres: 5434	YES	YES	1	YES	YES

Allotment Name, Number, Category & BLM acres	Are Healthy Rangelands Standards Being Met?				
	Upland	Riparian/ Wetland	Water Quality	Air Quality	Bio-diversity
Kent-Non AMP 20625(I) Acres: 796	YES	YES	1	YES	YES
Robb Creek AMP 20167 (I) Acres: 6025	YES	YES	1	YES	YES
Rock Creek 10512 (I) Acres: 5191	YES	NA	NA	YES	YES
Spring Brook 10516 (I) Acres: 6329	NO	NO	1	YES	NO
Sweetwater AMP 10471 (I) Acres: 12178	YES	NO	1	YES	NO
Red Canyon 00113 (M) Acres: 812	YES	NO	1	YES	YES
Sweetwater Basin 10518 (M) Acres: 1347	YES	NO	1	YES	YES
Timber Creek AMP 10533 (M) Acres: 3591	YES	NO	1	YES	YES
Anderson 20105 (C) Acres: 38	YES	NA	NA	YES	YES
Axes Canyon 10535 (C) Acres: 833	YES	NA	NA	YES	YES
Bench Field SGC 20690 (C) Acres: 2943	YES	YES	1	YES	YES
Red Canyon Iso. 10517 (C) Acres: 812	YES	YES	1	YES	YES
Robb Crk. Non- AMP 20631 (C) Acres: 747	YES	YES	1	YES	YES
Spring Brook Iso. 30677 (C) Acres: 1701	YES	NO	NO	YES	NO
Spear Place 10528(C) Acres: 317	YES	YES	1	YES	YES
Sweetwater Iso. 20666 (C) Acres: 291	YES	NA	NA	YES	YES
Timber Crk. Iso. 10681 (C) Acres: 68	YES	YES	1	YES	YES

Allotment Name, Number, Category & BLM acres	Are Healthy Rangelands Standards Being Met?				
	Upland	Riparian/ Wetland	Water Quality	Air Quality	Bio-diversity
Wire Field SGC 20656 (C) Acres: 1732	YES	NA	NA	YES	YES
Stock Driveway and other unleased 9999 Acres: 6276	YES	NO	1	YES	NO
Unallotted Acres: 4172	YES	YES	1	YES	YES

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

1.4.1 Scope

The scope of the proposed action includes implementing specific use of herbaceous vegetation through authorizing livestock management and implementing vegetation treatments to restore specific habitats on public lands. The proposed action also includes installation, construction, removal or modification of specific structural projects such as fences and water developments. The proposed action is not an all-inclusive management plan for the area or a programmatic EA, but it addresses several program areas that affect land health.

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

The public lands included in the BTW are managed according to decisions in the Dillon Resource Management Plan (RMP) approved in 2006. The proposed action is in conformance with the RMP and applicable guidance is in the Record of Decision and Approved Dillon RMP on pages 24 through 74. The Dillon RMP can be accessed using the internet at www.mt.blm.gov/dfo/rmp/index.html. This document is tiered to the Proposed Dillon RMP and Final Environmental Impact Statement (EIS).

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

The proposed action was developed while considering the goals, objectives and management recommendations in the Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout in Montana, the BLM's National Sage-grouse Strategy, and the Management Plan and Conservation Strategies for Sage Grouse in Montana.

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 EISs. The scoping process indicated which Critical Elements may be affected by the alternatives.

Table 2: Critical Elements of the Human Environment

Critical Element	Not present	Present, but not affected	May be affected*	Comments
Air Quality		X		See Blacktail Watershed Assessment Standard #4, page 7
Areas of Critical Environmental Concern (ACECs)	X			
Cultural Resources		X		Discussed under Critical Element: Cultural Resources
Environmental Justice		X		No minority of low income groups would be disproportionately affected by the proposed action.
Farmland (prime or unique)	X			Not present on BLM-administered lands
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 #1 – Riparian, Wetland and Aquatic Habitat and Associated Species
Native American Religious Concerns	X			
Threatened & Endangered (T&E) species		X		See Blacktail E.A. Biological Evaluation
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			
Wilderness			X	Blacktail Mountains and East Fork Blacktail Deer Creek W SAs Discussed under Critical Element Wilderness Characteristics

* An "X" in this box means that the resource is further evaluated in the affected environment and environmental impacts sections.
[1] Floodplains are part of stream systems. Actions which improve streams and riparian habitats will comply with Executive Order 11988 in that they are designed to restore and preserve the natural and beneficial values served by floodplains.

1.4.4 Description of Issues, Resource Concerns, Critical Elements and Objectives

These issues have a direct bearing upon the proposed action and the process of how the purpose and need will be achieved. They are used to drive development of alternatives, and effects to these issues are analyzed in detail. Resource concerns do not drive the development of alternatives, but are used to analyze and disclose the effects of various actions. Issues and resource concerns were identified through the Watershed Assessment and scoping process. Not all issues identified above are applicable to all allotments and the unleased tracts in this EA.

Issue #1: Riparian, Wetland, and Aquatic Habitat and Associated Species
"Riparian and Wetland Areas are in Proper Functioning Condition" is identified as one of the Western Montana Standards for Rangeland Health. PFC is defined as the ability of a stream or wetland to perform its riparian functions. These functions include sediment filtering, bank building, water storage, aquifer recharge and hydrologic energy dissipation. Streams or wetlands that are categorized as Functioning-at-Risk (FAR) with an upward trend also meet the riparian health Standard. The indicators used to determine riparian health are discussed in the BTW Assessment Report.

Objectives

- Restore deciduous woody habitat types (aspen, willow) in riparian areas that have been invaded by conifer trees.
- Increase deep rooted riparian vegetation (sedges, willows) where decreased composition was documented.
- Restore stream dimension, pattern and profile to the natural range of variation where concerns were documented.
- Restore, maintain or enhance native vegetation and hydrology to springs, seeps and wet meadows where concerns were documented.
- Reduce sediment loads where uses on public lands are causing increased sediment (eg. cattle loitering, road maintenance, etc).
- Maintain or enhance habitat for westslope cutthroat trout (WCT) in the following occupied streams within the watershed: Cottonwood, Jake Canyon, Alkali, Rock, Robb, and Teddy Creeks
- Maintain or enhance habitat for cold water fisheries in occupied streams within the watershed.
- Maintain or improve conditions on riparian/wetland habitat that is in PFC
- Prevent spread of noxious and invasive species into and within the watershed and reduce or eradicate existing infestations.
- Repair and maintain existing spring developments, troughs and spring exclosures.

Site specific objectives are shown in Appendix B – Monitoring Plan.

Issue #2: Upland Health, Sagebrush Steppe Habitat and Associated Species
"Uplands are in Proper Functioning Condition" 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 BTW Assessment Report.

Objectives:

- Increase cover and frequency of native perennial cool season herbaceous species where concerns were documented.
- Prevent spread of noxious and invasive species into and within the watershed and reduce or eradicate existing infestations.
- Maintain residual herbaceous cover for ground nesting birds, specifically sage grouse.
- Manage sagebrush habitats so that 70% or more of potential big sagebrush communities provide the vegetation composition and structure to sustain sage

grouse populations and other sagebrush obligate species such as antelope and pygmy rabbits.
- Maintain 15-25% sagebrush canopy cover and herbaceous cover conducive to nest and brood rearing success surrounding leks, as applicable within site potential.

Resource Concern #1: Special Status Species
Two T&E species are known to occur as transients in the BTW, the gray wolf *(Canis lupus*) and bald eagle *(Haliaeetus leucocephalus).* There is also the potential for grizzly bears *(Ursus arctos horribilus)* extending from the Gravelly Mountains on the Robb Creek allotment in the area of Crows Nest Creek and Sunset Peak. The Bald Eagle and Grizzly bear are currently up for delisting. Sage grouse and pygmy rabbits are sagebrush obligate species that have been petitioned for federal listing in the past and are currently BLM sensitive species. Objectives for sagebrush habitat are listed above under upland health.

Objectives:
- Monitor species activity and ensure that habitat requirements are met.

Resource Concern #2: Recreational Opportunities and Public Access
There are approximately 62 miles of designated motorized vehicle routes within the BTW. The majority of those designated route miles are within the Sweetwater Hills and to the south on those BLM lands north of the Robb-Ledford and Blacktail Wildlife Management Areas (FWP lands). Additional designated motorized routes traverse BLM lands from Red Canyon to the Clover Divide. Although there are no motorized routes designated within the Blacktail Mountains WSA within the planning area, some unauthorized motor vehicle activity occurs, especially during the big game hunting season. Throughout the entire planning area, motorized access is made difficult due to restrictions across private lands from the county-maintained Blacktail Road.

Objectives
- Implement the Dillon RMP Travel Management Plan. Close new unauthorized roads and trails when they are discovered. Rehabilitate as necessary to discourage future use and prevent weed spread.
- Maintain motorized wheeled vehicle access to those areas where it already exists, and improve access across private lands where opportunities are currently limited.
- Maintain opportunities for big game hunting, fishing, wildlife viewing, horseback riding, and other backcountry recreation.
- Reduce unauthorized motor vehicle use, especially during the hunting season, and within the Blacktail Mountains WSA.

Resource Concern #3: Socioeconomics
Many ranches that hold grazing permits on public lands administered by the BLM have developed operations that tightly weave public land grazing preferences together with private land management. For these ranches, calving, breeding, haying, feeding, shipping, summer pasturing, and marketing schedules have evolved in tandem with the stocking rates and season of use on the public land allotments.

Businesses in Dell, Lima and Dillon are likely to profit from hunting that occurs in the BTW. Dispersed recreational use is dominated by big game hunting. Hunting District 325 typically receives over 2,500 hunters and more than 13,000 "hunter days" annually. The BLM also currently authorizes three commercial enterprises to provide outdoor recreation opportunities for the public. These commercial recreation providers have their home and business headquarters in the area, and therefore provide employment opportunities and contributes to the local tax base

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

Objective

- Continue to contribute to the local economy by providing an opportunity for sustainable uses on public land (primarily livestock grazing and hunting).

Critical Element: Cultural Resources

A detailed summary and description of the cultural resources occurring on each allotment in the BTW 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.

Critical Element: Wilderness Characteristics

The planning area contains the Blacktail Mountains and East Fork Blacktail Deer Creek WSAs, which are managed in accordance with the *Interim Management Policy for Lands Under Wilderness Review* (BLM Handbook H-8550-1). Management according to this policy is intended to ensure that wilderness values contained in these areas are not impaired until such time as Congress either designates these areas as part of the National Wilderness Preservation System, or releases them from further consideration as wilderness. Important wilderness characteristics identified for these WSAs included: naturalness, opportunities for solitude, and opportunities for primitive and unconfined recreation.

Objectives

- Maintain or improve the wilderness characteristics that were present at the time of the wilderness inventory (1979-80).
- Reduce occurrence and impacts of unauthorized motor vehicle use.

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 unhealthy riparian and upland conditions, enhancing biodiversity and revision or renewal of Term Grazing Permits (i.e. changing livestock management) with appropriate Terms and Conditions to initiate significant and measurable progress towards achieving the Land Health Standards and established goals

and objectives within the BTW, while achieving BLM's multiple use mission. 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 the 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 BTW Management Plan can proceed.

Implementation of the Decisions resulting from this EA will begin in 2007, but full implementation of riparian/juniper treatments, revised grazing rotations and/or range improvement projects associated with these plans may take up to five years, and are subject to budget constraints. The new plans will be developed and 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)
- 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

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

2.0 Description of Alternatives

This chapter describes the alternative development process, alternatives considered but eliminated from further analysis, and alternatives that will be carried forward and fully analyzed. The three alternatives that will be fully analyzed are the No Action (continuation of current management) Alternative and two action alternatives. Various combinations of tools, allowable use levels, grazing strategies and projects were discussed at length and carefully considered during scoping and during the formulation of the alternatives by the ID team.

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 resource concerns and other factors considered during alternative development.

2.2 Alternatives Considered but Eliminated from Further Analysis

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

2.2.1 Eliminating livestock grazing from all BLM-administered lands in the watershed was considered, but eliminated from detailed study because it does not meet the purpose and need of this EA and it was previously analyzed in the Mountain Foothills EIS (March 1980). The recently updated and approved Dillon RMP identifies 59,188 acres of public land in the BTW as open for grazing and 4,073 acres of land closed for grazing, so a watershed wide “No Grazing” alternative would not be consistent with the Dillon RMP, would not meet the objectives for this planning effort, and is not consistent with the intent of other applicable acts, laws, and policies.

2.2.2 Both creating a Resource Reserve Allotment and eliminating livestock grazing from the unleased Stock Driveway were considered, but eliminated from detailed study because, in order to achieve either of these alternatives approximately 15 miles of fence would be necessary to control livestock from adjacent BLM, State of Montana and private land pastures. It is extremely steep topography along a north facing, heavily timbered slope with numerous cliffs and deep ravines. Since fencing to control livestock movement from adjacent lands would be extremely difficult or impossible to build and maintain and livestock movement from these areas onto public lands through the canyons and ravines cannot be controlled without fences, these alternatives were eliminated from further analysis.

2.2.3 Creating a riparian pasture that would enclose stream reach BT2 was considered but eliminated from detailed study. The "Blacktail Road Riparian Pasture" would have been created by installing 2 cattle guards on the Blacktail County road at or near the BLM/State boundaries in section 35 (T12S, R6W) and constructing approximately one mile of drift fence. This alternative was dropped from consideration because of the high cost (approximately $15,000) of installing cattle guards and building the fence. Planned actions to partially mitigate trailing impacts such as actively herding cattle through the portion of the allotment that contains stream reach BT2 are included in other alternatives.

2.2.4 Treating limber pine habitat to promote regeneration and slow or stop mortality due to mountain pine beetle and white pine blister rust, was considered but eliminated from detailed study. Due to the extensive mortality of limber pine and lack of healthy seed source treatments to promote a seed bed for limber pine establishment would likely be unsuccessful. There is currently little or no market potential for limber pine material, and information on treatment methods shown to effectively promote limber pine and reduce mortality from white pine blister rust is very limited (Schoettle, 2004.)

2.3 Description of Alternatives

2.3.1 Features Common to all Alternatives, Including the No Action

Livestock Management:

- Term Grazing Permits will be renewed for those 12 allotments determined to be meeting Land Health Standards, had no identified site specific concerns related to current management, and needed no changes to facilitate improved management. These allotments include Blacktail Ridge AMP, Kent Non-AMP, Robb Creek, Axes Canyon, Bench Field SGC, Red Canyon Isolated, Rock Creek, Robb Creek Non-AMP, Spear Place, Sweetwater Isolated, Timber Creek Isolated and Wire Field SGC. Term permits for other allotments may be modified as analyzed in this document.
- Temporary electric fence, livestock supplement placement (salt, protein block), riding, and herding are encouraged and if warranted, may be required 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 in areas naturally devoid of vegetation.

- Amend term grazing permits within the BTW to state that depredation losses from wolves may occur and that grizzly bear depredation may occur in the Robb Creek AMP, Blacktail Creek Trailing and Steamboat allotments.

Recreation Management:

- Sign the East Fork of Blacktail Deer Creek campground to make recreationists aware of grizzly bear activity in the area and recommend actions to minimize potential conflicts.
- Sign designated motorized vehicle routes to encourage responsible motorized recreation use and reduce the impacts of unauthorized motorized use.

Special Status Species:

- In habitats likely to support rare plants, field inspections will 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, activities that disturb mineral soil (such as blading, trenching, ripping, etc.) won't be allowed within the boundaries of populations of special status plants.

Noxious Weeds:

- Management of noxious weeds would continue in cooperation with Beaverhead and Madison County, federal and state agencies, private landowners and other partners.
- All invasive species on the Montana state noxious weed list will be treated as resources allow.
- Work with Beaverhead County on the continued monitoring and possible collection and redistribution of biological controls found on spotted knapweed in the Cottonwood Creek drainage.

Cultural Resources:

- As required by Section 106 of the National Historic Preservation Act, 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 will be mitigated through project abandonment or redesign. Care will be taken to avoid and protect significant cultural resources and any standing structures (should they occur) during the course of any proposed prescribed fire treatments. In addition, personnel from the BLM should be notified of the presence and location of any cultural resources should they be encountered by any permittees during the course of operations on public lands.

Monitoring:

Under all alternatives, resource monitoring will be conducted 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 here 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. Selection of the No Action Alternative may not be in conformance with the Dillon RMP.

Livestock Grazing Management:
Under Alternative A, livestock management would continue as per the Terms and Conditions contained in the current Term Grazing Permits. No new range improvement projects would be constructed. Existing livestock grazing management, as shown in Table 3, would continue on 20 allotments. Unauthorized livestock use would continue on the unleased Stock Driveway because no fences exist between adjacent and intermingled BLM, State of Montana and private land pastures.

Table 3. Livestock Grazing Allocation and Management

Allotment name, number , and category	Authorization Number	Season of Use Livestock #	[1]Grazing System	BLM Stocking Rate:	BLM AUMs	BLM Acres	State/ Private Acres	Total Acres
Blacktail Road Trailing 30603 (I)	#2505130	4/1 – 12/30 10 cattle	Season Long	5.4	90	484	0	484
Blacktail Ridge AMP 10147 (I)	#2505130	7/10 – 9/9 500 cattle (yearlings)	AMP -DR	30.4	179	5434	4089	9523
Kent- Non AMP 20625 (I)	#2505130	6/1 – 1/19 12 cattle	Season Long	8.7	92	796	0	796
Robb Creek AMP 20167 (I)	#2505172	8/1 – 8/30 400 cattle	AMP -RR	17.7	340	6025	2417	8442
Rock Creek 10512 (I)	#2505764	3/1 – 2/28 1500 sheep 210 cattle	Year Long	5.0	1036	5191	2972	8163
Spring Brook 10516 (I)	#2505768	5/16 – 11/6 450 cattle	AMP -RR	6.3	1000	6329	9227	15557
Sweetwater AMP 10471 (I)	#2505130	5/1 – 11/30 499 cattle	AMP- DR	5.9	2071	12178	7828	20006
Red Canyon 00113 (M)	#2505130	5/10 – 6/19 8/15 – 9/24 328 cattle	AMP- def alternating	6.1	367	2243	518	2761
Sweetwater Basin 10518 (M)	#2505770	7/4 – 8/12 232 cattle	Season Long	12.6	107	1347	2050	3397
Timber Creek AMP 10533 (M)	#2505788	6/1 – 11/4 173 cattle	AMP –RR	4.9	741	3591	1025	4616
Anderson 20105 (C)	#2505090	6/1 – 11/30 20 cattle	Season Long	6.8	123	833	0	833
Axes Canyon 10535 (C)	#2505790	7/1 – 8/30 1 cattle	Season Long	19	2	38	0	38
Bench Field SGC 20690 (C)	#2505130	3/1 -12/30 5 cattle	Season Long	60.1	49	2943	7758	10701
Red Canyon Iso. 10517 (C)	#2505769	7/1 – 10/15 18 cattle	Season	12.9	63	812	0	812

Allotment name, number , and category	Authorization Number	Season of Use Livestock #	[1]Grazing System	BLM Stocking Rate:	BLM AUMs	BLM Acres	State/ Private Acres	Total Acres
			Long					
Robb Crk. Non-AMP 20631 (C)	#2505172	6/1 – 11/30 9 cattle	RR	13.1	57	747	0	747
Spring Brook Iso. 30677 (C)	#2505768	5/15 -6/5 450 cattle 10/16-11/30 650 cattle	Season Long	7.3	232	1701	0	1701
Spear Place 10528(C)	#2505781	7/1 – 9/30 15 cattle	Season Long	6.7	47	317	0	317
Sweetwater Iso. 20666 (C)	#2505130	3/1 – 2/28 2 cattle	Year Long	12.7	23	291	0	291
Timber Crk. Iso. 10681 (C)	#2505788	6/1 – 10/15 8 sheep	Season Long	4.9	14	68	687	755
Wire Field SGC 20656 (C)	#2505130	3/1 – 6/30 56 cattle	Season Long	7.7	225	1732	0	1732
Stock Driveway (currently unleased)	#9999	4/1 – 12/20 Unknown	Season long			6,088		
BLM Totals				7.7 average	6,858	59,188		

[1]*Abbreviations: RR=rest rotation, DR=deferred rotation, AUM=Animal Unit Month*

Under this alternative, all other currently authorized activities (recreation permits, mineral development, etc.) would continue as permitted. No vegetation treatments would be completed under the No Action Alternative.

2.3.3 Features Common to Alternatives B and C

Livestock Management Changes:

- Changes would be initiated during the 2007 grazing season. Up to 5 years would be allowed to phase in projects and operational changes described under action alternatives, increasing economic and logistic feasibility for permittees and the BLM.
- 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 averages 4 inches along the greenline (to prevent excessive trailing along streams) on non-fisheries or non native fisheries streams and 6" on WCT streams, whichever occurs first. These annual use guidelines would be applicable to all allotments included in the BTW as a tool to help determine moves between pastures and in conjunction with long term trend data to determine management effectiveness.
- 4,483 acres of the previously unleased Stock Driveway would be combined with the existing Anderson Allotment and renamed the Steamboat Allotment #20105. (See Appendix A, Map D for the proposed Steamboat Allotment boundaries)
- 1,030 acres of the previously unleased Stock Driveway and 476 acres of the adjacent East Clover Creek Allotment would be combined with the current

Blacktail Road Trailing Allotment. The East Clover Creek Allotment was assessed in the Centennial Watershed Assessment and found to be meeting the land health standards. The same permittee and cattle are authorized to graze both the Blacktail Road Trailing and East Clover Creek Allotments and there are no fences separating them. Total acres on the Blacktail Road Trailing Allotment would be 1,990 and total AUMs would be 238.

Riparian Vegetation Treatments:

- An application for Streamside Management Zone (SMZ) Alternative Practice would be filed with the Montana Department of Natural Resources and Conservation (DNRC) for treating of juniper within the SMZ. SMZ laws and stipulations contained within the approved Alternative Practice would be followed for all vegetation treatments in or near riparian areas.
- Weed management would be completed in coordination with the riparian vegetation treatments.
- Seeding with native upland or riparian species may be completed following juniper removal along riparian areas that do not have adequate understory of desirable native deciduous woody or herbaceous species.
- Treatments would extend a maximum of 100 feet from the stream centerline on each side of the stream and would include mechanical and/or chemical treatment.
- Mechanical or manual treatments would include chainsaws or other hand tools.
- Chemical treatment may include Spike 20P or Spike 80DF under the drip line, Tordon 22K around the base of individual trees, or Velpar L applied to the foliage of smaller trees. Labels would be strictly adhered to and recommended distance from water would be followed. Spike 20P and Spike 80 DF would not be used where the ground water is less than five feet below the surface and Tordon 22K would not be used below the high water mark or where there is standing water. Velpar L can be used up to the water's edge.
- Permitted free use cutting of juniper woodland products (firewood, posts, decorative wood) would be allowed along any of the stream reaches identified for treatment where existing access is available.
- 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. Other tools, such as orienting and leaving the felled juniper, temporary fencing or hot tape may be used to allow the appropriate rest.
- Effectiveness monitoring would be established in each treatment unit (Appendix B). Monitoring would be used to determine if additional rest is necessary to meet objectives on specific units.

Water Developments:

- All applicable State and Federal Permits would be obtained and all permit conditions would be followed.
- Springs and natural wet meadows would be protected when developing water for livestock. Spring sources and, in most situations associated riparian wetland habitat would be fenced to exclude livestock use on all developed springs. Adequate water would be left at the spring source to maintain wetland hydrology, hydric soils, and hydric vegetation. Flow measurements would be gathered at springs proposed for development or redevelopment. Springs that have

inadequate flows (generally less than three gallons per minute) to provide a reliable water source for authorized livestock while maintaining existing wetland/riparian habitat would not be developed.

- Any water developments and associated stock tanks that are no longer in use would be removed, but fence exclosures to protect the spring source may be retained and maintained.
- Wildlife escape ramps would be installed in all water troughs.
- 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 or maintained.
- Soil disturbance resulting from pipeline installation would be seeded with a native seed mix during the fall following construction to reduce the spread of noxious or invasive species.

Fences:

- Any new or replacement boundary fences would normally be a 4-wire fence and any new interior (pasture) fences would normally consist of 3 wires, constructed in conformance with BLM Fencing Handbook H-1741-1.
- Existing BLM fences that impede wildlife movement would be modified or rebuilt to BLM specifications on a prioritized schedule.

2.3.4 Description of Alternative B

This alternative would include adjustments to grazing management, addition of structural range improvement projects, and/or vegetative treatments on 7 of the 20 allotments within the Blacktail Watershed and within the unleased Stock Driveway. The allotments included in Alternative B are Blacktail Road Trailing, Spring Brook, Sweetwater AMP, Red Canyon, Sweetwater Basin, Timber Creek AMP, Spring Brook Isolated and Anderson Allotments. The remaining 12 allotments within the watershed would continue to be managed as described under Alternative A (Section 2.3.2), with the addition of the allowable use guidelines defined above under features common to action Alternatives. The proposed projects are shown on individual Allotment Maps in Appendix A.

Travel Management:

Under Alternative B several minor adjustments would be made to designated routes for motorized vehicle use. First, it would designate approximately 4.9 miles of existing road as open to motorized vehicle use in the Clover Divide area on Blacktail Ridge (Map D). The road along the Clover Divide was inadvertently excluded from the roads database when the RMP was done, and has been added for consideration through this EA process as provided for under Action items #5 and #8 on page 61 of the Approved Dillon RMP. As provided for in Action Item #8, that road mileage would be added to the baseline road miles and designated open to motorized vehicle use.

Approximately 2.7 miles of designated road near Elk Gulch in the Sweetwater AMP allotment (Map F) would be closed to motorized vehicle use to address resource concerns, and approximately ½ mile of existing road in the same area would be

designated as open to complete a loop route. In the Rock Creek area (Map C), another adjustment would be made to designated motorized routes, closing approximately 1 mile of road in Section 12 north of Rock Creek, and opening a better-defined route of roughly the same distance through Sections 2, 3, and 11 to provide motorized public access into the same area of public lands.

Livestock Management:

Blacktail Road Trailing #30603

Management:

- Livestock use would be authorized for trailing cattle between 5/15 and 11/30. Three separate herds with up to 600 pair in each herd would be authorized to trail through the allotment on their way to and from Centennial Valley. Each trailing herd would be authorized in the Blacktail Road Trailing Allotment for up to three days in the spring/summer and one day in the fall for a maximum of nine days use each spring and three days of use each fall. This use would primarily be along and southeast of Clover Divide. Riders would move cattle through the northern portion of the allotment and not allow them to loiter along steam reach BT-2 (Blacktail Deer Creek).
- In addition to trailing use, livestock grazing would be authorized for up to 15 days during the late summer or fall (7/1 – 11/30) in conjunction adjacent State Land Leases. Cattle would be kept from grazing and loitering along stream reach BT-2 of Blacktail Deer Creek with riding, off-site water and/or hot tape during this time.
- Authorized AUMs would be 238 with the addition of a portion of the previously unleased Stock Driveway and the East Clover Creek Allotment incorporated into the Blacktail Road Trailing Allotment.

Projects:

- Construct approximately 1 mile of drift fence on State of Montana lands between the Steamboat Allotment and Blacktail Deer Creek to prevent cattle authorized on state land from drifting down and loitering along Blacktail Deer Creek.
- Construct an exclosure around the spring source at Paskett Spring. If necessary, redevelop spring and replace trough SE¼ section 1 (spring was originally developed in 1956.)

Spring Brook #10516

Management:

- In coordination with Natural Resource Conservation Service (NRCS), DNRC and private landowners, implement a deferred rotation grazing system as shown below. This grazing system includes several pastures that are comprised entirely of State and private lands. Only the pastures with BLM administered lands are shown below. BLM administered lands comprise 40% of the total AUMs within the Spring Brook Allotment. The Carter Creek Unit, comprised of State and private lands is also included in the proposed "Ranch Plan" developed by NRCS which adds several additional units that these same cattle would rotate through annually, allowing much shorter use periods than current management.
- Active authorized AUMs would be up to 1000.

- Authorized season of use would be 5/15 – 12/10. Authorized number of cattle (cow/calf pairs) would be up to 500 in all pastures except the Wood Canyon Pasture in which 225 heifers would be authorized.
- Authorize use for up to three days once every third year in the newly created Pappy's Gulch Riparian Pasture (see projects below.) This use would be anytime during the authorized grazing season except for during the hot season 7/15 – 9/15.

Year	Lower Virginia	Upper Virginia	Honeymoon	Sweetwater Basin	Wood Canyon
1	7/17 – 8/10 (21 days)	8/10 – 9/12 (32 days)	9/12 – 10/10 10/20 – 10/30 (40 days)	Rest	5/15 – 6/15 (Up to 25 days with heifers)
2	6/13 – 7/10 (21 days)	7/11 – 8/8 (32 days)	8/9 – 9/12 (40 days)	5/15 – 6/12 (28 days)	6/20 – 7/15 (25 days)
3	8/18 – 9/12 (21 days)	9/13 – 10/10 (32 days)	11/8 – 12/10 (35 days)	7/20 – 8/17 (28 days)	Rest
4	6/13 – 7/8 (21 days)	7/9 – 8/10 (32 days)	8/11 – 9/10 10/20 – 10/27 (44 days)	5/15 – 6/12 (28 days)	5/20 – 6/15 (25 days)
5	7/20 – 8/10 (21 days)	8/11 – 9/13 (32 days)	9/14 – 10/10 (22 days) Rest one half	11/8 – 11/30 (22 days)	6/20 – 7/15 (25 days)
6	5/15 – 6/5 (21 days)	6/6 – 7/7 (32 days)	7/8 – 8/13 10/15 – 10/21 (44 days)	8/27 – 9/25 (28 days)	5/20 – 6/10 (25 days)
7	Repeat Year 1				

Projects:

- Maintain all existing projects prior to livestock turnout.
- Construct approximately ¾ mile of fence in the SE portion of Sweetwater Basin Pasture to create Pappy's Gulch Riparian Pasture (NW¼ sec.13).
- The materials associated with the existing dysfunctional water development below Pappy's Gulch would be cleaned up and hauled to a landfill.
- Develop private water source at Honeymoon Springs SW¼ section 33 on private land and pipe water approximately 8 miles to six different watering sites (two on public lands administered by the BLM) as shown on Map E in Appendix A. This project would also include a lined, fenced water storage pond. This project would be designed and funded primarily by NRCS and the private landowner.
- Extend the existing pipeline in Wood Canyon approximately 1½ miles (¼ mile on public lands administered by the BLM) and add an additional trough on private land.
- Construct an exclosure at Honeymoon Spring, (on public land), BLM Project 671, SE ¼ SE ¼ Section 32, T9S, R5W, to protect the spring source and associated wetlands. Overflow water would be directed back into the spring brook or the system may be redesigned as a closed system to retain water at the spring source.

Sweetwater AMP #10471

Management:

- Implement a combination of a deferred and three pasture rest rotation grazing system as shown below.
- Authorized season of use would be 6/10 – 11/10 and authorized number of cattle would be 450.
- Up to seven days flexibility would be allowed on turn-on date.
- The length of time in each pasture would be approximately as follows: 2/2a, 3 and 4 = 45 days; 1 = 30 days; and 5 = Up to 30 days. The moves dates above are only approximate and may vary up to 5 days depending on annual production and resource conditions (utilization levels, sedge stubble height, etc.).
- Active AUMs would be 1,336.
- Pasture 1 would be a fall (dormant) season use pasture. Use would be authorized for 30 days in October-November each year. The livestock permittee would be encouraged to use low moisture protein blocks in strategic locations in the uplands to influence livestock distribution from riparian areas into the uplands and reduce use on palatable woody riparian vegetation.
- Pasture 5 would be used for up to 15 days during June and up to 15 days in late September – early October to wean (primarily on private land) prior to turning into Pasture.

	Pasture 1	**Pasture 2**	**Pasture 3**	**Pasture 4**	**Pasture 5**
Year 1	Use for up to 30 days between 1 0/1 – 11/10	Use for up to 45 days early 6/25 – 8/8	Use for up to 45 days late 8/9 – 9/22	REST	6/10 – 6/25 & up to 15 days from 9/23 – 10/15
Year 2	Use for up to 30 days between 10/1 – 11/10	Use for up to 45 days late 8/9 – 9/22	REST	Use for up to 45 days early 6/25 – 8/8	6/10 – 6/25 & up to 15 days from 9/23 – 10/15
Year 3	Use for up to 30 days between 10/1 – 11/10	REST	Use for up to 45 days early 6/25 – 8/8	Use for up to 45 days late 8/9 – 9/22	6/10 – 6/25 & up to 15 days from 9/23 – 10/15

Projects:

- Remove headbox and materials from Prospect Spring NE ¼ Section 2, which has gone dry. Retain/maintain the exclosure.
- Develop spring in NW ¼ section 1, (Pasture 2a). Connect to Prospect Pipeline and install a water trough. Spring area and associated wetlands would be fenced.
- Operator would drill a well on private lands within Pasture 4 to ensure a reliable water source (Section 15 and/or 23).

Red Canyon AMP #00113

Management:

- Continue grazing system as shown below
- Authorization would remain at 367 Active AUMs

- Authorization would be for 328 cattle from 5/10 – 6/19 or 8/15 – 9/24

Year	Red Canyon Unit
1	5/10 – 6/19 (40 days)
2	8/15 – 9/24 (40 days)

Projects:

- Develop spring(s) in NW ¼ sec. 7, build exclosure around spring complex BT298 and associated wetland areas and pipe water to a watering trough approximately 100 yards down slope from springs.

Sweetwater Basin #10518

Management:

- Implement a deferred rotation grazing system as shown below.
- Up to 300 cattle would be authorized to graze for up to 31 days between 9/1 and 10/31 during 3 out of 4 years. Early use would be authorized during 1 year out of 4 and would include up to 31 days use between 6/1 and 7/15.
- Active AUMs would remain at 107.
- Sheep trailing through to USFS allotments would not be authorized to stop overnight at Red Canyon Spring.

Year	Sweetwater Basin Unit
1	Up to 31 days between 9/1 – 10/31
2	Up to 31 days between 9/1 – 10/31
3	Up to 31 days between 9/1 – 10/31
4	Up to 31 days between 6/1 – 7/15

Projects:

- Construct an exclosure around Red Canyon Spring (East) and associated wetlands and use existing watering trough in Section 5. Install a shutoff valve between spring and trough and/or a float valve at the trough to maintain water at spring source.

Optional Projects:

- Operator would install a pipeline from existing trough and install an additional watering trough on private lands approximately 1 mile down slope from the existing trough.

Timber Creek AMP #10533

Management:

- Implement a combination of a deferred and three pasture rest-rotation grazing system as shown below. The Smith-Taylor Pasture would be used for up to 30 days in June or August and the Taylor Pasture would continue to be used from 8/1 – 10/20 annually (no resource concerns were noted in the Smith Taylor or Taylor Pastures under current management.)
- Authorization would be for 160 cattle from 6/1 – 10/20 for a total of 620 active AUMs.

- The herd would be split between Smith Taylor and June use pasture during two of four years and Smith Taylor and August use pasture two of four years.

Year	Smith Taylor	School Section	Mine	Harp	Taylor
1	6/1 – 7/1	6/1 – 7/1	7/2 – 8/1	REST	8/2 – 10/20
2	6/1 – 7/1	7/2 – 8/1	REST	6/1 – 7/1	8/2 – 10/20
3	8/2 – 9/1	REST	6/1 – 7/1	7/2 – 8/1	8/2 – 10/20
4	8/2 – 9/1	Repeat			8/2 – 10/20

Projects:

- Develop additional water in the Smith-Taylor Pasture in the SW ¼ section 25 and Mine Pasture in the NW ¼ of section 31 and/or the NE¼, section 26.

Optional Project:

- If feasible, develop off-site water in the Harp Pasture NW ¼ section 6.

Spring Brook Isolated #30677

Management:

- The Spring Brook Isolated Allotment is included in the NRCS plan which is partially outlined above under the Spring Brook Allotment. Two custodial pastures contain small tracts of BLM lands.
- A deferred grazing system would be implemented
- Up to 500 cattle would be authorized from 9/11 – 12/5 as shown below.
- Authorized active AUMs would remain at 232.

Year	Spring Brook	Middle Spring Brook
1	10/5 – 10/20 (15 days)	10/1 – 10/10 10/14 – 10/24 (20 days)
2	9/25 – 9/29 10/30 – 11/8 (15 days)	9/11 – 9/25 11/15 – 11/30 (29 days)
3	10/5 – 10/20 (16 days)	10/20 – 11/4 (15 days)
4	9/26 – 9/30 11/27 – 12/5 (14 days)	10/24 – 11/7 11/15 – 11/25 (26 days)
5	10/5 – 10/20 (16 days)	10/20 – 11/3 (15 days)
6	9/25 – 9/29 11/25 – 12/3 (14 days)	10/25 – 11/9 11/15 – 11/24 (26 days)
7	Repeat Year 1	

Stock Driveway #9999 and Anderson Allotment #20105 (Steamboat Allotment #20105)

Management:

- Implement a three unit deferred rotation grazing system as shown below.
- Up to 266 cattle would be authorized from 6/15 – 11/15 for a total of 1,340 active AUMs.
- Salt would not be placed within ½ mile of water sources on BLM administered lands.
- Five days flexibility would be allowed on turn-out date.
- The moves dates above are only approximate and may vary up to 7 days depending on annual production and resource conditions (utilization levels, sedge stubble height, etc.).

Year	Granny	Steamboat Rock	Cooks Lake
1	6/15 – 7/31 11/1 – 11/15	8/1 – 8/31	9/1 – 10/31
2	8/1 – 8/31 11/1 – 11/15	6/15 – 7/31	9/1 – 10/31
3	Repeat Year 1		

Projects:

- Construct approximately 2½ miles of drift fence at three different locations to create three grazing units and control livestock movement within the designated allotment (1½ miles on BLM administered lands and 1 mile on State administered lands); ¾ mile of drift fence would be located in the NE¼, section 17, T 12S, R6W; ¾ mile drift fence would be located in the NE¼, section 34 and NW¼, section 35, T13S, R6W; 1 mile of drift fence would be located on state administered land W½, section 26, T13S, R6W.
- Fence Cooks Lake and associated wetlands and pipe water to a trough approximately ¼ mile south (SE¼, section 20, T12S, R6W.)
- Develop Granny Springs in the Granny Pasture, construct a spring/wetland exclosure to protect the water source(s) and associated wetlands and pipe water to a trough approximately 100 yards from the spring source (NW¼, section 32, T11S, R6W.)
- Construct approximately 1½ miles of fence to create the Teddy Creek WCT and Riparian exclosure. The fence would be constructed along the eastern bank of Teddy Creek in sections 5 & 7 T 12S, R 6W and connect with existing pasture boundary fence in NE ¼ of section 7. A hardened water gap would be constructed on the downstream end to provide for livestock water. The exclosure would be constructed to protect WCT habitat along portions of Teddy Creek located in the Steamboat Allotment #20105 on public land. Livestock grazing may be permitted on a periodic basis every three to five years if needed to control Canada thistle or address other resource needs. Authorized use would not exceed 3 days.

Riparian Vegetation Treatments:

Moose Creek RU-17A 6/12/2006

Under Alternative B, 3.1 miles (83 acres) of riparian habitat would be treated to reduce/remove Rocky Mountain juniper (juniper) on the lower reaches Moose Creek and a tributary to Moose Creek. The goal would be to treat (kill or remove) all juniper trees within the riparian zone. Depending on the treatment type used, a range of 80 – 95% control would be considered successful (refer to Riparian Vegetation Treatments Common to Alt B & C Section 2.3.3). Alternative B includes those riparian areas that include fisheries, and therefore were determined to be the highest priority for treatment to restore or maintain PFC. The following table outlines the proposed units, objectives, and treatment types for riparian juniper treatments in Alternative B. Unit locations and boundaries are shown on the Alternative B – Riparian Vegetation Treatment Units map found in Appendix A. These reaches are displayed on an allotment basis in Table 7. in Chapter 3.

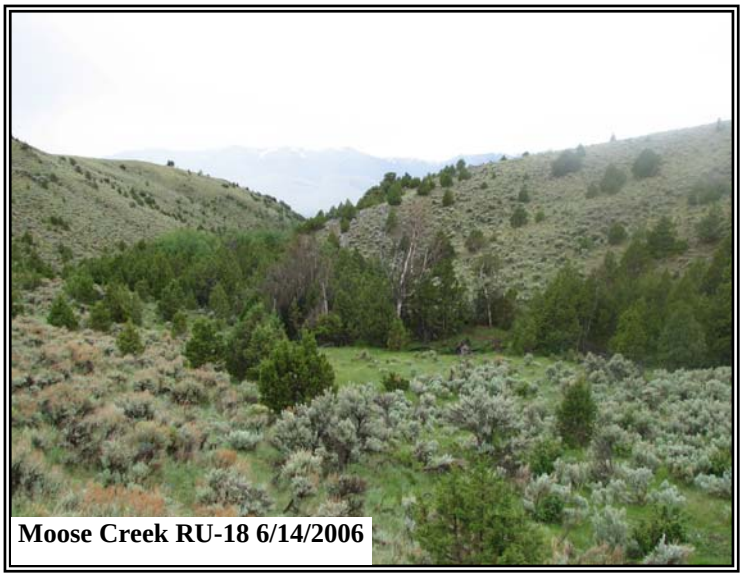

Moose Creek RU-18 6/14/2006

Table 3. Alternative B Description of Riparian Juniper Treatments

Unit Name	Reach Name & #	Miles/ Acres	Objective(s)	Treatment Type(s)
MCR1	Moose Creek RU16F, RU17A	1.2 mi. 33 ac.	↓ juniper riparian encroachment and restore deciduous woody and herbaceous species.	Chemical and mechanical. May be followed by seeding.
MCR2	Tribs. to Moose Creek RU18, RU17B	1.9 mi. 50 ac.	↓ juniper riparian encroachment and restore deciduous woody and herbaceous species.	Chemical and mechanical followed by seeding.

2.3.5 Description of Alternative C

Livestock Management:
Alternative C includes adjustments to grazing management on the same allotments as Alternative B but are generally more intense and/or conservative than those described in Alternative B and/or propose structural range improvement projects to facilitate or compliment described management. The proposed projects are shown on individual Allotment Maps in Appendix A.

Blacktail Road Trailing #30603
Management:

- Trailing use would be the same as described in Alternative B.
- In addition to trailing use, authorized use described in Alternative B would be alternated every other year with a rest treatment.

Projects:

- Reclaim Paskett Spring and remove old project materials, including dysfunctional trough. A spring/riparian exclosure would be constructed around the spring source.
- Construct approximately 1 mile of drift fence on State of Montana lands between the Steamboat Allotment and Blacktail Deer Creek to prevent cattle authorized on state land from drifting down and loitering along Blacktail Deer Creek.

Spring Brook #10516

- Implement a combination of a deferred and rest rotation grazing system as shown below.
- Active authorized AUMs would be 734.
- Authorized season of use would be 6/1 – 10/28.
- Authorized number of cattle (cow/calf pairs) would be up to 350 in all pastures except the Wood Canyon Pasture in which 225 heifers would be authorized.
- Create Pappy's Gulch Riparian Pasture. Authorized use would be for up to three days one out of three years.

Year	Lower Virginia	Upper Virginia	Honeymoon	Sweetwater Basin	Wood Canyon
1	7/16 – 8/29	8/30 – 9/12	9/13 – 10/28	6/1 – 7/15	REST
2	REST	6/16 – 7/25	7/26 – 9/3	9/4 – 10/13	6/1 – 6/15
3	6/1 – 7/10	8/20 – 9/28	REST	7/11 – 8/19	9/29 – 10/13
4	9/13 – 10/28	7/16 – 8/29	6/1 – 7/15	8/30 – 9/12	REST
5	6/16 – 7/25	REST	9/4 – 10/13	7/26 – 9/3	6/1 – 6/15
6	8/20 – 9/28	8/20 – 9/28	7/11 – 8/19	REST	9/29 – 10/13
7	Repeat Year 1				

Projects:

- Maintain all existing projects prior to turn-out
- Construct approximately ¾ mile of fence in the SE portion of Sweetwater Basin Pasture (NW ¼ section13) to create Pappy's Gulch Riparian Pasture
- Construct an exclosure at Honeymoon Spring (BLM Project 671), SE ¼ SE ¼ Section 32, T9S, R5W, to protect the spring source and associated wetlands.

Sweetwater AMP #10471

Management:

- Implement a combination of a deferred and four pasture rest rotation grazing system as shown below.
- Authorized season of use would be 6/1 – 11/10 and authorized number of cattle would be 400.
- Active AUMs would be 1,265
- Pasture 1 would be a fall (dormant) season use pasture. Use would be authorized for 30 days during October-November each year.
- Cattle would be taken into Pasture 5 approximately 10/1 to wean (on private land) before turning onto Pasture 1 approximately 10/10.

Year	Pasture 1	Pasture 2	Pasture 3	Pasture 4	Pasture 5
1	10/10 – 11/10 30 days	6/1 – 7/10 40 days	7/11 – 8/20 40 days	REST	8/21 – 10/1 40 days
2	10/10 – 11/10	7/11 – 8/20	8/21 – 10/1	6/1 – 7/10	REST
3	10/10 – 11/10	8/21 – 10/1	REST	7/11 – 8/20	6/1 – 7/10
4	10/10 – 11/10	REST	6/1 – 7/10	8/21 – 10/1	7/11 – 8/20

Projects:

- Same as Alternative B

Red Canyon #00113

- Implement a three pasture rest rotation grazing system as shown below.
- Authorization would remain at 367 active AUMs for two years in three.
- Authorization would be for 328 cattle from 5/10 – 6/19 or 8/15 – 9/24

Year	Red Canyon Unit
1	5/10 – 6/19 (40 days)
2	8/15 – 9/24 (40 days)
3	REST

Projects:

- Same as Alternative B

Sweetwater Basin #10518

Management:

- Same as Alternative B.

Projects:

- RU173 entire riparian area would be fenced and the existing livestock trough would be removed and located approximately ½ mile down slope on private land. Water would be regulated by a shutoff valve and/or float valve at the trough.

Timber Creek AMP #10533

Management:

- Implement a four pasture rest-rotation grazing system in the Smith-Taylor, School Section, Mine and Harp Pastures as shown below. The Taylor Pasture would be used from 9/1 – 10/20 annually.
- Authorization would be for up to 160 cattle from 6/1 – 10/30 for a total of 664 active AUMs.
- Up to seven days flexibility would be allowed for turn-on date.
- The length of time in each pasture would be approximately 30 except for the Taylor Pasture which would be authorized for up to 60 days of fall (dormant season) use. The moves dates above are only approximate and may vary up to 5 days depending on annual production and resource conditions (utilization levels, sedge stubble height, etc.).

Year	Smith Taylor	School Section	Mine	Harp	Taylor
1	6/1 – 6/30 30 days	7/1 – 7/31 30 days	8/1 – 8/31 30 days	REST	9/1 – 10/30 30 days
2	7/1 – 7/31	8/1 – 8/31	REST	6/1 – 6/30	9/1 – 10/30
3	8/2 – 9/1	REST	6/1 – 7/1	7/1 – 7/31	9/1 – 10/30
4	REST	6/1 – 6/30	7/1 – 7/31	8/1 – 8/31	9/1 – 10/30

Projects:

- Same as Alternative B

Spring Brook Isolated #30677

Management:

- Same as Alternative B

Projects:

- Corridor fence stream reaches RU-100 and RU-101 (approximately ½mile of fence.) Each reach is .2 mile long and currently fenced on one side.

Stock Driveway #9999 and Anderson Allotment #20105 (Steamboat Allotment #20105)

Management:

- Implement a four unit deferred rotation grazing system would be implemented as shown below.
- Up to 242 cattle would be authorized from 6/1 – 11/15 for a total of 1,340 active AUMs.
- Salt would not be placed within ½ mile of water sources on BLM administered lands.
- Five days flexibility would be allowed on turn-out date.
- The moves dates above are only approximate and may vary up to 5 days

depending on annual production and resource conditions (utilization levels, sedge stubble height, etc.).

- The November use in the Corral Pasture would be primarily on private meadows.
- Funnel Basin Riparian Pasture would be authorized for up to 10 days use between 9/1 & 10/31 every third year.

Year	Corral	Granny	Steamboat Rock	Cooks Lake
1	6/1 – 6/23 11/1 – 11/15	6/24 – 7/15	7/16 – 8/31	9/1 – 10/31
2	6/24 – 7/15 11/1 – 11/15	6/1 – 6/23	9/1 – 10/31	7/16 – 8/31
3	Repeat			

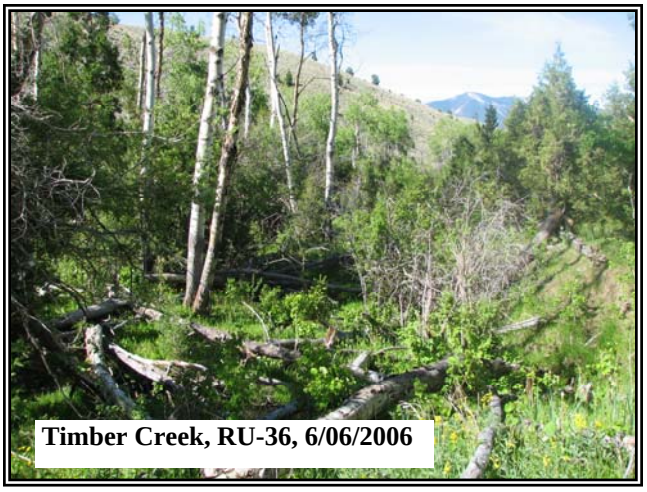
Projects:

- Construct approximately 2½ miles of drift fence at three different locations to create three grazing units and control livestock movement within the designated allotment (1½ miles on BLM administered lands and 1 mile on State administered lands); ¾ mile of drift fence would be located in the NE¼, section 17, T 12S, R6W; ¾ mile drift fence would be located in the NE¼, section 34 and NW¼, section 35, T13S, R6W; and 1 mile of drift fence would be located on state administered land W½, section 26, T13S, R6W.
- Construct 1¾ mile of division fence in S½ sections 19 & 20, T11S, R6W to create the Granny and Corral Pastures.
- Fence Cooks Lake and associated wetlands and pipe water to a trough approximately ¼ mile south (SE¼, section 20, T12S, R6W.)
- Develop Granny Springs in the Granny Pasture, construct a spring/wetland exclosure to protect the water source(s) and associated wetlands and pipe water to a trough approximately 100 yards from the spring source (NW¼, section 32, T11S, R6W.)
- Construct approximately 2 miles of fence to create the Funnel Basin Riparian Pasture below Cooks Lake along the north side of the ridge (approximately 1¼ miles would be on BLM administered lands and approximately ¾ mile would be on State administered lands.) The riparian pasture fence would be located in the E ½ section 20 and the W ½ section 21, T12S, R6W. Heavy snow accumulation would be considered in the fence design.

Riparian Vegetation Treatments:

Under Alternative C, 7.9 miles of riparian habitat would be treated to reduce/remove juniper using a variety of tools. The goal would be to treat (kill or remove) all juniper trees within the riparian zone. Maximum treatment area would be100 ft each side of stream from stream center. Depending on the tool(s) used, a range of 80 – 95% mortality would be considered successful. The type of treatment would be the same as described in Alternative B. Alternative C includes all riparian areas in the BTW in which juniper encroachment was determined as a contributing factor for not meeting the riparian health standard or a threat to PFC. It includes all riparian reaches included in Alternative B, plus an additional 4.8 miles of riparian habitat as shown below. Table 4 displays the proposed units, objectives, and treatment types for riparian juniper treatments in Alternative C. Riparian Treatment Units are displayed on Map B. found in Appendix A.

The photos below show two of the reaches proposed to be treated on Timber Creek and Little Elk Gulch under Alternative C.


Timber Creek, RU-36, 6/06/2006

Little Elk Gulch, RU-13C, 6/26/2006

Table 4. Alternative C Description of Riparian Juniper Treatments

Unit Name	Reach Name & #	Miles/ Acres	Objective(s)	Treatment Type(s)
TCR1	Timber Creek RU36, RU48, RU49A	.8 mi. 53 ac.	↓ juniper riparian encroachment and restore deciduous woody and herbaceous species.	Chemical and mechanical. May be followed by seeding.
ELK1	Little Elk Gulch RU13A, RU13B, RU13C, RU14	2.1 mi. 58 ac.	↓ juniper riparian encroachment and restore deciduous woody and herbaceous species.	Chemical and mechanical followed by some seeding in the lower reaches.
ELK2	Elk Gulch. RU12, RU12A	1.9 mi. 54 ac.	↓ juniper riparian encroachment and restore deciduous woody and herbaceous species.	Chemical and mechanical followed by seeding in the lower reaches.
MCR1	Moose Creek RU16F, RU17A	1.2 mi. 33 ac.	↓ juniper riparian encroachment and restore deciduous woody and herbaceous species.	Chemical and mechanical. May be followed by seeding.
MCR2	Tribs. to Moose Creek RU18, RU17B	1.9 mi. 50 ac.	↓ juniper riparian encroachment and restore deciduous woody and herbaceous species.	Chemical and mechanical followed by seeding.

2.4 Summary Comparison of Alternative Actions

A summary comparison of Alternative actions by allotment for the eight allotments in which changes in livestock management and/or addition of range improvements are proposed is shown in Table 5. A detailed discussion of impacts for each alternative and issue can be found in Chapter 4.

Table 5. Summary Comparison of Alternative Livestock Management Actions by Allotment

ALLOTMENT	TERMS & CONDITIONS	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Blacktail Road Trailing 30603 (I) Acres: 484	**Season of Use Livestock numbers**	4/1 – 12/30 10 cattle (custodial use)	5/15 – 11/30 Up to 9 days each spring and 4 days each fall with trailing herds. Up to 15 days fall use.	5/15 – 11/30 Trailing would be the same as Alternative B. Up to 15 days fall (deferred) use alternated with rest treatment.
	Active BLM AUMS	90	Up to 238 (combined with East Clover Creek Allotment and additional 1,030 acres from previously unleased stock driveway)	Up to 238
	Grazing System and Allowable Use Levels	Trailing; season long No allowable use levels	Trailing only along County Rd (Blacktail Deer Creek). Deferred use for up to 15 days. 4" stubble height; 50% use in uplands	Trailing only along County Road (Blacktail Deer Creek). Deferred use alternating with rest 4" stubble height; 50% use in uplands
	Projects	No new projects.	Construct spring exclosure at Paskett Spring, replace trough, redevelop if necessary Approx. ¾ mile drift fence in Steamboat Allotment to prevent summer livestock use.	Clean up and reclaim Paskett Spring, construct spring exclosure. Approx. ¾ mile drift fence in Steamboat Allotment to prevent summer livestock use.
Spring Brook 10516 (I) Acres: 6329	**Season of Use Livestock numbers**	5/16 – 11/6 450 cattle	5/15 – 12/10 Up to 500 cattle in all pastures except Wood Canyon: 250 yearlings. (Several additional private and state pastures have been added in this alternative) Use riparian pasture for up to 3 days 1 in 3 years	6/1 – 10/28 Up to 350 cattle (225 heifers in Wood Canyon) Use riparian pasture for up to 3 days 1 in 3 years
	Active BLM AUMs	1000	Up to 1000	Up to 734
	Grazing System and Allowable Use Levels	Combination of deferred and rest rotation; No allowable use levels.	Combination of deferred and rest rotation; much shorter duration of use periods. 4" stubble height; 50% use in uplands	Combination of a deferred and rest rotation with short use periods. 4" stubble height; 50% use in uplands.

ALLOTMENT	TERMS & CONDITIONS	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
	Projects	No new projects.	Existing projects must be maintained prior to turnout. Approx. 3½ miles of pipeline, a lined fenced water storage pond and 2 troughs on public lands, additional pipeline and troughs on State and private lands in coordination with NRCS. Approximately ¾ mile of fence to create Pappy's Gulch Riparian Pasture.	Existing projects must be maintained prior to turnout. Approx. ¾ mile of fence to create Pappy's Gulch Riparian Pasture
Sweetwater AMP 10516 (I) Acres: 12178	**Season of Use Livestock numbers**	5/1 – 11/30 499 cattle	6/10 – 11/10 450 cattle	6/1 – 11/10 400 cattle
	Active BLM AUMs	2071	Up to 1336	Up to 1265
	Grazing System and Allowable Use Levels	Deferred rotation No allowable use levels	3 pasture rest rotation pastures 2, 3, & 4. Deferred system in pastures 1 and 5. 4" stubble height; 50% use in uplands	4 pasture rest rotation pastures 2, 3, 4 and 5. Deferred use in pasture 1. 4" stubble height; 50% use in uplands
	Projects	No new projects	Up to two off-site water developments with spring exclosures. 2 wells on private lands	Up to two off-site water developments with spring exclosures. 2 wells on private lands.
Red Canyon 00113 (M) Acres:812	**Season of Use Livestock numbers**	5/10 – 6/19 8/15 – 9/24 328 cattle	5/10 – 6/19 8/15 – 9/24 328 cattle	5/10 – 6/16 8/15 – 9/24 REST 328 cattle
	Active BLM AUMs	367	Up to 367	Up to 367; two years out of three
	Grazing System and Allowable Use Levels	Alternating deferred rotation No allowable use levels	Alternating deferred rotation. 4" stubble height; 50% use in uplands	3 year rest rotation. 4" stubble height; 50% use in uplands
	Projects	No new projects	One off-site water development & spring exclosure	Same as Alternative B
Sweetwater Basin 10518 (M) Acres: 1347	**Season of Use Livestock numbers**	7/4 – 8/12 232 cattle	Up to 31 days between 9/1 & 10/31 during 3 of 4 years and between 6/1 & 7/15 during 1 of 4 years. 232 cattle	Same as Alternative B
	Active BLM AUMs	107	107	107
	Grazing System and Allowable Use Levels	Season long No allowable use levels	Deferred rotation 4" stubble height; 50% use in uplands	Deferred rotation 4" stubble height; 50% use in uplands

ALLOTMENT	TERMS & CONDITIONS	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
	Projects	No new projects	Construct spring exclosure, redesign water overflow.	Fence entire riparian/wetland area on public lands move watering trough down onto private land
Timber Creek AMP 10533 (M) Acres: 3591	**Season of Use Livestock numbers**	6/1 – 11/4 173 cattle	6/1 – 10/20 160 cattle	6/1 – 10/30 160 cattle
	Active BLM AUMs	741	Up to 620	Up to 664
	Grazing System and Allowable Use Levels	Combination of rest and deferred rotation No allowable use levels.	Combination of deferred and 3 pasture rest rotation. 4" stubble height; 50% use in uplands	4 pasture rest-rotation system; deferred grazing in Taylor Pasture (9/1 – 10/20) 4" stubble height; 50% use in uplands
	Projects	No new projects	Up to 4 off-site water developments. Replace troughs.	Same as Alternative B
Spring Brook Isolated 30677 (C) Acres:1701	**Season of Use Livestock numbers**	5/15 – 6/5 450 cattle 10/16 – 11/30 650 cattle	9/11 – 12/5 500 cattle	Same as Alternative B
	Active BLM AUMs	232	Up to 232	Up to 232
	Grazing System and Allowable Use Levels	Season long	Deferred Use 4" stubble height; 50% use in uplands	Deferred Use 4" stubble height; 50% use in uplands
	Projects	No new projects	No new projects.	Approx. ½ mile of fence to corridor fence two stream reaches.
Steamboat 20106 (I) Acres: 5316 (previously Anderson Allot 833 Acres; plus 4,483 acres of the Stock Driveway)	**Season of Use Livestock Numbers**	Anderson: 6/1–11/30 20 cattle Stock Driveway was unleased	6/15 – 11/15 266 cattle (combined with 4,483 acres of Stock Driveway)	6/1 – 11/15 242 cattle (combined with 4,483 acres of Stock Driveway)
	Active BLM AUMs	123	Up to 1340	Up to 1340
	Grazing System and Allowable Use Levels	Season long	Deferred rotation	Deferred Rotation
	Projects	No new projects	Up to 4 miles of drift fence to create three units. Construct riparian fence around Cooks Lake install trough ¼ mile away. Construct Teddy Creek WCT exclosure.	Up to 4 miles of fence as shown in Alt B and additionally, 1¾ miles of pasture division fence to create a fourth unit. Construct Cooks Lake riparian exclosure with watering trough. Create Funnel Spring Riparian Pasture by constructing up to 2 ½ miles of fence.

Table 6. Summary Comparison of Alternative Riparian Vegetation Treatments

Unit	Alternative A	Alternative B	Alternative C
TCR1	No riparian vegetation treatments would be completed	0	.8 mi; 53 ac.
ELK1		0	2.1 mi; 58 ac.
ELK2		0	1.9 mi; 54 ac.
MCR1		1.2 mi; 33 ac.	1.2 mi; 33 ac.
MCR2		1.9 mi; 50 ac.	1.9 mi; 50 ac.
TOTAL	**0 mi; 0 ac.**	**3.1 mi; 83 ac.**	**7.9 mi; 298 ac.**

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 identified in Chapter 1, but also encompasses the wider landscape of the entire BTW. Additional information on the affected environment within the BTW can also be found in the BTW Assessment Report which is incorporated into this document by reference. The BTW Assessment Report is on file at the Dillon Field Office or can be accessed online at http://www.blm.gov/mt/st/en/fo/dillon_field_office.html

3.1 General Setting

Elevations on public lands, within the assessment area, range from approximately 5,500 to nearly 10,000 feet. Topography varies from stream drainage bottoms and alluvial fans to steep mountain ravines and ridge tops. Average annual precipitation within the watershed varies from 12 inches in the lower elevations and valley bottoms to 24 inches in the higher elevations.

Soils in the BTW are affected primarily by climate and parent material. They are in Frigid and Cryic temperature regimes. The soils in the assessment area are formed primarily in alluvium, colluvium, and residuum. Soils are primarily sandy loams, loams and clay loams and range from shallow to very deep. Some soils are violently effervescent at the surface, while others have no lime in the profile. Rock fragments range from 15 percent in the soil surface layer to more than 50 percent rock fragments at depths of 15 inches or more. Ecological sites were mainly loamy, limy, loamy droughty, loamy steep and shallow. Slopes range from undulating to very steep.

Vegetation in the watershed reflects the diversity of ecological conditions across the landscape. The dominant plant communities and habitat types change according to soils, precipitation, elevation, slope and aspect (direction the slopes are facing). A wide variety of vegetation is found from wetland and riparian species dependent on water and moist soils, to sagebrush and grass dominated plant communities that thrive on dryer upland sites. Forested habitats cover the higher elevations. This diverse landscape provides habitat and structural niches for a wide variety and abundance of wildlife.

The area along the crest of Blacktail Ridge from Clover Divide northwest to Red Canyon is currently unleased for livestock grazing. It was part of the Blacktail Stock driveway withdrawal. This withdrawal was allowed to expire in 2004 since it was no longer needed as a stock driveway. This action left this area of public land, approximately 6,088

acres, in an "unleased" status. There are currently no fences along the north side of these unleased parcels to control livestock movement from adjacent areas where livestock use is authorized. Consequently, livestock use is occurring in these areas.

Fire History

Several recent wildfires have occurred in the BTW that resulted in localized changes to the landscape. The Teddy Creek fire occurred in mid–October, 1999 and burned approximately 2,500 acres of private, state and federal lands. The ID team visited portions of the Teddy Creek fire area during the summer of 2006 and found the most notable fire effects were replacement of sagebrush with native grasses and minor surface erosion on sparsely vegetated slopes.

The Sweetwater fire occurred in mid-August, 1988 and burned approximately 7,500 acres of mixed ownership. Weather events during the years following the fire produced extremely high stream flows in Little Elk Gulch, Elk Gulch, Moose Creek and associated tributaries. The ID team found evidence of debris torrents that drastically altered stream channel characteristics. This fire also consumed a large area of sagebrush/grassland and smaller, isolated timber stringers and patches. Currently, the affected streams are re-stabilizing and much of the sagebrush/grassland is nearing pre-burn conditions. Many of the recently exposed alluvial deposits in the stream channels show evidence of past similar events in layers of ash and charred woody material.

3.2 Description of Affected Resources/Issues

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

The BTW is primarily located within the larger Beaverhead River Watershed. Portions of the BTW also include the Ruby River Watershed. Blacktail Deer Creek and Sweetwater Creek are water quality limited streams, according to Montana Department of Environmental Quality (DEQ).

There are approximately 65 miles of stream within the BTW. The associated riparian habitats are used by approximately 75% of all wildlife species in this area for at least some portion of their annual life cycle. There are 12 perennial streams on public land that support cold water fisheries (seven native fish species, including WCT and three non native species.)

The riparian condition on 27 stream miles was either PFC or FAR with an upward trend; 30 stream miles were FAR with a static, not apparent or downward trend, or non-functioning (NF). The riparian status of perennial stream miles within the watershed is shown in Tables 4a and 4b and on Maps C, D and E in the BTW Assessment Report.

Twenty nine springs, both developed (20) and undeveloped (9), were identified through the assessment process. The ID team visited 20 of the 29 isolated springs; all of which were found to be FAR.

Both stream conditions and spring conditions were contributing to the riparian health standard **not** being met on the following seven allotments and the unleased Stock Driveway:

Blacktail Road Trail - 30603	Stock Driveway (unleased)
Red Canyon - 00113	Sweetwater AMP - 10471
Spring Brook - 10516	Sweetwater Basin - 10518
Spring Brook Isolated - 30677	Timber Creek - 10533

Additional documented concerns from the Assessment Report include expansion of conifers into riparian habitat, loss of willow and aspen, decreased composition of deep rooted riparian vegetation, alteration of stream channels, and sedimentation. Fire exclusion due to fire suppression and historic livestock grazing has favored conifer expansion. Conifer expansion in riparian areas may be altering hydrology in addition to the more easily observable impacts noted above. Rocky Mountain juniper encroachment into riparian areas was a noted concern in the Sweetwater AMP Allotment on Moose Creek, Elk Gulch and Little Elk Gulch and in the Timber Creek Allotment in Timber Creek. Percent canopy cover of juniper on specified riparian reaches is shown in Table 7. A full description of the affected riparian habitat and findings analysis can be found in the BTW Assessment Report on pages 17-25.

Table 7. Rocky Mountain Juniper Canopy Cover along specified stream reaches

Allotment Name and #	Reach #	Stream Name	Percent Cover of Rocky Mountain Juniper	Reach Length (miles)
Timber Creek	RU-36	Timber Creek	35-45	.99
#10533	RU-48	Timber Creek	75-85	.45
	RU-49A	Timber Creek	75-85	.37
Sweetwater AMP	RU-12	Elk Gulch	5-15	1.0
#10471	RU-12A	Elk Gulch	Trace	.9
	RU-13A	Little Elk Gulch	75-85	.53
	RU-13B	Little Elk Gulch	55-65	.64
	RU-13C	Little Elk Gulch	15-25	.46
	RU-14	Little Elk Gulch	75-85	.50
	RU-16F	Moose Creek	75-85	.82
	RU-17A	Moose Creek	55-65	.36
	RU-17B	Moose Creek Trib	45-55	.94
	RU-18	Moose Creek Trib	65-75	.93
Total Miles				**8.89**

3.2.2 Issue #2: Upland Health, Upland Habitat and Associated Species

Upland habitat consists of forests, sagebrush and grasslands. According to satellite imagery, 95 percent of the watershed is classified as uplands (40 percent grasslands, 39 percent sagebrush, and 16 percent forested). Table 2 in the BTW Assessment Report summarizes the general cover types in the BTW. A full report on the existing upland conditions and habitat associations is found in pages 13-17 of the BTW Assessment Report.

The upland health standard was **not** met on one allotment, the Spring Brook allotment. Within this allotment, as well as in other site specific areas within the BTW, the relative dominance of the tall palatable cool season grasses has shifted to shorter, less palatable grasses. This affects the hydrologic cycle (precipitation infiltration) and wildlife habitat. Other concerns include decadence and/or dying of low sage throughout the valley bottom (determined to be drought related), juniper expansion into sagebrush habitats and presence of noxious and invasive plant species.

Evidence of historically recurring fire is found throughout the analysis area in forests and woodlands. Fire exclusion caused primarily by fire suppression and livestock management on rangelands over the last century has changed the structure, density, and species composition within forest and grassland communities.

Fire occurrence records from the BLM, the U.S. Forest Service and the Montana DNRC indicate fire suppression resources have responded to approximately 13 wildland fires within the analysis area since 1981. Most fire starts were lightning caused. Due to changes in record-keeping and agency policy, this number represents the lowest possible number of fire suppression responses by the federal and state agencies during this time period.

Forest health concerns include departure from the historic range of variability (species composition, structure, etc.), increased fuel loading, and occurrence or high susceptibility for insect/disease outbreak. Across the south and west sides of the Blacktail assessment area, the potential for stand replacing wildfires has increased due to the increased density of forested stands. Within the Blacktail Mountains WSA, management should emphasize maintaining, or restoring, natural conditions and processes to ensure that the wilderness character of the area is maintained or improved over the long-term. The unleased tracts along Blacktail Ridge had a high degree of limber pine mortality due to mountain pine beetle and white pine blister rust.

3.2.3 Resource Concern #1: Special Status Species

Special status species are vital to maintain the biodiversity in the watershed. Only two species that are listed under the Endangered Species Act (ESA) are currently known to occur in the watershed, the bald eagle and gray wolf. Transient grizzly bears can also be expected to occur on the Rob Creek AMP in the future, as they expand out of the Gravelly Mountain range. All three of these species are currently listed as Threatened, no endangered species are known to occur in the BTW. A full list of special status species occurring in the BTW can be found in Table 7 of the BTW Assessment Report.

Sagebrush and grassland habitat types are the dominant vegetation communities comprising 80% of public lands in the analysis area. Mountain big sagebrush is the dominant habitat type. Ten BLM sensitive species have been identified as occurring in forested or sagebrush habitats and associated riparian habitats within the BTW.

In Montana Westslope cutthroat trout (WCT) are currently listed as a special status species by the BLM and as a species of special concern by MT FWP. Genetically pure WCT have drastically declined in the area and are now limited to several small

populations located in the headwaters of Cottonwood and Jake Canyon Creeks. A recently discovered population of WCT in middle reaches of Alkali Creek is currently being tested for genetic purity. Remaining pure populations are a result of some form of barrier that has prevented introgression by rainbow trout. Four streams, Teddy, Rock, and Robb Creeks, also support populations of slightly hybridized WCT.

Within the BTW, the greatest current threat to native WCT is limited population segments found in restricted habitat that are at high risk of extinction from catastrophic events such as wildfire. Additionally, the threat of extirpation from non native eastern brook trout and hybridization from non native rainbow trout is an ever present threat to some populations. Table 9 in the BTW Assessment Report lists the fisheries streams within the watershed and the genetic purity of WCT.

None of the plants currently listed as endangered or threatened under the ESA are known to be growing on BLM lands in the Dillon Field Office. There is suitable habitat within the BTW for several BLM sensitive plant species, but to date only two of these plants have been found on BLM lands within the BTW. Wind River draba (*Draba ventosa*) is found in the high-elevation habitats occurring in scree and shifting talus slopes of Sunset Peak. Idaho sedge (*Carex idahoa*) occurs in subirrigated soils along stream reach BT2 of the West Fork of Blacktail Deer Creek and along stream reach BT41of Clover Creek. Heavy grazing and cattle trails were impacting both populations of Idaho sedge when they were recorded in 1997, and excessive hummocks and trailing impacts were documented in 2006. The population along BT2 is vulnerable to road improvement and construction. Additional discussion of special status plants including those species that may occur within the watershed is included under the "Uplands" and "Riparian and Wetland Areas" sections of the BTW Assessment Report.

3.2.4 Resource Concern #2: Recreational Opportunities and Public Access

There are approximately 62 miles of designated motorized vehicle routes within the BTW. The majority of those designated route miles are within the Sweetwater Hills and to the south on those BLM lands north of the Robb-Ledford and Blacktail Wildlife Management Areas (FWP lands). Additional designated motorized routes traverse BLM lands from Red Canyon to the Clover Divide. Although there are no motorized routes designated within the Blacktail Mountains WSA in this planning area, some unauthorized motor vehicle activity occurs, especially during the big game hunting season. Throughout the entire planning area, motorized access is made difficult due to restrictions across private lands from the county-maintained Blacktail Road

3.2.5 Resource Concern #3: Socioeconomics

There are nine individual ranches (permittees) currently permitted to graze livestock for a total of 6,858 AUMs on the allotments included in this EA. Meetings with these permittees indicate that these ranch operations have tightly woven public land grazing preferences together with private land management. In most cases, private land owned by the permittees is adjacent to and/or intermingled with these public land allotments. Changes in numbers of livestock, seasons of use, and/or increased labor inputs may have considerable economic impacts on individual operations. For a full analysis of Social and economic conditions for Beaverhead and Madison counties refer Proposed Dillon RMP and EIS Vol. 1 beginning on page 250.

3.2.6 Critical Element: 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 located a mixture of prehistoric and historic sites throughout the watershed. Historically, the BTW was occupied continuously from approximately 10,000 years ago.

The BTW contains a mixture of prehistoric and historic sites throughout. Prehistorically, the watershed contains primarily small habitation or procurement sites continuously occupied from approximately 10,000 years ago until the early 19th century. Historically, the watershed was settled during the fur trade in the 1830s. Early ranching in the region began in 1864 when the Poindexter and Orr Ranch (later the Matador) started ranching an estimated 36,000 acres of land in the Blacktail Deer Creek drainage southeast of Dillon. A stage stop was located near the P & O ranch buildings for the Helena to Corrine, Utah stage route which traveled through the watershed providing transportation to and from Virginia City and Utah. Mining has occurred in the watershed as well, but to a lesser extent in respect to the rest of the Dillon Field Office.

3.2.7 Critical Element: Wilderness Characteristics

Blacktail Mountains Wilderness Study Area (WSA) contains a total of 17,479 acres, of which approximately 75% is within the Blacktail Watershed planning area. The entire East Fork Blacktail Deer Creek WSA (approximately 6,230 acres) is also within the planning area. Any changes in management, including potential range developments, changes in livestock management, prescribed fires or forest health treatments, road management issues, etc. should be evaluated to ensure that they do not impair the wilderness character of the WSAs. Wherever possible, and consistent with other management objectives, management actions should enhance the wilderness character of the WSAs.

4.0 Environmental Consequences

4.1 Introduction

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

4.2 Predicted Effects of Alternatives

Biological Evaluations (BE) are in the project file for Special Status Fish and Wildlife Species and Special Status Plants. A summary of whether or not special status plant and wildlife species are affected by the proposed alternatives is provided in the BE's along with a discussion of predicted effects and potential impacts to affected individual special status species and their habitat.

4.2.1 Predicted Effects Common to All Alternatives Including the No Action

Term Grazing Permits will be renewed with the current terms and conditions on the 12 allotments that were determined to be meeting Land Health Standards and had no identified site specific concerns. These allotments include Blacktail Ridge AMP, Kent Non-AMP, Robb Creek, Axes Canyon, Bench Field SGC, Red Canyon Isolated, Rock Creek, Robb Creek Non-AMP, Spear Place, Sweetwater Isolated, Timber Creek Isolated and Wire Field SGC. Current management is facilitating/allowing healthy conditions on BLM administered public lands within these allotments.

Human activities, such as road maintenance activities, recreation, gravel mining, and other disturbances, as well as livestock, wildlife, wind, water and fire have the potential to spread weeds into and within the watershed.

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

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

Proper salting improves both distribution and utilization. Although strategic salt placement is an inexpensive and effective distribution tool, recent 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).

TR 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 it can lead to improved riparian conditions that benefit fisheries and wildlife while improving water quality. Livestock can be moved away from critical habitat at critical times to minimize social displacement of wildlife (e.g. elk and deer winter range, fawning sites) "(Mosely 1999)".

Issue #2: Upland Health, Upland Habitat and Associated Species

Continued livestock grazing will affect composition of vegetation due to dietary preference and selectivity of forage. Depending on objectives, this affect may be considered positive or negative.

On the Sweetwater side of the watershed, Douglas-fir and Rocky Mountain juniper will continue to slowly expand into grassland/sagebrush uplands.

On the Blacktail side of the watershed, Douglas-fir will continue to expand into aspen, sagebrush, and mountain meadow habitats and compete for limited moisture and nutrient resources. With a continued lack of fire, mountain big sagebrush/grasslands will become more homogeneous as Douglas-fir trees expand (Heyerdahl et al, 2006). With lack of

disturbance, density of Douglas-fir within stands will continue to increase, and fires will be more likely to be higher intensity and larger in size that those that historically occurred. Mountain pine beetle and white pine blister rust will continue to infect and kill limber pine. Some limber pine habitats may become non-existent over time. This could reduce vegetative diversity across the landscape and may lower vegetative cover, water yields, wildlife, and aesthetic values (Arno, 2000). Spruce budworm activity will likely continue to increase and predispose trees to attacks by other insects or disease. Unless winter temperatures decrease enough to cause bark beetle mortality, populations of Douglas-fir bark beetle, mountain pine beetle, and balsam bark beetle will likely increase and cause additional mortality to Douglas-fir, lodgepole pine, and subalpine fir.

Resource Concern #1: Special Status Species

Signing for bear awareness in the East Fork of Blacktail Deer Creek campground would help minimize human – bear conflicts. Amending grazing permits to state that livestock losses may occur from carnivores will create awareness and minimize conflicts between permittees and agencies responsible for managing the re-introduction of large carnivores. Sheep are permitted on the Rock Creek allotment which could create a conflict if grizzly bear populations expand in the future. A BE is in the project file with further detail on T&E wildlife species. Predicted effects under all alternatives are not expected to effect any T&E species.

Known populations of sensitive plants that are found in upland or alpine habitats in the BTW aren't affected by current management activities and won't be affected by proposed management changes. Rare plant occupancy of some riparian and wetland habitats, particularly those in NF and FAR condition, may be limited by competition with non-native plants and altered hydrologic regimes. Surveying for sensitive plants in high probability habitat prior to surface disturbance and mitigating any adverse impacts would reduce the possibility that sensitive plant species would be accidentally or inadvertently impacted by proposed projects or vegetation treatments.

All of the WCT populations in the BTW are classified at high risk of extinction due to limited population segments in restricted habitat. As a result, impacts that put these populations at additional risk must be mitigated. Competition with non-native trout and the current drought cycle will continue to affect WCT habitat throughout the watershed is expected to continue under all alternatives.

Resource Concern #2: Recreation Opportunities and Public Access

Impacts are described under each alternative below.

Resource Concern #3: Socioeconomics

The BLM does not have access to financial or business records for permittees that 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 2007 BLM AUM cost is $1.35 while private land lease rates in Montana for 2007 average $16.20/AUM.

Economic impacts to area businesses and commercial operations associated with hunting opportunities 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.

Critical Element: Cultural Resources

Impacts are described under each alternative below.

Critical Element: Wilderness Characteristics

Managing the Blacktail Mountains and East Fork Blacktail Deer Creek WSAs in accordance with the Interim Management Plan and Guidelines for Lands under Wilderness Review will ensure wilderness values are not impaired.

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

Under this alternative, site-specific objectives would not be met and some allotments would continue being out of conformance with the Standards for Rangeland Health (43 CFR 4180).

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

The No Action Alternative would not accomplish riparian, wetland or aquatic objectives along stream reaches or at springs where resource concerns have been identified Alteration of stream morphology (channel shape and gradient), composition, cover, structure, conifer encroachment (in most cases Rocky Mountain juniper) vigor of streamside vegetation (specifically aspen, willows and sedges) and excess sediment input would continue. Excessive wetland hummocking and drying, where wetlands are adjacent to streams, would continue in places where it is occurring. Dysfunctional spring developments would not fulfill their purpose to draw livestock off riparian areas. Spring exclosures in disrepair would not fulfill their purpose of protecting spring sources.

Some riparian and wetland habitats would continue to be subjected to heavy or improper grazing under Alternative A. Continuing the current authorized grazing on FAR and NF riparian habitats would perpetuate heavy utilization of woody and/or herbaceous vegetation and/or streambank impacts from trailing. Limited cover, plant species diversity dominated by less desirable woody and herbaceous species, and low structural diversity that limit wildlife uses would be sustained on some streams. Small areas of riparian habitat associated with isolated springs, both developed and undeveloped, would continue to be impacted by authorized livestock use.

Juniper would continue to increase. This would cause a decrease in deciduous woody vegetation, primarily aspen, willow and red-osier dogwood, a narrowing of the riparian zone; create more bare ground, erosion, entrenchment and sedimentation.

Existing riparian functional conditions would be expected to remain static, or where increasing juniper was determined to be a primary cause of FAR conditions, would continue to decline under this alternative. Impacts and trends to fish habitat under Alternative A would remain the same as currently occur. Fish habitat in an upward trend, downward trend or static would likely continue along that path. In situations where habitat conditions are limiting populations, habitat requirements for fisheries would not be met.

Issue #2: Upland Health, Upland Habitat and Associated Species

Under Alternative A, the decreasing trend of cool season grasses on the allotment not meeting the Upland Standard (Spring Brook) and other isolated areas would continue. There would be no improvements in cover and no reductions in soil erosion where these concerns were identified. Progress would not be made towards meeting PFC or site specific objectives under Alternative A on the Spring Brook allotment and other pastures or localized areas within the watershed where upland health concerns were identified.

Repeated annual defoliation during the early and mid growing season, particularly during early flower development, usually has the most negative impact on cool season herbaceous plants growing in the intermountain sagebrush steppe (Daubenmire 1940, Stoddart 1946, Blaisdell and Pechanec 1949, Heady 1950, Wilson et al. 1966, Mueggler 1967b, Trlica and Cook 1971, Harris and Goebel 1976). Because of dietary preference, spring grazing by cattle gives unpalatable shrubs or low production grasses a competitive advantage over cool season perennial bunch grasses. The sensitivity of these grasses to grazing may be as much or more due to the competitive interaction with ungrazed or warm season species such as sagebrush or blue grama, respectively. The effect of selective grazing on interspecific competition may override a plant species tolerance to grazing (Archer and Teizen 1986). Grazing avoidance-type plants often gain the competitive advantage over grazed plant species (Archer and Smeins 1991).

Current grazing treatments (season long or long duration) that limit the availability of succulent forage, cover, and residual herbaceous vegetation may affect nesting sage grouse and other ground nesting birds, and small mammals, specifically in areas close to water sources.

The effect of projects such as fences and water developments on the landscape would not change under this alternative, maintaining a relatively open un-fragmented aspect to the BTW as a whole.

Resource Concern #1: Special Status Species

T&E wildlife species are discussed under Section 4.2.1 “Common to all Alternatives.”

Management actions would not be implemented to “enhance” sagebrush dependent species under this alternative. One of the goals of the *Management Plan and Conservation Strategies for Sage Grouse in Montana* (draft July 2002) is to “Manage grazing to maintain the soil conditions and ecological processes necessary for a proper functioning sagebrush community that addresses the long term needs of sage grouse and other sagebrush associated species.”

Fences that are not meeting BLM specifications would not be modified and would continue to impede wildlife movements and may cause mortality.

The Sweetwater AMP allotment currently has no seasons of rest and the pastures are used twice a year, for a total of 40-50 days. As a result, the riparian habitat has been degraded for all wildlife uses. Because of this use and exclusion of fire, juniper has moved into much of the riparian zones and replaced the riparian woody species. Without a change in the current management with rest built into the grazing system these conditions would persist. Upland sagebrush habitats are currently meeting requirements for sage grouse nesting, but is lacking in good quality brood rearing habitat due to the condition of the riparian zones.

Impacts identified within the riparian corridors would not be addressed. None of the juniper encroachment would be treated, therefore the riparian conditions would decline. Impacts associated with livestock would not be addressed and may not be meeting the sage grouse brood rearing habitat needs in riparian habitats an or adequate residual cover for nesting habitat on some allotments.

Conditions and trends to WCT habitat under Alternative A would remain the same as currently occur. Habitat in an upward trend, downward trend or static would likely continue along that path. In situations such as found in upper Teddy Creek, where habitat conditions may be limiting populations, habitat requirements may not be met. In streams with WCT habitat in PFC, such as Cottonwood Creek and Jakes Canyon, habitat needs are being met.

Continued heavy grazing of floodplains and wet meadow habitats, especially those supporting herbaceous plant communities, can alter the hydrology, energy flow and soil moisture regimes of these habitats which limits their ability to support rare native plants. Heavy grazing and cattle trails would continue to impact both known populations of Idaho sedge.

Resource Concern #2: Recreation Opportunities and Public Access

Some changes to recreational opportunities will occur as a result of the implementation of the motorized route designations that were made in the 2006 Dillon RMP. Those general changes are discussed in the Dillon RMP/EIS. In the BTW, it will cause a small reduction in the motorized use of some established routes on public lands. Although the designated routes will limit some motorized travel, it will improve users' ability to navigate in many areas through the signing of designated routes. The most significant changes to historical recreational use patterns for motorized users will continue to stem from actions taken on surrounding private lands where public motorized access has been greatly reduced in recent years. This is true for access to the Blacktail Mountains from the north and east and access to the Sweetwater Hills from the west.

The implementation of the RMP travel management strategy will also reduce conflicts between users by allowing non-motorized users an opportunity to access locations that are less likely to be disturbed by motorized use.

Resource Concern #3: Socioeconomics

Under Alternative A, forage availability and number of authorized AUMs is expected to continue at current levels and economic contributions attributed to livestock use of BLM lands would continue at current levels. Cattle grazing on 53,100 acres of public lands would provide 6,858 AUM's of forage in Beaverhead and Madison Counties. The dependency of livestock operators on BLM forage would remain unchanged. BLM forage often provides a critical element of the livestock producer's matched complement of grazing, forage, and hay production. Since there would be no change in the authorized level of grazing use, this would not contribute to changing the real estate value of base properties. This was analyzed in further detail for the Field Office under Alternative A. in Chapter 4 (p 316) of the Proposed Dillon RMP and Final EIS.

Critical Element: Cultural and Paleontological Resources

Current impacts to cultural and paleontological resources would be expected to continue.

Critical Element: Wilderness Characteristics

Wilderness characteristics within the Blacktail Mountains and East Fork Blacktail Deer Creek WSAs would continue to be maintained, and could be slightly improved, under this alternative. Impacts caused by unauthorized off-road vehicle activity are expected to be reduced by the signing of designated motorized routes and improved compliance. The recent limitations on motorized access across private lands to the north and east side of the Blacktail Mountains WSA has already reduced recreational impacts along vehicle ways within the WSA, including impacts from camping and campfires, trash, and vehicle impacts.

4.2.3 Predicted Effects Common to Alternatives B and C

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

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

No matter which grazing treatment (alternative) is selected, successful riparian management ultimately depends on the livestock managers' cooperation or support of the grazing management plan (Erhart and Hansen 1998, Evans Draft). Ehrhart and Hansen (1997) analyzed 71 stream reaches located throughout Montana, rated as functioning properly or in an upward trend. They found that the operators employed the full range of seasons of use as well as lengths of grazing periods and concluded that "the manager is more important than a particular approach". 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.

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. Limiting use of upland forage to 50% during spring and summer treatments should benefit water infiltration, plant vigor, reduce soil loss through overland erosion and leave adequate residual cover and forage for wildlife. A 4" or 6" sedge stubble height guideline (as applicable) should benefit stream channel morphology by reducing impacts to streambanks and bank-holding riparian vegetation in most areas, but is not expected to initiate significant progress toward meeting PFC on its own. Clary and Leninger (2000) recommend a 4" residual stubble height as a starting point for improved riparian grazing management while acknowledging that 6" of stubble height may be required to reduce browsing of willows or limit trampling impacts to vulnerable streambanks. Excessive wetland hummocking and drying is expected to be reduced where wetlands are adjacent to streams. Improvements in stream channel morphology and reduced impacts to streamside wetlands would reduce sediment input associated with channel erosion.

Ensuring adequate flows are retained for maintenance of wetland hydrology and fencing springs sources and associated wet meadows when developing water for livestock would conserve habitat for rare plants in the vicinity of developed springs and improve existing habitat for wildlife. Installing wildlife escape ramps in all water troughs would minimize mortalities to small mammals and avian wildlife, as well as provide clean drinking water. Design features for spring developments listed in Section 2.3.3 would mitigate the potential of spring developments drying up or decreasing wetland areas associated with spring sources.

The construction of fences and water developments/exclosures throughout the BTW would allow better livestock control, distribution and management. These improvements would also increase the level of human intrusion on the landscape, increasing localized habitat fragmentation. The greater intensity of human activity needed to meet guidelines or management strategies may increase potential wildlife disturbance or displacement on a localized basis and/or short term basis.

Water development in upland areas that lack water is often a key factor in reducing livestock concentrations in riparian areas. The proposed water developments would improve site conditions at spring sources by fencing the source and developing offsite water sources. Fencing the source would protect the associated habitat in the immediate vicinity. A common effect within riparian or spring exclosures in southwestern Montana is an increase in Canada thistle. New exclosures would need to be monitored for noxious weeds and treated where necessary.

The development of offsite water is expected to reduce trailing along streams and grazing/loitering in the riparian zone. Clawson (1993) found that installation of a water trough substantially reduced the duration of use of a perennial stream and also reduced the use of a spring in the same pasture. Cattle watered out of the trough 73.5% of the time, compared to only 3% from the stream and 23.5% from the spring. Reducing the duration of riparian area use would vary depending on water location and topography, but is expected to help improve channel morphology and increase composition of deep rooted

riparian vegetation along the greenline. 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. The planned spring developments could de-water low flowing springs and decrease the available riparian habitat if no overflow is available to be returned back into the channel. Obtaining flow measurements prior to developing these springs would provide important feasibility data that would be used in the engineering design. Augmenting the water development with shade, such as placing the watering trough near existing juniper trees, would also help to reduce the time livestock spend in riparian areas (TR-1737-20, 2006).

Proposed water developments in the uplands have been designed primarily to reduce impacts to riparian areas, and would allow broader livestock distribution and more dispersed utilization on upland forage plants. Impacts associated with new water developments would include:

- Soil and vegetation disturbance during construction activities and increased utilization and disturbance within ½ mile of the new watering locations.
- Loss of vegetation from concentrated livestock use in the immediate vicinity of the watering trough.
- Increased potential for invasive herbaceous plant species such as houndstongue, knapweed, or cheatgrass in the disturbed areas.
- New two-track ways, along the pipeline route. Use would be authorized on these routes for administrative and maintenance purposes by permit holders and BLM employees only.
- Distribution of use would be changed to more use of upland forage plants and less use of riparian vegetation.

Construction of a drift fence to prevent unauthorized livestock use along stream reach BT-2 on the West Fork of Blacktail Creek would eliminate hot season use on the allotment and result in improved streambank stability and increased deep-rooted riparian vegetation (sedges, willows). This should reduce sediment input from livestock and lead to slightly higher quality spawning habitat and better pool formation which would benefit the fishery. Without improvements in road maintenance the Blacktail Road would continue to contribute the majority of sediment that enters the stream, improvements to fish habitat may not occur.

Revised livestock management on the Blacktail Road Trail, Timber Creek AMP, Sweetwater AMP, Spring Brook, Spring Brook Isolated, Sweetwater Basin, Red Canyon and Steamboat Allotments is predicted to improve riparian vegetation, stream channel morphology and sediment transport at varying degrees and timeframes. 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." Myers (1989), reviewing 34 allotments in southwestern Montana, concluded, "duration in grazing treatments becomes a key factor in determining the severity of damage". Shortening the duration of treatments, providing or increasing rest or deferment, and/or constructing off-site water developments is expected to facilitate improvement of the vegetative component along the riparian areas within these eight allotments. Stream channel morphology should also improve in most areas, albeit at a slower rate because physical changes require more time than vegetative changes. An upward trend in riparian vegetation vigor and streambank stability is expected on streams that were FAR or NF.

Treatment of juniper in specified riparian areas is expected to increase deep-rooted riparian vegetation which would be followed by stream channel improvements. Treatment of western juniper using chainsaws and/or herbicides in riparian zones in northeastern California and western Nevada was followed by "greater than expected" release of deep rooted herbaceous and deciduous woody vegetation within three years (pers. comm. 2007).

Removing juniper in the riparian zones may cause a slight shift in use by migratory bird species. Treating less than 1% of the juniper is not expected to have substantial impacts. Dewatering of the riparian zones associated with increased juniper has a larger impact. Restoring deciduous riparian woody species is expected to have a beneficial impact to riparian health as well as wildlife/fisheries habitat. Soil disturbance during manual treatment of juniper may allow localized increases of cheatgrass or noxious weeds (houndstongue, Canada thistle).

Issue #2: Upland Health, Upland Habitat and Associated Species

On the majority of BLM uplands within the BTW, utilization of upland forage plants was found to be less than 50% under current management. For areas where upland utilization levels was an identified concern, managing for <50% livestock utilization in the uplands is expected to enhance residual herbaceous cover and herbaceous plant community composition, dependent on the season of use. Earlier grazing treatments may allow sufficient time for plant regrowth while later deferred treatments may enhance seedling establishment and species composition. Utilization patterns within a pasture are not uniform and livestock-preferred areas would generally sustain higher levels of use while other areas may receive less utilization. Livestock distribution is influenced by distance from water, topography and season of use. Improvements in cover would improve infiltration, and reduce soil erosion, overland sediment transport, and sediment delivery to streams.

Increasing growing season rest and shortening the duration of use on the Spring Brook allotment and other localized areas is expected to improve upland health by increasing vigor, cover and density of cool season bunchgrasses.

With the exception of the range improvement projects that would be removed, existing improvements would remain permanent features within the watershed. Fence modifications would be made to existing fences not meeting BLM specifications which is

expected to reduce the conflicts with wildlife movements and mortalities. Modification of wildlife barrier fences would facilitate seasonal movements by elk, mule deer, moose and antelope throughout the watershed, particularly for young of all species. Adjusting wire spacing, removing wires or providing gaps would allow animals to more easily pass over or under these fences with a reduced risk of entanglement, stress, mortality and damage to the fence. Any new fences may impede wildlife movements. This would be mitigated with the requirement that all new fences would be constructed to BLM specifications to reduce conflicts. Some mortality would still be expected to occur from entanglement of big game as well as game birds and birds of prey.

Water troughs, mineral placement, and trailing along fences would cause some localized impacts to vegetation that would be considered incidental. The proposed water developments are designed to improve livestock distribution. These developments would change utilization patterns so that more use would occur on upland forage plants and less in riparian areas. The water troughs may also provide increased water distribution for wildlife if they are available for wildlife when livestock are not present. Increased forage utilization causing vegetation impacts (changes in composition) can be expected within ¼ mile of new water troughs due to concentrated livestock use within close proximity to these watering locations.

Resource Concern #1: Special Status Species

T&E wildlife species are discussed under Sect. 4.2.1 "Common to all Alternatives."

Blacktail Road Trail-
Under Alternatives B and C up to 600 trailing cow/calf pairs could spend up to twelve days in the allotment annually. Streambank trampling would remain a concern along stream reaches BT2 and BT41 and would likely continue to impact the habitat of Idaho sedge. Individual Idaho sedge plants in the Blacktail Road Trailing allotment could be grazed 3 different times (up to 3 days each) in the spring and 3 different times (1 day each) in the fall every year. Since cattle would be actively herded along the West Fork Blacktail Creek in section 35 (T12S, R6W) utilization on any vegetation including Idaho sedge along BT2 is expected to be minimal. Heavier utilization is expected along Clover Creek (stream reach BT41) since cattle would be allowed to over night near the Clover Divide and this area would also be grazed for an additional 15 days every year under Alternative B and an additional 15 days every other year under Alternative C.

Redeveloping Paskett spring and having reliable water on the east side of Blacktail Road would reduce impacts to Clover Creek while the cattle are overnighting during trailing and for the 15 day grazing period. The proposed drift fence would prevent unauthorized livestock from the neighboring state lands lease from grazing/loitering along BT2 during the hot season each year mitigating any impacts associated with hot season use.

Steamboat
Current management on the unleased stock driveway has created issues from livestock that are authorized on adjacent, unfenced state, private and BLM pastures accessing and utilizing the stock driveway. This has created resource concerns with the riparian habitat associated with Cooks Lake and other spring sources along Blacktail Stock Driveway.

This area is used extensively by sage grouse during summer and brood rearing. Overall sagebrush conditions are good, but riparian brood rearing habitat has been degraded. Under Alt. B & C, construction of a riparian exclosure around Cooks Lake would improve sage grouse brood rearing habitat as well as seasonal use for all wildlife.

Resource Concern #2: Recreation Opportunities and Public Access
Impacts are described under each alternative below.

Resource Concern #3: Socioeconomics

Shortened or changed authorized use periods by pasture or within the allotment(s), incorporating additional rest or deferment, and/or reducing numbers of livestock would necessitate using private pastures or other areas for longer periods or at different times or reducing herd size. Additional range improvement projects would add increased construction and maintenance expenses for the permittees and the BLM. Authorized AUMs would change in some allotments as shown in Table 5, Chapter 2. In addition, use guidelines in the uplands and riparian areas may necessitate increased labor inputs by the permittees in order to harvest authorized AUMs. During periods or years of drought, total authorized AUMs may not be available for harvest. Socioeconomics was fully analyzed under Alternative B in Chapter 4 pp 331 of the Final EIS for the Dillon RMP.

Critical Element: Cultural Resources

Any direct impacts to identified cultural or paleontological resources resulting from proposed range improvement or vegetation treatment projects would be avoided through project redesign or abandonment. Changes in grazing management to meet the Standards of Rangeland Health would be expected to provide a corresponding benefit and improvement of conditions at approximately 20% of the previously recorded cultural properties (see discussion in Section 3.2.5).

Critical Element: Wilderness Characteristics
Impacts are described under each alternative below.

4.2.4 Predicted Effects of Alternative B

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

Blacktail Road Trail –
The proposed trailing use is substantially less than it has been in the past and is expected to allow for improved riparian health by reducing the amount of time livestock have access to the streams (BT-2 and BT-41). Redeveloping Paskett Spring to provide off-site water and authorizing up to 15 days of fall use only is expected to facilitate improvement to streambank stability and riparian vegetation along the greenline, especially herbaceous vegetation. East Clover Creek would be incorporated into this allotment and proposed use is expected to improve riparian conditions along stream reach BT-144 (East Clover Creek trib.). BT144 was found to be FAR with an upward trend when it was assessed during the Centennial Watershed Assessment in 2004. This reach is not accessible by trailing livestock so would be used by livestock for up to 15 days in the fall.

Spring Brook-
Reducing the duration of treatments, creating Pappys Gulch riparian pasture, adding additional deferment and developing several new off-site watering sites is expected to mitigate riparian concerns in the Spring Brook Allotment. The potential advantages of deferred and rotational deferred grazing are explained in TR-1737-20 (2006, pg 47) where it states "The grazing season is shorter and changes in the timing, frequency, and intensity of grazing decrease the likelihood of multiple defoliations of desired riparian plant species, allowing for longer periods of plant recovery. Livestock may be less selective in pastures where use is concentrated into shorter periods."

Kovalchik and Elmore (1991), indicated that deferred rotation grazing systems are moderately compatible for willow-dominated plant communities (highly compatible for sedge management and showed no change to highly compatible for willows depending on duration of season and topography). This is applicable to RU-84 in the Lower Virginia Pasture. In addition, the off-site water developments within the Lower Virginia Pasture are expected to reduce livestock impacts to RU-84.

Authorizing yearlings only in the Wood Canyon Pasture would improve distribution from the riparian into upland areas. Yearlings range better and spend less time in the riparian zone than cow/calf pairs. Early season use is also expected to improve riparian conditions partially because of the time allowed for regrowth after plants have been grazed. Platts and Nelson (1985a and 1985b) observed that livestock distributed themselves better throughout pastures and concentrated less in riparian areas during the early season. Both Crouse (1987) and Elmore (1988) reported improvements in riparian areas as a result of grazing them only in the spring. Clary and Webster (1989) state that "Spring grazing of riparian areas has several advantages. Grazing early usually results in a better distribution of use between the riparian area and adjacent uplands. This is likely due to more similarity in vegetation succulence between riparian and upland areas than would be the case later in the season and cooler temperatures in the early season."
One rest cycle every six years within the Wood Canyon Pasture would allow some periodic recovery of cool season plants, but may not maintain the current composition of cool season plants.

Riparian conditions along RU-83 are expected to improve relatively quickly by authorizing use in the Pappy's Gulch Riparian Pasture once every three years for up to three days anytime during the authorized use period, except during the hot season (7/15 – 9/15). The time of exposure to livestock impacts would be three days once every three years. Kovalchik and Elmore, (1991) included "riparian pasture" in the systems highly compatible with willow management and indicated that willows and sedges both respond very positively under this management strategy.

A common effect within riparian exclosures in southwestern Montana is a substantial increase in Canada thistle. "Proper livestock class and stocking rates can help prevent weeds from encroaching on riparian areas. Short duration-high intensity livestock grazing (such as a riparian pasture) forces livestock to graze weeds as well as desirable riparian vegetation. This helps maintain a balance between plant species within the riparian plant community" (Shely, Mullin and Kay, 1995). By allowing livestock grazing

use once every three years, it is predicted the Canada thistle would remain at current levels and not out-compete existing vegetation and increase within the riparian pasture.

Sweetwater AMP-
Changing the season of use from 5/1 – 11/30 to 6/10 – 11/10, implementing a 3 pasture rest rotation grazing system in pastures 2, 3 and 4 and a deferred grazing system on pasture 1, and adding additional off-site water on private and public land is expected to improve riparian health throughout the allotment. The rest rotation grazing system in Pastures 2, 3, and 4 would improve riparian conditions, specifically deep-rooted herbaceous vegetation. Streams would subsequently begin to narrow. Under current management, these pastures have been used twice every season for 20-30 days each treatment. The proposed rest rotation system allows one year of complete rest every three years to allow seedling establishment and enhance vigor of forage plants. Kovalchik and Elmore, (1991) showed generalized relationships between grazing systems and willow and sedge response on willow-dominated plant associations. They indicated that rest rotation grazing systems are moderately compatible for these types of plant communities (highly compatible for sedge management and showed no change to highly compatible for willows, depending on the length of the fall season). Early fall use would occur in pastures 2, 3 or 4 one in three years during the late treatment (8/9 – 9-22).

Fall use of up to 30 days (10/10 – 11/10) annually in Pasture 1 is expected to improve channel morphology and increase herbaceous riparian vegetation. The primary advantages of late season grazing are that soils are drier, which reduces the probability of compaction and bank trampling; most plants have completed their growth cycle, and grazing would not adversely affect plant development. Willows may be impacted on a localized basis, but are expected to be maintained within the pasture. Livestock access along the lower reaches of Elk Gulch and Little Elk Gulch is limited due to the deeply entrenched channels. Use of low-moisture protein blocks as a supplement in the uplands would mitigate browsing on willows and other palatable woody vegetation. Bailey, et. al. 2001, showed that placing dehydrated molasses (protein) supplement in undergrazed rangeland was an effective tool to modify cattle grazing distribution (from riparian to upland areas) during late summer, autumn, and winter.

Repair of existing spring developments and construction of new developments as well as associated exclosures would protect spring sources and draw livestock off riparian areas. Revisions to livestock management would provide more rest, more deferment, and/or shorter use periods to riparian areas and facilitate recovery of riparian vegetation. Over time stream channels would deepen and narrow.

Within the Moose Creek drainage, treatment of juniper would result in more sunlight reaching the soil surface and a release of resources (water, soil nutrients) that were being used by the juniper. Desirable remaining vegetation would reestablish. The rate of re-establishment would be somewhat dependant on how much desirable vegetation currently exists along with the juniper. Channel roughness would increase. Soil erosion and channel erosion would decrease. Likewise, sedimentation would decrease. Untreated areas would be as described in the No Action Alternative.

Treating up to 83 acres of juniper in Moose Creek would meet the objective of restoring riparian function by increasing deep rooted deciduous woody and herbaceous vegetation within the treated reaches. The reaches identified for treatment have an estimated 55-85% (2006 MRWA) canopy cover of juniper. Remnant willow, aspen and red-osier dogwood are expected to flourish with the removal of the juniper improving hydrologic functions. Additionally, juniper reduction in drier locations would facilitate increases in grasses, forbs, and shrubs, improving overall upland conditions adjacent to the stream which would reduce sediment input into the stream channel. Channel evolution would continue as streams seek a stable state. These changes would result in an improvement to fisheries habitat which would potentially allow for a healthier fishery in the upper reaches of Moose Creek.

These treatments would be beneficial to wildlife by maintaining a healthy functioning riparian system, improving sage grouse brood rearing habitat, raptor and song bird nesting habitat and big game habitat. Removal of juniper may slightly reduce hiding cover for big game; however the juniper would remain on sight and provide some cover until the deciduous species get re-established. The trees that are mechanically removed with chainsaws would be oriented in the corridor to detour livestock and wild ungulates from accessing and/or loitering in these riparian zones and allow for woody and herbaceous species to get established. Seeding with native grasses may be necessary following treatments to re-establish the herbaceous understory that is currently lacking.

Juniper encroachment/expansion in the riparian zone was also identified as one of the causes of not meeting the riparian health standard on reaches RU13A, RU13B, RU13C and RU14 (Little Elk Gulch) and RU12 and RU12A (Elk Gulch). Juniper treatment would not occur in these reaches under this alternative and juniper would continue to increase. Expansion of juniper in these areas would continue to dry and narrow the riparian zones and replace deep rooted riparian vegetation such as willows, aspen and sedges. Soil erosion would be accelerated increasing sediment input to these reaches.

Red Canyon-
Constructing an exclosure around the spring complex (BT298) and providing off-site water would eliminate livestock impacts to these springs and associated wetlands. Relatively quick vegetative response is expected. The off-site water would also mitigate excessive use adjacent to the stock ponds in the bottom of the drainage.

Sweetwater Basin-
Reducing the duration of use from 40 days to 31 days, enclosing the spring area, piping overflow water back into the natural channel, and changing the season of use from the "hot season" 7/4 – 8/12 to either dormant season (up to 31 days between 9/1 – 10/31) or early season (up to 31 days between 6/1 – 7/15) is expected to improve the riparian/wetland conditions at RU173.

Cattle distribution is expected to improve into the uplands during the fall or early summer seasons, therefore reducing use along the riparian zone proportionately. Greenline vegetative (sedge) cover is expected to increase and trampling impacts along the spring brook are expected to decrease. The spring source and associated wetland would be enclosed, so livestock impacts would be eliminated.

One of the most important advantages of late season grazing is that for many herbaceous species seed set has already occurred, and defoliation will have less impact that during earlier development stages (Kaufman and Krueger 1984; Gillen and others 1985). In addition, with adequate precipitation, regrowth of upland forage may draw cattle out of the riparian bottoms. Also, fall grazing occurs when soil moisture is reduced which is expected to mitigate trampling impacts along RU173.

Platts and Nelson (1985a and 1985b) observed that livestock distributed themselves better throughout pastures and concentrated less in riparian areas during the early season. Both Crouse (1987) and Elmore (1988) reported improvements in riparian areas as a result of grazing them only in the spring. Clary and Webster (1989) state that "Spring grazing of riparian areas has several advantages. Grazing early usually results in a better distribution of use between the riparian area and adjacent uplands. This is likely due to more similarity in vegetation succulence between riparian and upland areas than would be the case later in the season and cooler temperatures in the early season."

Timber Creek AMP-
Reducing duration of treatments to 30 days and following a rest rotation grazing system in the School Section, Mine and Harp Pastures, along with the proposed off-site water developments is expected to improve riparian conditions throughout these three pastures. Only 15 days of hot season use would occur once every three years. Fall use would not occur in these three pastures. Willows and sedges are expected to increase under this system and overwidened channels would subsequently begin to narrow, except where juniper was noted as a primary cause for FAR conditions. Riparian health standards were met within the Taylor and Smith-Taylor Pastures, so changes were not proposed to existing use in these pastures. Riparian conditions are expected to be maintained in these two pastures.

Juniper encroachment/expansion in the riparian zone was identified as one of the causes of not meeting the riparian health standard on reaches RU48 and RU36. Juniper treatment would not occur under this alternative and juniper would continue to increase. Expansion of juniper would continue to dry and narrow the riparian zones and replace deep rooted riparian vegetation such as willows, aspen and sedges. Higher than natural soil erosion would continue to input excess sediment into these reaches.

Spring Brook Isolated -
Reducing the duration of use to a maximum of 16 days in the Spring Brook Pasture and 29 days in the Middle Spring Brook Pasture and changing the season of use to dormant season only is expected to improve deep-rooted herbaceous riparian vegetation and improve channel stability. The primary advantages of late season grazing are that soils are drier, which reduces the probability of compaction and bank trampling; most plants have completed their growth cycle, and grazing would not adversely affect plant development. Cottonwood regeneration would be impacted by browsing on reach RU101.

Steamboat-
Incorporating a large portion of the previously unleased (but not ungrazed) Stock Driveway into the Steamboat Allotment and including terms and conditions

(management) on this area along with the proposed projects would improve riparian habitat throughout the proposed Steamboat Allotment.

Implementing a deferred rotation grazing system would substantially reduce the amount of time that livestock currently has access to riparian zones within the allotment. Kovalchik and Elmore, (1991) indicated that deferred rotation grazing systems are moderately compatible for willow-dominated plant communities (highly compatible for sedge management and showed no change to highly compatible for willows depending on duration of season and topography). This is particularly applicable to BT95, BT70 and the spring/seep/wetland areas in Funnel Basin that are all herbaceous dominated riparian systems. Deferred use only would be authorized in the Cooks Lake pasture (9/1 – 10/31) which is expected to increase deep-rooted herbaceous riparian vegetation in the Funnel Basin area. The spring source(s) and associated lake and wetland habitat of Cooks Lake would be enclosed and an off-site watering trough would be installed approximately ¼ mile away. This would eliminate livestock impacts to the wetland habitat associated with Cooks Lake. The spring sources at Granny Springs would also be enclosed and off-site water provided which would eliminate livestock impacts to the spring source and mitigate impacts to the spring brook.

Issue #2: Upland Health, Sagebrush Steppe Habitat and Associated Species

Blacktail Road Trail-
Upland health standards were met in the Blacktail Road Trail Allotment. Short duration trailing use along with up to 15 days deferred use would maintain or improve upland conditions.

Spring Brook-
The Sweetwater Basin Pasture within the Spring Brook Allotment did not meet the upland health standard. Growing season use of cool season grasses is prescribed for 28 days during two 2 of 6 years in the proposed grazing system. Use after seed ripe or rest would occur during the other 4 years of the proposed grazing system. This use would allow vigor, composition and cover of cool season grasses to increase. “Combinations of rotation, deferment, and rest all seem to be beneficial provided they allow periodic protection from grazing during the critical period of spring plant growth” (Blaisdell and Holmgren, 1984). Increased production in these areas may provide additional forage or cover for wildlife. Increased cover and density of cool season bunchgrasses would also improve hydrologic processes by allowing better water infiltration and less run-off and erosion.

Proposed use in the Wood Canyon Pasture would occur during the critical growing season of cool season grasses during 5 out of 6 years. Although this early season use may improve riparian conditions, upland cool season grasses would be expected to decrease in this pasture under Alternative B.

Proposed use under Alternative B is expected to maintain/improve upland conditions in Upper Virginia, Honeymoon and Lower Virginia Pastures (pastures containing some BLM administered lands) because the proposed grazing system allows for periodic rest during the critical growing season in each of these pastures.

Sweetwater AMP -
The upland health standard was met within the Sweetwater AMP allotment. An overall improvement of upland health conditions is expected in pastures 1 (late fall use only), 2, 3, 4, (rest rotation) under the proposed grazing system, specifically near water sources. Upland health conditions are expected to be maintained in pasture 5 which would be grazing for up to 15 days in June and 15 days in late September/early October annually.

Impacts resulting from motorized vehicle use would be reduced under this alternative by closing approximately 2.7 miles of designated route in the Sweetwater Hills area. This route, which was designated open in the RMP is extremely steep and eroding from vehicle use and is infested with knapweed in the disturbed area of the route. This route may also be causing sedimentation into Elk Gulch. Closure of this route would slow the rate of erosion and the spread of knapweed, but may require physical rehabilitation to stop the erosion and gullies caused by past vehicle use. A ½ mile segment of road in the same area would be opened to motorized vehicles under this alternative to provide a loop route connecting portions of the closed route with other routes in the area. This route is well-defined, and not subject to the same resource problems as the segment proposed for closure.

Red Canyon-
The upland health standard was met within the Red Canyon Allotment, although vigor was low on some of the cool season grasses in some areas of the allotment. The Teddy Creek fire may have contributed to the low vigor of the vegetation. Upland health would be maintained under the current alternating deferred rotation system.

Sweetwater Basin-
The upland health standard was met within the Sweetwater Basin Allotment and is expected to be maintained or improved by changing the season of use to fall for three out of four years and reducing the duration of use.

Timber Creek AMP-
The upland standard was met within the Timber Creek AMP Allotment and is expected to be maintained or improved by following a rest rotation/deferred rotation system which would give cool season forage plants growing season rest 2 of 3 years in the pastures included in the rest rotation system and every year in the deferred pastures..

Spring Brook Isolated -
The upland standard was met within the Spring Brook Isolated Allotment and is expected to improve with late fall (dormant season) use and shorter grazing periods.

Steamboat-
The upland standard was met throughout the area that is proposed to be incorporated into the Steamboat Allotment. Upland health would be maintained in the Steamboat Pasture and improved in the Granny and Cooks Lake Pastures (near Cooks Lake) by implementing a deferred rotation grazing system in this area. Use in the Cooks Lake pasture would only occur after 9/1, whereas it has been occurring from about July 1 to the end of the grazing season. Early (growing season) use would be alternated between the Steamboat and Granny Pastures and has been occurring every year in the Granny Pasture.

Resource Concern #1: Special Status Species
T&E wildlife species are discussed under Sect. 4.2.1 "Common to all Alternatives."

Spring Brook-
A May 15 livestock turnout date is not ideal on the Sweetwater Basin pasture for sage grouse. However this pasture would be deferred until July 20 three out of six years and rested one out of six. The active lek on private and the immediate adjacent sagebrush habitat may not be capable of providing adequate nesting cover; therefore sage grouse are probably nesting in adjacent habitat to the north and west. During a telemetry study between 1999 and 2001, sage grouse from this lek moved 10 km to the north in 2000 and in 2001; two mortalities were found south of the lek outside of Sweetwater Basin (Roscoe 2002).

Wood Canyon would be used 25 days every 5 of 6 years between May 15 and July 15 with heifers. Yearling heifers should disperse better than cow calf pairs, although this early season use may improve riparian conditions, the stocking rate and only one year of rest in six may not be adequate to improve the existing riparian conditions. Current riparian conditions were meeting the standard and maintaining the existing water development would help to reduce livestock impacts to the streams. The May 15 turnout is not ideal for sage grouse during the nesting and brood rearing season, given the proximity to the lek.

Fencing reach RU 83, creating a riparian pasture on Pappy's Gulch that would be used for three days one in three years and removal of the non-functional water development would restore the riparian habitat and improve brood rearing habitat for sage grouse.

Upland habitat on public lands within most of the allotment was in fair to good condition. Developing the water at Honeymoon Springs and piping it to watering troughs should improve livestock distribution and reduce impacts to the private lands within the allotment. The improved distribution, along with shortened grazing seasons should improve winter forage for wildlife. The ground disturbance associated with the distribution pipeline would increase the probability for spread of noxious and invasive species in these disturbed areas. See cumulative effects (section 4.3) for how this allotment would be used in conjunction with adjacent state and private lands.

This area has a high concentration of breeding Ferruginous hawks. Nests are usually built on rock outcrops, where available. However nests are sometimes built on the ground. If this is the case, nest disturbance could occur, but is not expected to increase over current management.

Sweetwater AMP-
Using pasture one in the fall with dry cows (with out calves) should allow for better distribution. Riparian habitat has suffered in the past due to two grazing treatments per year during the hot season. As stated under Issue # 1 above, fall use for 30 days would allow herbaceous plants a full growing season, however browsing may occur on woody riparian species. A three pasture rest rotation and deferred use in pastures 2,3,4 would allow for residual hiding cover for sage grouse and pygmy rabbits as well as forage for

winter big game. Adding rest to a system that has been grazed two times a season would improve riparian habitat for sage grouse brood rearing and migratory birds. Uplands were found to be in good condition and providing adequate nesting cover for sage grouse. This alternative would ensure that existing upland conditions would be maintained or improve.

Red Canyon-
Fencing the source and piping water away from the associated habitat at BT 298 would improve habitat for sage grouse brood rearing. A May 10 begin date, with no rest, may not be conducive to sage grouse nesting due to proximity of an active lek to the south.

Sweetwater Basin-
Improving the design of the water development would influence use of sage grouse during brood rearing. Fencing the source would remove livestock impacts and allow for better water. As stated above under uplands, shortening the grazing season and changing to fall use three out of four years should improve riparian and sagebrush habitats for sage grouse, pygmy rabbits and winter wildlife use.

Steamboat-
The road designation on Blacktail Ridge at Clover Divide is not expected to have an impact on wildlife uses in the area. The route has been established and is used extensively during big game hunting seasons and does not get much use the remainder of the year. This use is not expected to change. Sagebrush and associated herbaceous habitat is being used extensively by sage grouse in the summer. Brood rearing habitat was impaired around Cooks Lake and nearby springs. Deferring use until 9/1 and fencing Cooks Lake would greatly improve brood rearing habitat and uses by all wildlife in the area.

BT31 (Teddy Creek) and BT62 (Teddy Creek trib) were found to be in PFC by the ID team during the summer of 2006. During the past several years, livestock have been hauled to the north end of the allotment and let out during early June. There is one existing fence, so the cattle were held in the lower country for about 30 days and then turned into the upper unit (southern portion). As soon as they were turned into the upper unit, they trailed up to the Cooks Lake area with little or no impact to Teddy Creek on the way past. Both Alt B and C propose a fence that would hold the cattle in the Steamboat Pasture from 30 or 45 days (Alt B) or 45 or 60 days (Alt C). Although this fence would allow livestock control and management (especially in the large Cooks Lake Pasture), without some means of livestock control, it would likely result in an increase over current livestock use in the proposed Steamboat Pasture and along Teddy Creek, which is occupied WCT habitat.

Constructing the Teddy Creek WCT exclosure would eliminate livestock impacts from BT31 and BT62. Excluding livestock from these stream reaches would allow for improved bank stability due to reduced trailing along the stream and an increase in deep-rooted riparian vegetation. Reduced sediment input is also expected which would improve spawning site conditions. Improved streambank stability and increased riparian vegetation condition would provide more security habitat in the form of overhanging banks and increased overhanging bank vegetation. Combined, these conditions would

result in improved habitat conditions for WCT and would sustain a more robust headwater population. This stream reach would act as a buffer to any loss in individuals in the downstream populations. Livestock may be used as a tool periodically for a very short period (up to 3 days) if/when it is determined that this use would to assist in meeting resource objectives, such as Canada thistle control or reducing stagnant cool season grasses. This use would not change the effects as described above.

Rock Creek-
Re-designation of routes in the Rock Creek allotment is not expected to have any impacts to special status species. No ground disturbance is associated with the designations. This is explained further under resource concern #2 below.

Remaining Allotments-
Management changes on the remaining allotments under this alternative are either not expected to have any impacts to special status species or special status species do not occur in those allotments.

Resource Concern #2: Recreation Opportunities and Public Access

A route along the Clover Divide from the Blacktail Road north to Cook's Lake would be designated open under this alternative. This nearly 5 mile route which follows the divide has obviously existed for many years, but was inadvertently excluded from the road inventory used in the RMP motorized travel route designation process. This route provides desirable recreational access, especially for big game hunters, and has minimal resource issues (erosion, etc.) due to its location on the ridge top. It also provides a logical connection to a route already designated open from Teddy Creek Road to the north. This route would be added to the base miles for the Dillon Field Office and designated open to motorized vehicle use. Regarding this action, the RMP states,

> "Evaluate 'existing routes' not included in the inventory base (and thus not considered in this plan) on a case-by-case basis through an environmental analysis process to determine whether they should be open to public travel. In order to be considered an existing route, the route must be able to be verified to have been present on the ground no later than the 2002 inventory season. Designate routes determined to enhance public access opportunities, and not in conflict with management of other resources as open and add them to the Southwest Interagency Travel/Visitor Map through routine plan maintenance. Continue to use the principles developed by the Western Montana RAC when considering travel management modifications" (RMP, P. 61, Action item #8).

Closing approximately 2.7 miles of designated route in the Sweetwater Hills area would address resource issues including erosion, weeds, and stream sedimentation. A short (1/2 mile) segment of road in the same area would be opened to motorized vehicles under this alternative to provide a loop route connecting portions of the closed route with other designated routes in the area. This route is well-defined, and not subject to the same resource problems as the segment proposed for closure. This proposed change would result in the loss of motorized access to a steep, rocky ridge above Little Elk Gulch.

Adjustments in the travel designations in the Rock Creek area to designate approximately 1 mile open to motorized use in exchange for approximately 1 mile of road to be closed would provide for public use of a better route. This allows continued access into the same area of public lands, and closure of a seldom-used route that is more susceptible to resource damage from vehicle use. These types of adjustments were anticipated, and provided for in the RMP where it requires that the BLM "Update and maintain the road and trail database to correct mapping errors and refine decisions" (RMP, p. 61, #5).

Resource Concern #3: Socioeconomics

Greater changes in current operations would likely have greater economic effects on the individual operators. Refer to analysis Common to Alternatives B and C under 4.2.3.

Critical Element: Cultural Resources

Refer to Common to Alternatives B and C in Section 4.2.3.

Critical Element: Wilderness Characteristics

Same as Alternative A.

4.2.5 Predicted Effects of Alternative C

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

Blacktail Road Trail-
Predicted effects of Alternative C would be similar to Alternative B. Incorporating rest every other year during the fall period would allow for a faster improvement to riparian health, specifically to willow canopy cover.

Effects to fisheries habitat in Blacktail Deer Creek would be similar to those described in Alternative B.

Spring Brook-
Effects of Alternative C would be the same as Alternative B for the Pappy's Gulch Riparian Pasture. Riparian condition improvement would be slower under Alternative C than B along RU84 in Lower Virginia Pasture because the duration of treatments is a longer (40 days vs. 22 days) and no additional off-site water would be developed. Riparian conditions are expected to improve more quickly in the Wood Canyon Pasture under this alternative than Alternative B because grazing periods are 15 days vs. 25 days and additional rest is incorporated into Wood Canyon in this alternative (1 year in 3 vs. 1 year in 6).

Sweetwater AMP-
Predicted effects to riparian habitat from livestock grazing would be similar to those described under Alternative B. Under this alternative, Pasture 5 would be incorporated in with pastures 2, 3, and 4 to implement a four unit rest-rotation system. Grazing periods would be 40 days vs. 45 days, and complete rest would occur every fourth year for each

pasture as opposed to every third year in Alternative B. Livestock numbers would be 400 vs. 450 under Alternative B. Improvements to riparian conditions are expected to be a little slower than under Alternative B because pasture would receive less rest. Effects to Pasture 1 would be the same as described under Alternative B.

Treating juniper in riparian corridors on Moose Creek, Elk Gulch, and Little Elk Gulch would have a greater benefit to wildlife than Alternative B. As stated under Alternative A and B, by increasing vegetation composition (deep-rooted deciduous woody and herbaceous vegetation vs. juniper), these proposed treatments would create a shift in uses by some wildlife species, but would restore the riparian health thereby maintaining or improving biodiversity in the Sweetwater Hills. Two reaches on Elk Gulch were identified for treatments due to the canopy cover of juniper in the understory (trace -15%, 2006 MRWA) and the mature overstory of willow and aspen that still remains. These reaches would be much easier and less expensive to treat at the same time as the lower reaches, before juniper becomes the dominant overstory and begins lowering the water table and causing a narrowing of the riparian zone. By dispersing the treatments throughout the watershed, on several different streams, use of these areas should also disperse and reduce the impacts from browsing. These treatments should all be completed within the same time period to meet this objective.

Predicted effects to the fish habitat in Moose Creek would be the same as those described under Alternative B. Elk Gulch and Little Elk Gulch are not fisheries streams.

Using the felled juniper as a deterrent to browsing animals would offer palatable woody and herbaceous vegetation protection while it is responding to the release of resources when the juniper trees are treated/removed.

Red Canyon-
Effects to riparian would be the same as described under Alternative B with the exception of the seeps/springs upstream from the stock dam. These areas would improve more quickly with a year of rest incorporated into this system during one of three years.

Sweetwater Basin-
The entire stream reach of RU173 on BLM administered land would be included in a riparian exclosure and the existing watering trough would be moved onto private land. Livestock impacts would be eliminated from this riparian habitat allowing relatively quick improvement along the portion of the stream on public lands, but likely concentrating use on the lower portion of the stream on private land.

Timber Creek AMP-
Under this alternative the Smith-Taylor, School Section, Mine and Harp Pasture would be incorporated into a four pasture rest rotation system and the Taylor Pasture would be used annually from 9/1 – 10/30. Each pasture would be used one year in four during the hot season for up to 30 days. Predicted effects are similar as described in Alternative B for the Mine, Harp and School Section Pastures although improvement may be slower because each area is rested one year in four vs. one year in three. Riparian conditions in the Smith-Taylor and Taylor Pastures would improve under this alternative because rest and less hot season use would be incorporated into the Smith-Taylor Pasture and

substantially less hot season use would occur in the Taylor Pasture.

Stream reaches RU36, RU48 and RU49A would be treated for juniper under this alternative. Effects would be the same as described above under Sweetwater AMP due to an expected increase in deep-rooted deciduous woody and herbaceous riparian vegetation.

Spring Brook Isolated-
Corridor fencing two short stream reaches on public lands (RU 100 and RU 101) would eliminate livestock impacts from these stream reaches on BLM administered lands.

Steamboat-
Riparian condition improvement would be similar to that described in Alternative B for Granny Springs and Cooks Lake. The Funnel Basin area would be included in a riparian pasture which would be used for up to 10 days one year in three. The spring/seeps within the riparian pasture would be expected to respond quickly with an increase in deep-rooted herbaceous riparian vegetation, increased cover and decreased trampling impacts in the wetland areas.

Issue #2: Upland Health, Upland Habitat and Associated Species

Blacktail Road Trail-
Predicted effects would be similar to those described under Alternative B.

Spring Brook-
Upland health is predicted to improve in all pastures under Alternative C. Incorporation of rest into Wood Canyon Pasture every third year vs. every sixth year (Alternative B) and reducing the duration of treatments would facilitate maintenance or increase in vigor, cover and composition of cool season bunchgrasses.

Sweetwater AMP-
Predicted effects to upland health would be similar to those described under Alternative B. with the exception of pasture 5. A four pasture rest rotation would result in improvement in the upland conditions in pasture 5, whereas existing conditions are expected to be maintained under Alternative B. (Upland Health standard was met).

Red Canyon-
Even though the upland health standard was met in the Red Canyon Allotment, the vigor of cool season grasses was low in localized areas within the allotment, partially due to the Teddy Creek Wildfire in 1999. Implementing a three year rest rotation would improve vigor, cover and composition of cool season grasses within the Red Canyon Allotment.

Sweetwater Basin-
Predicted effects to upland health would be similar to those described under Alternative B. except that moving the water trough down to private land would concentrate more use in the lower elevation areas of the allotment.

Timber Creek AMP-
Predicted effects would be similar to those described under Alternative B.

Spring Brook Isolated -
Predicted effects would be similar to those described under Alternative B.

Steamboat-
Predicted effects to upland health would be similar to those described under Alternative B in the Cooks Lake and Steamboat Pastures. The Granny Pasture would be divided into two units which would allow a shorter (22 days) and rotated grazing treatment during the growing critical growing season and would therefore would be more conducive to promoting cool season grasses in the Granny (and Corral) Pasture than Alternative B. The uplands met the upland health standard within the Steamboat Allotment.

Resource Concern #1: Special Status Species
T&E wildlife species are discussed under Sect. 4.2.1 "Common to all Alternatives."

Spring Brook-
Adding rest to Wood Canyon pasture every third year, using it 15 days and alternating the season of use would benefit riparian and sagebrush habitats. The later turnout date, fewer numbers of cattle, and shortened season of use would cumulatively benefit sage grouse habitat throughout the allotment. Fencing reach RU 83 and creating a riparian pasture on Pappy's Gulch that would be used for three days one in three years and removal of the non-functional water development would restore the riparian habitat and improve brood rearing habitat for sage grouse. This alternative would be preferred for sage grouse since the Sweetwater Basin pasture would be rested one in six years and only be used prior to July 11 one in six years. Maintaining existing water developments would improve distribution and reduce impacts to stream reaches and springs. Constructing an exclosure at Honeymoon Spring would protect the spring source and associated wetlands.

Sweetwater AMP-
Predicted effects would be similar to Alternative B in pasture 1 with fall use. Pasture 5 would benefit from rest, but a 40 day treatment may be too long in this small pasture. Pasture 5, however, receives minimal, if any, use by sage grouse and pygmy rabbits. Use by these species occurs in the other four pastures (higher elevation) in the allotment. In Pastures 2,3 and 4, incorporating rest and shortening the season would benefit the riparian habitat. Upland habitat would be maintained or improved for sage grouse nesting cover.

Red Canyon-
Effects to sage grouse habitat would be the similar as described under Alternative B. These habitats areas would improve more quickly with a year of rest incorporated into the grazing system during one of three years, and provide better residual cover and forage for winter wildlife use.

Sweetwater Basin-
As stated above under uplands, shortening the grazing season and changing the season of use should improve riparian and sagebrush habitats for sage grouse, pygmy rabbits and

winter wildlife use. Fencing the entire riparian reach and moving the trough down stream does not provide water for livestock in the upper part of the allotment. This would create new problem by the added trampling around the trough from livestock in pygmy rabbit and sage grouse habitat on private lands and would not help with dispersing the livestock throughout the allotment.

Steamboat-
Effects to sage grouse habitat would be similar to the effects described in Alternative B. Constructing an additional 2.5 miles of fence for the Funnel Basin riparian pasture in the middle of big game travel corridors would create a problem, even when constructed to wildlife specifications. This habitat is used extensively by sage grouse in summer and implementing a three pasture deferred rotation should improve brood rearing habitat without having to construct more fence in Funnel Basin. Cooks Lake would be fenced to conserve the associated habitat and improve habitat conditions for wildlife.

Without the Teddy Creek WCT exclosure riparian conditions and WCT habitat in Teddy Creek BT31 would likely result in a downward trend. The prescribed grazing management is expected to increase livestock use in the Steamboat Pasture and along Teddy Creek. Proposed management includes hot season use every other year and no rest in the rotation. Without construction of the riparian exclosure, livestock impacts to WCT habitat would most likely be increased and result in a downward trend in habitat conditions (through vegetation use and streambank impacts) which may result in a corresponding decrease in the WCT population. Without construction of the Teddy Creek exclosure fence, conservation goals for WCT in MT would likely not be met.

Remaining Allotments-
Management changes on the remaining allotments under this alternative are either not expected to have any impacts to special status species or special status species do not occur in those allotments.

Resource Concern #2: Recreational Opportunities and Public Access

Same as Alternative A.

Resource Concern #3: Socioeconomics

Greater changes in current operations would likely have greater economic effects on the individual operators. Refer to analysis Common to Alternatives B and C under 4.2.3.

Critical Element: Cultural Resources

Refer to Common to Alternatives B and C in Section 4.2.3, page 12.

Critical Element: Wilderness Characteristics

Same as Alternative A.

4.2.6 Comparative Effects for All Alternatives by Issue

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

	Blacktail Road Trail	Spring Brook	Sweetwater AMP	Red Canyon
A	No progress expected	No progress expected	No progress expected	No progress expected
B	improved streambank stability and increasing riparian vegetation. Sedimentation from county road maintenance would continue. Fisheries habitat expected to improve	Progress expected in Pappy's Gulch and Lower Virginia Pastures. Most progress expected on private and state lands included in NRCS Ranch Plan. Possible drying of Honeymoon Spring and loss of wetlands on BLM.	Good progress expected within 10 years in increasing riparian vegetation and improving streambank stability. Excellent progress expected in increasing deciduous woody riparian vegetation in juniper treatment areas. Improvement of fisheries habitat expected	Good progress expected. Exclosures around spring sources
C	More increase in willow cover expected than under Alternative B. Sedimentation from county road maintenance will continue.	Progress expected in Pappy's Gulch and Wood Canyon Pastures. Slow/ or slight progress in Lower Virginia Pasture.	Progress would be a little slower than in Alt B, because there would be less frequent rest in the system. Improvement of fisheries habitat expected.	Good progress expected throughout allotment. Exclosures around spring sources. Rest incorporated into system.

	Sweetwater Basin	Timber Creek AMP	Spring Brook Isolated	Steamboat
A	No progress expected	No progress expected	No progress expected	No progress expected
B	Good progress expected. Exclosure around spring source.	Good progress expected as a result of grazing system. Increased riparian health in riparian juniper treatment reaches.	Riparian improvements expected due to dormant season use only and short duration grazing periods. Cottonwood regeneration may be impacted by livestock browsing along RU101.	Excellent progress expected at Cooks Lake, Teddy Creek and Granny Springs. Improvements are also expected in the Funnel Basin area.
C	Most progress expected on public land. Exclosure around entire stream reach on public land.	Some progress is expected within 10 years.	Corridor fences would eliminate livestock impacts on two stream reaches on public lands, which would improve quickly. Use would be more concentrated on adjacent private lands along the same stream.	Excellent progress expected at Cooks Lake, Granny Springs and Funnel Basin. Progress not expected along Teddy Creek, where riparian health and fisheries habitat conditions may decline.

Issue #2 – Upland Health, Sagebrush Steppe and Associated Species

Alt	Blacktail Road Trail	Spring Brook	Sweetwater AMP	Red Canyon
A	No change expected, Upland health standard was met.	No change expected. Upland concerns were noted in Sweetwater Basin Pasture.	No change expected, Uplands were generally in excellent condition.	No change expected; Upland health standard was met.
B	Maintenance or improvement of cool season grasses expected.	Improvement expected in vigor, cover and composition of cool season grasses within one grazing cycle in all pastures except Wood Canyon. Cool season grasses may not be maintained in Wood Canyon Pasture.	Improved vigor, cover and composition of cool season grasses expected in livestock preferred areas due to rest rotation (pastures 2, 3, 4) or deferred use (pasture 1) within one grazing cycle.	Same as Alternative A.
C	Same as alternative B	Improvement expected in vigor, cover and composition of cool season grasses in all pastures.	Similar to alternative B, but slower improvement expected in livestock preferred areas in pastures	Improved vigor, cover and composition of cool season grasses expected because of rest in system.

Alt	Sweetwater Basin	Timber Creek AMP	Spring Brook Isolated	Steamboat
A	No change expected. Upland health standard was met.	No change expected. Upland standard was met.	No change expected. Upland standard was met.	No change expected. Upland standard was met, although concerns were noted regarding vigor of cool season grasses in lower areas (Granny Pasture).
B	Upland conditions would be maintained or improved.	Upland conditions would be maintained or improved.	Improvement expected in vigor, cover and composition of cool season grasses with deferred/dormant season use only.	Improved vigor, cover and composition of cool season grasses expected in Granny Pasture because of deferred rotation.
C	Same as Alternative B.	Same as Alternative B.	Same as Alternative B.	Similar to Alternative B. May see improved vigor of cool season bunchgrasses sooner in lower areas.

Resource Concern #2 – Special Status Species

Alt	Blacktail Road Trail	Spring Brook	Sweetwater AMP	Red Canyon
A	No change,	Sage grouse habitat not expected to improve.	Sage grouse brood rearing habitat not expected to improve.	Sage grouse brood rearing habitat not expected to improve.
B	Same as Issue #1 above Idaho sedge habitat?	May increase disturbance to ferruginous hawk and sage grouse during nesting season.	Improved sage grouse brood rearing habitat.	Improved sage grouse brood rearing habitat.
C	Same as Issue #1 above Idaho sedge habitat?	Improved sage grouse brood rearing, and nesting cover	Greater progress to improve brood rearing habitat by implementing riparian juniper treatments throughout allotment	Improved sage grouse brood rearing habitat and nesting cover.

Alt	Sweetwater Basin	Timber Creek AMP	Spring Brook Isolated	Steamboat
A	Sage grouse brood rearing habitat not expected to improve.	No change expected	No change expected	No change expected
B	Improved sage grouse brood rearing habitat	See issue #1 and 2 above	Improved sage grouse and pygmy rabbit habitat, with dormant season use.	Improved sage grouse brood rearing and summer habitat. Expect progress in improving streambank stability and increasing riparian vegetation. WCT habitat is expected to rapidly move toward Desired Future Condition
C	Improved sage grouse brood rearing habitat May impact sage grouse nesting and pygmy rabbit habitat.	See issue #1 and 2 above	Improved sage grouse and pygmy rabbit habitat, with dormant season use. Improved riparian habitat conditions with riparian exclosures.	Similar to Alternative B, greater improvement to sage grouse brood rearing and summer habitat in Funnel Basin pasture. Increased impacts predicted to cause a decline in WCT habitat on Teddy Creek.

Resource and Social Concern #2 – Recreational Opportunities and Public Access

Comparison of Alternatives within applicable allotment by miles of road access changed.

Comparison of effects of Motorized Access changes

Alt	Sweetwater AMP	Steamboat	Rock Creek
A	No changes from Dillon RMP Travel Management Plan.	No changes from Dillon RMP Travel Management Plan.	No changes from Dillon RMP Travel Management Plan.
B	2.7 miles of designated motorized routes closed for resource reasons ½ mile of previously closed route opened to motorized vehicles to enhance public access	Nearly 5 miles of existing, but not previously inventoried route, designated open to motorized vehicles to enhance public motorized access along Clover Divide/Blacktail Ridge	No net change in designated motorized route mileage – approximately 1 mile opened and one mile closed in roughly the same area to reduce resource impacts and continue to provide public access
C	Same as Alternative A	Same as Alternative A	Same as Alternative A

Resource and Social Concern #3 – Socioeconomics

Comparison of effects on Socioeconomics for Livestock Permittes.

Alt	Blacktail Road Trail	Spring Brook	Sweetwater AMP	Red Canyon
A	90 AUMs	1,000 AUMs	2,071 AUMs	367 AUMs
B	Up to 238 AUMs (combined with East Clover Creek Allotment and portion of Stock driveway.) Increased labor inputs to herd trailing livestock off Blacktail Deer Creek. Increased construction and maintenance costs for projects.	Up to 1,000 AUMs. Substantially increased construction and maintenance costs for projects. Increased labor costs for moving livestock more frequently, but only one herd to check/move vs. two (larger herd).	Up to 1,336 AUMs Shorter season of use and reduced number of livestock necessitates finding alternate pasture during spring and fall and/or reducing herd size. Increased construction and maintenance costs for projects.	Up to 367 AUMs Increased construction and maintenance costs for projects.
C	< 238 AUMs. Resting every other fall necessitates finding alternate pasture. Increased construction and maintenance costs for projects. Increased labor inputs to herd trailing livestock off Blacktail Deer Creek.	Up to 734 AUMs. Shorter season of use necessitates finding alternate pasture for 2 weeks in spring and 1 month in the fall. Slightly increased construction and maintenance costs for projects.	Up to 1,265 AUMs Shorter season of use and reduced number of livestock necessitates finding alternate pasture during spring and fall and/or reducing herd size. Increased construction and maintenance costs for projects.	Up to 367 two out of three years. Rest every third year necessitates finding alternate pasture during that year. Increased construction and maintenance costs for projects.

Alt	Sweetwater Basin	Timber Creek AMP	Spring Brook Isolated	Steamboat
A	107 AUMs	741 AUMs	232 AUMs	Anderson 123 AUMs Stock driveway (unleased) 4,483 acres
B	Up to 107 AUMs Alternate season of use necessitates changing operation.	Up to 620 AUMs Reduced number of livestock and shortened season of use necessitates finding alternate pasture (for two weeks in the fall) and slightly reducing herd size. Increased construction and maintenance costs for projects.	Up to 232 AUMs Shorter season of use and no spring use requires finding alternate pasture.	Up to 1,340 AUMs Implementing management will increase labor inputs to move livestock as prescribed. Increased construction and maintenance costs for fences and water developments. Shorter season of use necessitates finding alternate pasture for two weeks each spring.
C	Up to 107 AUMs Increased construction and maintenance costs to move watering trough to private land.	Up to 664. Reduced number of livestock necessitates finding alternate pasture or reducing herd size. Increased construction and maintenance costs for projects.	Up to 232 AUMS Shorter season of use and no spring use requires finding alternate pasture. Increased labor and maintenance costs for corridor fencing stream reaches.	Up to 1,340 AUMs Implementing management will increase labor inputs to move livestock as prescribed. Substantially increased construction, labor and maintenance costs for fences and water developments.

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 the entire Sweetwater Hills, Blacktail Mountain Range and the Snowcrest Mountains and adjacent continuous habitats. The BTW Assessment Report contains historical information that is applicable to this section. Also, some past, present and reasonably foreseeable actions are discussed in Chapter 3 (Affected Environment) and/or Chapter 2 (Features Common to all Alternatives).

Herbivory, trampling and road construction/maintenance directly effect Idaho sedge plants. Invasive plants compete with Idaho sedge and hydrologic alterations affect its wetland habitat. When these impacts are combined with drought conditions, individual plants or habitat of Idaho sedge in the BTW may be impacted; but will not likely contribute to a trend towards loss of viability to the population or species.

These effects or actions are common to all alternatives:

Historical Events

- 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 Kaufman, 1999). Although there are still active beaver colonies in the BTW, beaver activity is substantially reduced from historical levels.
- Watershed-wide under all management schemes on all land ownerships, there has been 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 and long-term overuse by ungulates (Bartos and Campbell, 1998).
- Early ranching in the region began in 1864 when Poindexter and Orr Ranch (later the Matador) started ranching an estimated 36,000 acres of land in the Blacktail Deer Creek drainage. Livestock were trailed on a seasonal basis following old Indian trails along Blacktail Deer Creek from Dillon and the Ruby River from Virginia City and Alder into the Centennial Valley.
- From the 1870s through mid 1900s, thousands of livestock (cattle, sheep and horses) were wintered near Dillon and in Blacktail Valley and trailed on a seasonal basis from Dillon to Centennial Valley along Blacktail Deer Creek.

Past Management and Current Use Trends

- Elk and moose populations in southwest Montana have increased over the past 20-25 years, primarily as a result of light snow conditions during fall and winter, few moose hunting permits, and low hunter harvest. There has been a shift in elk winter use on the Blacktail game range, many of these elk are now wintering in the Spring Brook area.
- Threats to WCT include competition, hybridization, and restricted habitat which has been exacerbated by the recent drought cycle. Other factors listed in this

section that impact riparian health would also impact WCT habitat in applicable streams.

- A continuation of current water and land use practices on some private and state lands would continue to affect fish habitat within the planning area. Livestock and wildlife impacts on lands upstream from BLM administered land may contribute sediment to streams and subsequently may adversely affect downstream water quality and fish habitat 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.).
- The economic situation of the permittees is effected 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 to permittees could add pressure to permittees to subdivide private land to maintain a cash flow.

Anticipated Future Actions

- Sagebrush control treatments are reasonably foreseeable actions on private lands or perhaps State lands within the watershed. Potential vegetation treatments on private or State lands within allotments may lessen the benefit of public land grazing management strategies intended to improve sagebrush or herbaceous community composition and structure for seasonal wildlife uses. Fencing on other land ownerships and on BLM boundaries may lessen the benefit of fence modification efforts on public lands to improve wildlife movements.
- Recreation, especially hunting, is expected to increase in the BTW 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.
- Sub-dividing of private land within the watershed is currently occurring on a very small scale. Although not expected to be extensive, subdivision may expand in the foreseeable future. Sub-dividing and development causes habitat fragmentation, increases traffic and other human uses in the area, and may increase the demand for water.

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

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

Under Alternative A, the riparian health concerns identified in the BTW Assessment would not be addressed and the objectives would not be met. Fisheries habitat conditions and trends would continue on the public land portions of these streams. Riparian areas currently in a downward trend would continue in a downward trend without changes in management. On streams that received a FAR downward or static rating, this could lead to a decline in fish habitat conditions. Areas where channel alteration has caused changes in channel morphology resulting in reduced channel maintenance and sediment transport functionality would continue this trend under the Alternative A. Conversely, streams such as Cottonwood, Jake Canyon, Alkali and others that where rated as PFC, fish habitat requirements would continue to be met as long as current trends continue. Sage grouse brood rearing habitat requirements may be adversely impacted due to the condition and trend of many streams in the watershed.

4.3.2 Cumulative Effects of All Action Alternatives

Slightly increased labor costs are assumed under Alternatives B and C to check and employ the allowable use 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 Permits.

Many of the fences identified to present barriers to wildlife movement are boundary fences between BLM and adjacent landowners. Modifying, replacing, or removing barrier fences would mitigate the presence of barriers and collision/entanglement hazards on public lands and will be done in coordination with adjacent landowners as they are identified. The action alternatives are proposing to add up to a maximum of 8 miles additional miles of new fence (built in accordance with BLM wildlife specifications.)

There are approximately 30 water developments within the watershed including wells, pipelines, troughs, water gaps and reservoirs. The action alternatives proposed to add up to a maximum eight new spring developments with exclosures, 12 watering troughs, eight miles of pipeline, one storage pond and two riparian/wetland exclosures. This may vary depending on which alternative is selected. For water developments the number may vary depending on engineering feasibility results and flow measurements.

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. Managing to improve riparian conditions throughout the watershed would allow for better dispersal of wild ungulates and reduce site specific riparian impacts.

The proposed changes in livestock management would generally improve riparian function on BLM administered land and other lands within BLM allotments at varying degrees and timeframes. The expected effect to downstream riparian habitats and water quality would be decreased sediment load, lower energy flows and lower water temperatures.
Managing for larger, more 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 alter of use in specific areas within the watershed. Additional off-site water locations would better disperse livestock use in specific areas within the watershed and reduce use in riparian areas.

With less forage (AUMs) available from BLM lands, cattle would have to be pastured elsewhere for part of the grazing season or the herd size may have to be reduced. Increasing livestock use could have a direct effect to these habitats on private property adjacent to or near public lands offsetting the benefits to public land when viewing the watershed as a whole. If private livestock numbers are reduced permanently, a corresponding decrease in tax revenues could be expected for Beaverhead County.

4.3.3 Cumulative Effects of Alternatives B

Impacts or predicted effect in addition to those described above under Alternative B (4.2) are not expected except for the Spring Brook Allotment described below.

Spring Brook Allotment
Alternative B proposes implementation of a Ranch Management Plan developed by the NRCS in coordination with the rancher/livestock permittee, Montana DNRC and the BLM. This Ranch Plan proposes revised management on 15 pastures. Five of these pastures include BLM administered lands in the Spring Brook Allotment (Honeymoon, Upper Virginia, Lower Virginia, Sweetwater Basin and Wood Canyon), which is 40% public land. Two pastures contain smaller parcels of BLM administered lands in the Spring Brook Isolated Allotment (Spring Brook and Middle Spring Brook). Eight pastures contain only private and state lands. Private and state lands are also intermingled in all of the pastures containing BLM administered lands. BLM administered lands would provide 24% of the 5,276 AUMs included in the Ranch Plan. The remaining 3,996 AUMs included in this plan are on private and state administered lands. Although Alternative B may not result in the most improvements to resource conditions on BLM administered lands as compared to Alternative C, it would facilitate improvement to both upland and riparian health on all lands included in the ranch plan, regardless of ownership. This, larger, more holistic approach is expected to improve habitats for wildlife and improvement to water quality (via riparian and upland health) on a substantially larger area. Resource conditions on the lower elevation private and state lands included in this plan may benefit more than the public lands administered by the BLM, because the BLM lands are generally in better condition at this time.

The NRCS is not bound by the spring development guidelines described in this EA. BLM Project 671, known as Honeymoon Spring, is located upslope of the NRCS proposed spring development on private land and the pipeline associated with the development. The NRCS proposed project on private land could potentially dry out the upslope project and the associated wetlands. This development could also reduce the wetland or dry out the spring located on private land. Designing a closed system would mitigate this potential.

Overall within this BTW, Alternative B would be the most beneficial to fisheries and specifically WCT habitat. Much of the sport fish and occupied WCT habitat within the

area occurs on BLM managed lands located upstream of state and private property. Any improvement to riparian resource conditions on public land administered by the BLM within this watershed would have a positive impact on occupied fish habitat resulting in healthier populations. Allowable use stubble height guidelines, combined with projects such as the Moose Creek juniper treatments, Blacktail drift fence and the Teddy Creek WCT exclosure would be expected to improve the habitat conditions on those reaches. Overall the condition of fishery habitat found to be not meeting requirements would make relatively fast progress towards meeting objectives or in the case of those in PFC condition, habitat would continue to improve towards a DFC (desired future condition) as described in the Dillon RMP.

4.3.4 Cumulative Effects of Alternatives C

Cumulative effects to fisheries under Alternative C would be similar to those under Alternative B, with the exception of the Steamboat Allotment. By not constructing the Teddy Creek exclosure the BLM would be putting a WCT population at risk by authorizing uses that would likely cause a decline in WCT habitat conditions on 1 ¼ miles of headwater.

Impacts in addition to those described above under Alternatives C (4.2) are not expected**.**

5.0 List of Preparers - Consultation/Coordination

5.1 List of Preparers

5.1.1 Core IDT members:

Kelly Bockting	Wildlife Biologist - IDT leader
Bart Howells	Rangeland Management Specialist
Kipper Blotkamp	Fuels Specialist
Paul Hutchinson	Fisheries Biologist
Steve Armiger	Hydrologist/Air and Water Quality, Riparian,
Pat Fosse	Assistant Field Manager – Renewable Resources
Aly Piwowar	Forester

5.1.2 Support IDT members include:

Jason Strahl	Archeologist
James Roscoe	Wildlife Biologist
Michael Mooney	Weeds Specialist
Brian Hockett	Rangeland Management Specialist/TES-plants
Rick Waldrup	Outdoor Recreation Planner/Wilderness Specialist
Bob Gunderson	Geologist

5.2 Consultation/Coordination

5.2.1 Persons and Agencies Consulted

Dick Oswald	Fisheries Biologist, MTFWP
Bob Brannon	Game Biologist, MTFWP
Gary Berger	Soils Scientist, USDA, NRCS
Marnie Thompson	Range Specialist, USDA NRCS Sheridan Office
Shanna Huckins	Range Specialist, USDA NRCS Dillon Office
Chuck Maddox	Rangeland Specialist, DNRC
John Murray	THPO, Blackfeet Tribe
Arlene Caye	Confederated Salish and Kootenai Tribes
Francis Auld	Confederated Salish and Kootenai Tribes
Carolyn Boyer Smith	Cultural Resource Coordinator, Shoshone-Bannock Tribes
Ron and Marilyn Benson	
Ray Marxer	
Jim and John Anderson	
Keith and Scott Anderson	
Dan and Janet Doornbos	
Judy Brown and Bob Miller	
Don Rebich	

5.2.2 Notifications

Internet NEPA Log – Dillon Field Office – February, 2007
Mailing List for BTW Assessment
Media Release in Southwest Montana – May 2006

5.2.3 Statement of Public Interest

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

GLOSSARY OF TERMS

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

adapative 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.

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.

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

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

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

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

cool season species: plants whose major growth occurs during the late fall, winter and early spring.
evaluation: (1) an examination and judgment concerning the worth, quality, significance, amount, degree, or condition of something; or (2) the systematic process for determining the effectiveness of on-the-ground management actions and assessing progress toward meeting objectives.

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

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

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

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

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

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.

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

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

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

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

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

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

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

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

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

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, ant the outputs or achievements that are measurable and quantifiable, are specified. (See goal)

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

proper functioning condition (PFC): Lotic riparian-wetland areas are 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:

riparian zone: the banks and adjacent areas of water bodies, water coursed, 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.

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

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

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

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

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

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

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

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

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