



Centennial Watershed Environmental Assessment
DOI-BLM-MT-B050-2015-0011-EA
Dillon Field Office
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Centennial Mountains, June 2014

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Chapter 1

1.0 Purpose of and Need for the Proposed Action

1.1 Introduction and Background

The Centennial Watershed (CW) is located in southeastern Beaverhead County, Montana on the eastern slopes of the Rocky Mountains (See Appendix A, Map 1). The watershed lies in Townships 13-15 South, Ranges 1-7 West and Range 1 East Montana Principal Meridian (M.P.M). The assessment area covers public lands administered by the BLM from approximately Lima Dam on the west to Red Rock Pass on the east and from the continental divide along the Montana-Idaho border on the south to the Gravelly Range on the north. This area includes public lands within two hydrologic unit code (HUC) 5 boundaries covering the Centennial Valley. The assessment area boundary follows grazing allotment boundaries and includes some allotments that are partially within the watershed.

Within the Centennial Watershed Assessment boundary, there are approximately 347,543 acres of which the BLM administers 83,102 acres. This report addresses only public lands administered by the BLM within the watershed. However, there are several other ownerships that occur within the watershed (approximately 59,832 acres administered by the State of Montana Department of Natural Resources (DNRC), 105,718 acres of privately owned lands, 39,231 acres of public land administered by the Red Rock Lakes National Wildlife Refuge, 15,538 acres administered by the USDA Agricultural Research Service (Sheep Experiment Station) and 44,122 acres administered by the US Forest Service (USFS) also occur within the watershed assessment area.

Approximately 24% of the watershed, 83,102 acres, is public land administered by the BLM. The CW encompasses 36 grazing allotments containing 74,610 acres of BLM land and 8,492 acres that is un-allotted to livestock grazing. The un-allotted acres are located within the Centennial Mountains Wilderness Study Area (WSA), which includes a total of 27,691 acres.

In some locations, the watershed boundary follows BLM grazing allotment boundaries and includes some allotments that are only partially within the watershed. Watersheds are defined and designated on maps, by natural topographical boundaries (ridgelines/drainages). Grazing allotments boundaries have been determined by previous BLM decisions and land ownership. These administrative boundaries may not follow topographical features. Therefore, some of the grazing allotments in the assessment area fall within one or more hydrologic unit or watershed.

In 2014, an interdisciplinary team (IDT) assessed BLM administered land in the CW for the five Standards of Rangeland Health. The Standards are: Upland Health, Riparian Health, Water Quality, Air Quality, and providing for Biodiversity. The CW Assessment Report, issued in January of 2015, described the condition/function of resources within the assessment area to the Authorized Officer. The IDT also incorporated the data from the Middle Rockies Rapid Eco-Regional Assessment (REA) and used this data to help determine and prioritize resource issues within the CW. The Centennial Watershed Assessment Report (page 3 – 5) provides a brief

description of the purpose of the Middle Rockies RES. The CW Assessment Report has been made available to the public and may be reviewed at the Dillon Field Office, or on the internet at http://www.blm.gov/mt/st/en/fo/dillon_field_office.html.

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

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

1.2 Proposed Action, Purpose and Need

The BLM Dillon Field Office proposes to improve land health, including water quality, and enhance biodiversity within the Centennial Watershed by:

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

The BLM also proposes to renew term grazing permits/leases and initiate treatments to salvage harvest dead and dying timber.

This EA is in direct response to land health condition/function and recommendations identified in the CW Assessment Report. In that document, the IDT described several causal factors, which, when combined, negatively impact the biological, physical, and ecological processes within specific areas or allotments within the watershed.

The Fundamentals of Rangeland Health and Land Health Standards require the BLM to initiate management actions that ensure, "Watersheds are in, or are making significant progress toward, properly functioning condition, including their upland, riparian-wetland, and aquatic components..." if an assessment determines one or more of the Land Health Standards are not being met (43 CFR 4180.1(a)).

Table 1.1 shows the Authorized Officer's determination of each standard in each grazing allotment in the CW.

Table 1.1 Determination of Standards by Allotment.					
Allotment Name, Number, & BLM Acres	Are Healthy Rangelands Standards Being Met?				
	Upland	Riparian Wetland	Water Quality	Air Quality	Bio-diversity
7L SGC 20153 Acres: 343	YES	YES	NO ²	YES	YES
Antelope Peak 20179 Acres:2338	YES	NO	N/A	YES	YES
Bean Place 10125 Acres: 129	YES	YES	N/A	YES	YES
Brundage Bridge 20707 Acres: 382	YES	YES	NO ²	YES	YES
Brundage Creek 20707 Acres: 4118	YES	YES	1	YES	YES
Cayuse 03234 Acres: 475	YES	N/A	N/A	YES	YES
Centennial 20710 Acres: 527	YES	N/A	N/A	YES	YES
Centennial Isolated 20641 Acres: 40	YES	N/A	N/A	YES	YES
Cocanougher Ind. 10738 Acres: 45	YES	YES	NO ²	YES	YES
Curlew 20199 Acres: 181	YES	YES	N/A	YES	YES
Davis SGC Common 10737 Acres: 446	YES	YES	NO ²	YES	YES
Duff Creek AMP 20688 Acres: 3344	YES	YES	NO ²	YES	YES
Fish Creek 20172 Acres: 3706	YES	NO	NO ²	YES	YES

Table 1.1 Determination of Standards by Allotment.					
Allotment Name, Number, & BLM Acres	Are Healthy Rangelands Standards Being Met?				
	Upland	Riparian Wetland	Water Quality	Air Quality	Bio-diversity
Jones SGC 20731 Acres: 122	YES	YES	N/A	YES	YES
Lima Reservoir AMP 10151 Acres: 5122	YES	YES	N/A	YES	YES
Long Creek AMP 20154 Acres: 4476	YES	NO	NO ²	YES	YES
Long Creek SGC 20157 Acres: 117	YES	N/A	1	YES	YES
Lousy Springs 00763 Acres: 621	YES	N/A	N/A	YES	YES
Mata-stib SGC 10696 Acres: 472	YES	YES	N/A	YES	YES
McCandless Brothers SGC 20185 Acres: 300	YES	YES	N/A	YES	YES
Monida-Corral Creek 00766 Acres: 72	YES	N/A	N/A	YES	YES
Monida Hill 20023 Acres: 6462	YES	YES	1	YES	YES
Morton Ind/SGC 20163 Acres: 470	NO	NO	NO ²	YES	NO
Mud Lake 30260 Acres: 1083	YES	YES	1	YES	YES
Oxbow 20735 Acres: 3254	YES	YES	NO ²	YES	YES
Passmore/SGC 20183 Acres: 83	YES	YES	NO ²	YES	YES

Table 1.1 Determination of Standards by Allotment.					
Allotment Name, Number, & BLM Acres	Are Healthy Rangelands Standards Being Met?				
	Upland	Riparian Wetland	Water Quality	Air Quality	Bio-diversity
Peet Creek 10730 Acres: 4750	YES	YES	NO ²	YES	YES
Price Creek 30040 Acres: 14562	YES	YES	NO ²	YES	YES
Red Rock 30636 Acres: 267	NO	NO	NO ²	YES	NO
Ritchie SGC 30610 Acres: 160	YES	YES	N/A	YES	YES
Rody Ind. 20685 Acres: 414	NO	N/A	N/A	YES	YES
Saier Ind. 20169 Acres: 321	YES	N/A	N/A	YES	YES
Sand Dunes 20732 Acres: 665	YES	N/A	N/A	YES	YES
Shambo Units 20152 Acres: 11660	YES	YES	NO ²	YES	YES
Shineberger 20159 Acres: 277	YES	YES	N/A	YES	YES
Tom Creek 20701 Acres: 2806	YES	YES	NO ²	YES	YES

¹ These allotments contain tributary streams which are not on the 303(d) list, are not priority streams, are not scheduled to be evaluated by the DEQ and have no beneficial use determinations. Therefore, the water quality standard cannot be determined.

² The Montana Department of Environmental Quality (DEQ) has been given the responsibility for making water quality determinations and has completed its evaluation of 303(d)-listed streams. Allotments with listed streams failed the water quality standard, but BLM authorized activities are not necessarily a causal factor.

The Authorized Officer determined that livestock grazing impacts are contributing to one or more of the Standards not being met in six grazing allotments. Pursuant to 43 CFR 4180.2(c), livestock-caused failure to meet any of the Standards mandates the BLM to change the terms and conditions of the grazing permit/lease for the applicable grazing allotment prior to the next grazing season and implement actions that will result in significant progress toward fulfillment of the Standards. Further, BLM guidance stipulates that if actions are necessary and cannot be implemented before the next grazing season interim adjustments will be made prior to the next grazing season and a schedule for final changes must be developed and documented (H-4180-1).

Livestock management proposals on the six allotments that failed to meet at least one of the standards; Antelope Peak, Fish Creek, Long Creek AMP, Morton Individual SGC, Red Rock and Rody Individual will be analyzed. Alternatives will also be analyzed for six allotments (Peet Creek, Shambo Units, Coconougher, Brundage Creek, McCandless Brothers and Lousy Springs) that met all of the Land Health Standards, but either had site-specific resource concerns or the permittee has proposed management changes to facilitate more efficient or effective use.

1.3 Issues and Resource Concerns

Description of Issues, Resource Concerns and Objectives

Issues and resource concerns were identified during the CW Assessment and the public scoping process. Issues, as described below, have a direct bearing upon the proposed action and the process of how the purpose and need will be achieved. The development of management alternatives are in direct response to the identified issues. Resource concerns do not necessarily drive the development of alternatives, but may be affected by proposed actions in the alternatives.

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

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

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

Issue #1: Riparian, Wetland and Aquatic Habitat

One of the Western Montana Standards for Rangeland Health is “Riparian and Wetland Areas are in Proper Functioning Condition (PFC).” PFC is defined as the ability of a stream or wetland to perform its riparian functions. These functions include sediment filtering, bank building, water storage, aquifer recharge and hydrologic energy dissipation. PFC is a prerequisite to achieving desired condition (USDI 1998). The Dillon Resource Management Plan and Record of Decision of 2006 predict the achievement of desired future condition in 20 to 50 years. Use of the PFC methodology is recognized as an early indicator of water quality trends (Aron et al. 2013). PFC streams are not necessarily meeting water quality standards. Streams or wetlands that are categorized as Functional-At-Risk (FAR) with an upward trend also meet the riparian health standard. The methods and procedures used to determine riparian health in the Centennial Watershed are discussed in the CW Assessment Report.

The riparian health standard was not met in five grazing allotments including Red Rock, Morton Individual SGC, Fish Creek, Long Creek AMP and Antelope Peak. Two other allotments, while meeting the riparian standard overall, had some site specific concerns (Peet Creek and Shambo Unit Allotments). The CW Assessment Report documents several reasons the riparian health standard was not met including; alteration of stream morphology (channel shape and gradient) with resultant over-widening, reduced access to floodplains, and/or channel entrenchment. Impacts to vegetation included limited species recruitment and regeneration, reduced structural diversity and/or decreased vigor of streamside vegetation. Increasing conifer cover on some stream reaches is crowding out the deciduous riparian woody species and limiting the establishment of bank stabilizing herbaceous (grasses and sedges) communities. These conditions were attributable to several factors including impacts to vegetation and stream banks and channels from livestock activity, conifer expansion, historic mining, wildlife browsing and sedimentation and/or confinement from roads.

Objectives:

- Improve streambank stability and width/depth ratio of streams within the natural range of variability based on Rosgen Stream Types.
- Mitigate excessive head cutting and restore vertical channel stability.
- Restore deciduous woody and herbaceous riparian habitat types, with emphasis on reducing conifer and non-native species composition.
- Increase deep-rooted riparian vegetation (sedges, willows) where decreased composition was documented.
- Reduce sediment inputs into streams where human activities such as authorized grazing, recreational impacts and roads are contributing to unacceptably high sediment loads.
- Maintain/enhance habitat for cold water fisheries in occupied streams.
- Restore, maintain and/or enhance native vegetation and hydrology of springs, seeps and wet meadows with emphasis on ecological function and biodiversity.
- Protect the water source of developed springs from impacts (hoof action) by livestock.

Figure 1.1 Hell Roaring Creek, June 2014



Issue #2: Upland and Sagebrush Steppe Habitat

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

The upland health standard was met in 33 of the 36 grazing allotments in the watershed. The IDT did, however, identify some localized concerns within allotments that overall, met the upland health standard. Upland resource issues and concerns will be addressed through a range of grazing management alternatives described in chapter 2. Resource concerns include a shift in the dominant herbaceous vegetation communities from cool season bunchgrasses to less productive warm season grasses, annual invasive species and/or unpalatable vegetation, increased bare ground, wind and water erosion, invasive species, and noxious weed infestations.

Sagebrush habitat in the CW is in good condition and is not a resource issue. However, the BLM recognizes the value of healthy sagebrush habitats, and will continue to rigorously monitor conditions within the CW with the intent of maintaining or improving sagebrush habitat.

Objectives:

- Restore the soil/site stability, hydrological function, and biotic integrity of upland sites in allotments where one or more of these attributes of rangeland health was determined to be reduced.
- Increase cover and frequency of native perennial cool season herbaceous species where concerns were documented, which will improve the hydrological function and site productivity.
- Restore/maintain open sagebrush communities in habitats incurring conifer expansion.

Figure 1.2 Badger in the Monida Hill Allotment, July**Issue #3: Forest and Woodland Habitat**

Forests and woodlands provide habitat for a large variety of fish and wildlife species, opportunities for diverse recreational activities, and a renewable source of forest projects. Due primarily to the exclusion of fire, low to mid-elevation forests and woodlands within the CW have been altered from the historic range of variation. Conifer densities have increased within forested stands, particularly within Douglas-fir forest types. Conifers have expanded into sagebrush/grassland resulting in conversion to conifer forest, and a decrease in extent of mountains meadows and sagebrush/grassland steppe. Also due in part to fire exclusion, conifers have established within aspen stands, outcompeted existing aspen trees for available resources, which has resulted in the conversion of vast acreages of former aspen communities to conifer-dominated forest. The majority of forested stands, in all habitat types, are in late-seral stages and are experiencing mortality from insects and disease, or are highly susceptible to insect outbreaks.

Epidemic mountain pine beetle infestations have resulted in extensive mortality of lodgepole pine. Whitebark pine is rapidly declining throughout its range, and all whitebark pine habitats in the CW are at high risk of loss due to extensive region-wide mortality and lack of disturbance to stimulate regeneration.

Objectives:

- Maintain/enhance existing aspen and promote successful regeneration of aspen.
- Increase diversity of seral stages and structures in forested habitats.
- Reduce hazard rating for spruce budworm and Douglas-fir bark beetle activity
- Mitigate mortality of whitebark and limber pine from insects and disease in priority areas and priority individual trees (PLUS trees), and promote successful regeneration of whitebark and limber pine.
- Utilize forest products where feasible.
- Return fire to the landscape as a natural disturbance agent for the purpose of resiliency and diversity of seral classes (age, structure), through the use of prescribed fire.

Figure 1.3 Forested Areas in the Shambo Units Allotments, July 2014



Issue #4: Special Status Species Habitat

Special Status Species (SSS) include federally listed Threatened, Endangered, Proposed and Candidate Species, and BLM Sensitive Species. See the Biological Evaluations (BE) on Threatened and Endangered (T&E) species, Special Status plants, wildlife, and fish in Appendices C and D for additional information. Special Status Species are discussed in the CW Assessment Report, as well as chapters 3 and 4 of this EA. Objectives for Riparian Health, Upland Health and Forest and Woodland Health also include objectives related to fish, wildlife and special status species habitat.

Between the times the Centennial Assessment Report was sent out and this EA was written we received notification that the special status species list was updated. This EA will analyze the sensitive species on the updated list only. The guidance the DFO received is as follows: In accordance with the BLM Special Status Species Policy (Manual-6840), the Special Status Species List has been updated to assist in addressing conservation management needs and to help establish priorities. The 6840 manual gives the State Director the responsibilities of designating the Bureau of Land Management (BLM) sensitive species and periodically reviewing/updating the list in cooperation with states and with the Natural Heritage Programs. The sensitive species designation is used for species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the Endangered Species Act (ESA).

Candidate species in the CW are sage grouse, and whitebark pine. Threatened species that occur in the watershed are grizzly bear. The SSS issues identified for this EA are sage grouse, westslope cutthroat trout and arctic grayling.

Objectives:

- Enhance/improve/protect “Priority Habitats” including aspen, whitebark pine and limber pine.
- Improve streambank stability, vegetative cover and width/depth ratio on westslope cutthroat trout (WCT) streams.
- Continue to work with MT Fish, Wildlife and Parks and other partners in the management of native fish (WCT and arctic grayling).
- Maintain >70% mountain big sagebrush habitat in canopy closure of 5 to 25 percent.
- Maintain an adequate herbaceous understory in sagebrush steppe habitat emphasizing multiple species of native forbs and grasses.
- Maintain or enhance habitat for sensitive plant species and provide ample opportunity for reproduction and seedling establishment. Increase/Improve early seral habitat in the Centennial Sandhills.
- Mitigate mortality of whitebark and limber pine from insects and disease in priority areas and priority individual trees (PLUS trees) and promote successful regeneration of whitebark and limber pine.

Resource Concern #1: Noxious and Invasive Species

Spotted knapweed, houndstongue, Canada thistle, black henbane, common mullein, cheatgrass and whitetop occur as relatively small patches or scattered individual plants in various locations within the Centennial Watershed. These noxious and invasive species can affect upland health, riparian health and biodiversity. Noxious and invasive species are discussed in the CW Assessment Report, as well as chapters 3 and 4 of this EA.

Objectives:

- Reduce the composition of noxious and invasive vegetative species within the watershed.
- Mitigate the spread of noxious and invasive plants into, within, or from the watershed.

Resource Concern #2: Socioeconomics

Ranches that hold BLM grazing leases in the watershed have developed operations dependent on a combination of public and private land grazing. Livestock and hay production are important components to the economic well-being and social fabric of local communities and families throughout Beaverhead County.

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

The revenue created by non-commercial hunting and fishing activities on BLM administered lands in the CW contribute substantially to the economic health of communities in Southwest Montana. In addition, the BLM currently authorizes three commercial Special Recreation Permit (SRP) operators to use public lands within the watershed to provide a variety of public recreation opportunities.

Objectives:

- Continue to contribute to the local economy by providing an opportunity for sustainable uses on public land through livestock grazing, utilization of forest products, and recreational activities.
- Recover economic value of dead/dying timber before it is lost due to decay, where feasible.

Resource Concern #3: Wildland Urban Interface

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

Objectives:

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

Resource Concern #4: Cultural & Paleontological Resources

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

Objectives:

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

Resource Concern #5: Recreation and Travel Management

The goals for both Travel Management and OHV Use and Transportation in the Approved Dillon Resource Management Plan for Recreation collectively say; “to manage roads and trails and manage motorized travel to provide for public access or administrative needs, while maintaining or protecting resource values in conjunction with other federal agencies, state and local governments, and private landowners.”

The Dillon RMPs first recreation goal is to provide a diverse array of quality, resource based recreation opportunities’ while protecting the resource values. Recreation use within the CW occurs year round and includes; hunting (big game, birds, and predators), trapping, fishing, hiking, wildlife viewing, camping, recreational driving and rock hounding.

Objectives:

- Effectively implement the Dillon RMP Travel Management Plan.
- Revise motorized route designations as necessary to correct mapping errors and improve route designations.
- Reduce unauthorized (non-designated route travel) motor vehicle use on closed routes.
- Maintain motorized wheeled vehicle access to those areas where it already exists, and improve access to public land where appropriate and where opportunities are currently limited.
- Reduce resource impacts caused by recreationists, including spread of noxious and invasive weed species.

Resource Concern #6: Visual Resource Management

The Visual Resources goal of the Approved Dillon Resource Management Plan is to manage scenic values in accordance with the objectives established in the four VRM classes (see page 65 of the Record of Decision and Approved Dillon Resource Management Plan).

The Centennial Mountains WSA is managed according to VRM Class I objectives. “Preservation of the landscape is the primary management goal in Class I areas. This class

provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.” Some small parcels adjacent to the WSA are identified as VRM Class II. Class II objectives are to retain the existing character of the landscape. Activities or modifications of the environment should not be evident or attract the attention of the casual observer, and changes should repeat the basic elements of the predominant natural features of the landscape.

The rest of the planning area is managed as VRM Class III. “The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes caused by management activities may be evident but should not detract from the existing landscape.”

Objectives:

- Limit management activities or projects within the Centennial Mountain WSA to preserve the existing character of the landscape in accordance with VRM Class I objectives.
- Limit management activities in Class II VRM areas to those that retain the existing character of the landscape where changes do not attract the attention of the casual observer.
- Manage the rest of the CW so as not to detract from the existing landscape and other objectives stipulated under VRM Class III guidelines.

Resource Concern #7: Wilderness Characteristics

There is no designated wilderness area within the CW. The CW does include 27,691 acres of public land located within the Centennial Mountains Wilderness Study Area (WSA) (See Appendix A, Map #1. These lands are managed in accordance with the BLM Manual 6330 – Management of Wilderness Study Areas, published in July, 2012. WSAs are to be managed as to not impair their suitability for preservation as wilderness until such time as Congress either designates them as wilderness or releases them from further study. If either WSA is released by Congress they will be managed as Special Recreation Management Area (SRMA) as described on page 53 of the Dillon RMP.

BLM Instruction Memorandum No. 2011-154 emphasizes that, “Section 201 of FLPMA requires the BLM to maintain on a continuing basis, an inventory of all public lands and their resources and other values, which includes wilderness characteristics”. In accordance with this direction, an inventory was conducted of all lands within the CW that met the minimum criteria for wilderness characteristics set forth in that policy. In order for an area to qualify as lands with wilderness characteristics, it must possess sufficient size, naturalness, and outstanding opportunities for either solitude or primitive and unconfined recreation. Although no specific management is required of lands identified as having wilderness characteristics, any impacts to those characteristics must be identified and disclosed within any environmental analysis that proposes to affect those characteristics.

Objectives:

- Maintain wilderness characteristics of the Centennial Mountains Wilderness Study Areas.
- Manage the Centennial Mountains WSA to the non-impairment standard as outlined in BLM Manual 6330 - Management of Wilderness Study Areas, until congress either releases it or designates it as wilderness.
- Maintain, on a continuing basis, an inventory of wilderness characteristics as describe in BLM Instruction Memorandum No. 2011-154.

Figure 1.4 Cow Elk in the Tom Creek Allotment, June 2014



Resource Concern #8: Air Quality

Section 107 of the Clean Air Act gives primary responsibility to each state for assuring air quality by requiring the development and implementation of plans to address national primary and secondary ambient air quality standards. States must designate nonattainment areas, areas considered to have air quality worse than the National Ambient Air Quality Standards. Airsheds and Impact Zones in Montana and Idaho closest to the Centennial Watershed are Salmon, Idaho and Butte, Montana to the West and North and Big Sky, Montana and Idaho Falls to the East and South. Red Rock Lakes Wilderness Area and Yellowstone National Park are Class I Federal Areas within and downwind of the Centennial Watershed. Class I Federal Areas require the highest level of protection under the Clean Air Act. The 1998 Interim Air Quality Policy for Wildland and Prescribed Fires required states to develop smoke management plans. Montana and Idaho formed the Montana/Idaho Airshed Group and the Montana/Idaho Smoke Management Program.

Objective:

- Minimize impacts to Air Quality by coordinating with the Montana/Idaho Airshed Group and utilizing Burn Plans.

1.3.1 Key Issues and/or Resource Concerns considered, but eliminated**Water, Water Quality and Total Maximum Daily Loads (TMDL)**

Water, specifically water appropriation, and water rights were considered but eliminated from further analysis.

Water in Montana is the property of the State of Montana. The Montana Constitution has the following to say about water, “All surface, underground, flood, and atmospheric waters within the boundaries of the state are the property of the state...” (Montana Code Annotated 2014, Article IX, Section 3, (3)). State Rights to appropriate water are recognized by the Federal Government in the Federal Water Pollution Control Act of 1972 (33 U.S.C. 1251 et seq.) more commonly known as the Clean Water Act (Title 1, Section 101 (g)) The Bureau of Land Management respects the State of Montana’s authority to appropriate water. Except in minor instances, which are discussed where necessary in Chapter 2, water and water appropriation has been considered, but eliminated from further analyses.

Water Quality and Total Maximum Daily Loads were considered but eliminated from further analysis.

The Clean Water Act set a new national goal “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters”, with interim goals that all waters be fishable and swimmable where possible. The Act embodied a new federal-state partnership, where federal guidelines, objectives and limits were to be set under the authority of the U.S. Environmental Protection Agency, while states, territories and authorized tribes would largely administer and enforce the CWA programs, with significant federal technical and financial assistance (USEPA 2012). The federal government recognized that Montana’s waters belong to the State (Montana Code Annotated 2011). The 1987 Amendments to the Clean Water Act (CWA) require States to develop plans for controlling non-point sources of water pollution and to develop Total Maximum Daily Loads (TMDLs) (EPA 1972). To comply with the CWA, Montana has divided the State into water quality planning areas. Guidance includes Montana’ Nonpoint Source Management Plan (DEQ, 2012), which is updated every five years. The plan was most recently updated in 2012. The Dillon Field Office follows the guidance set out in this document.

In an effort to meet its obligations under the Clean Water Act, the Montana Dakotas BLM entered into a memorandum of understanding with the State of Montana titled, *Memorandum of Understanding Regarding Water Quality Management on Bureau of Land Management (Administered) Lands in Montana Between the Montana Department of Water Quality and the United States Department of the Interior Bureau of Land Management* (USDI, 2010). This MOU documents the BLM’s strategy for managing and controlling non-point source (NPS) water pollution from the BLM managed lands and authorizations. The goal of this MOU is discussed in detail in a paper titled, *Using watershed function as the leading indicator for water*

quality (Aron et al 2013). There is growing support for this approach (Hall et.al. 2014, Koslowski et. al. 2013) In short, there is growing concern that the goal of the Clean Water Act to ‘restore and maintain the chemical, physical and biological integrity of the nation’s waters’ is not being fully achieved (USEPA, 2012), that traditional TMDL approaches are ineffective and inappropriate in many settings and that methodologies that assess watershed function such as Proper Functioning Condition (PFC) are appropriate for land management agencies seeking to identify causes and solutions (Hall et al. 2014, Koslowski et al. 2013).

One of the Western Montana Standards for Rangeland Health is “Riparian and Wetland Areas are in Proper Functioning Condition (PFC).” PFC is defined as the ability of a stream or wetland to perform its riparian functions. These functions include sediment filtering, bank building, water storage, aquifer recharge and hydrologic energy dissipation. PFC is a prerequisite to achieving desired condition (USDI 1998). As described in the previous paragraph, use of the PFC methodology to assess function is recognized as an early indicator of water quality trends. Streams or wetlands that are categorized as PFC or Functional-At-Risk (FAR) with an upward trend are heading in the right direction towards meeting desired future condition, but may not necessarily meet water quality standards. The Dillon Resource Management Plan and Record of Decision of 2006 predict the achievement of desired future condition in 20 to 50 years.

The BLM’s watershed approach of assessing land health, also known as ecosystem function, can be a leading (early) indicator to guide adaptive management as opposed to traditional water quality monitoring which is seen as a lagging indicator. Land health assessments are very well designed to assess the physical and biological integrity of our Nations waters. As part of the MOU, the BLM reports to DEQ actions taken to address NPS water pollution as well as effectiveness of Best Management Practices (BMPs). Water Quality Monitoring is conducted on Public Land by Montana DEQ as part of their responsibilities under the Clean Water Act. Additionally, as discussed in the Aron paper, the BLM has entered into a cooperative water quality monitoring agreement shifting some of the workload to Montana DEQ and freeing the BLM to focus more attention to watershed function.

In conducting watershed assessments with respect to nonpoint water pollution, upland, forest, wetland and riparian assessments are used to determine how BLM management is affecting water quality. The BLM evaluates uplands for land cover condition (ability of plants, rocks, and litter to protect soil from erosion, promote infiltration and reduce runoff). Wetlands are assessed to determine their extent and condition and their ability to recharge ground water, cycle nutrients, filter sediments, promote infiltration and mitigate flooding. Streams and their adjacent riparian areas are evaluated to determine channel morphology and stability, access to floodplains, ability to move sediment, species composition and condition of riparian vegetation. Wells, pipelines and spring developments are recognized as BMPs, and are evaluated to determine condition and effectiveness. Due to the extent of stream miles in the Dillon Field Office, temperature monitoring is limited to selected streams. PFC assessments also provide clues to stream temperature. Shallow, over-widened streams with limited vegetation receive more solar radiation and are more at risk for thermal impacts than deep, narrow, well vegetated streams. Improvements in channel condition and riparian cover directly correlate to reductions in thermal impacts. As stated above, PFC is an early indicator of water quality and a prerequisite to

achieving desired condition. The assessment team also looks at current and historic mining, timber harvests, abandoned beaver dams, erosion from roads, and concentrated livestock waste. Since the BLM uses the Land Health Assessment process to identify early indicators of nonpoint pollution as well as BMP assessments, and since these areas are covered by other key issues in this document, Water Quality and TMDLs have been considered and eliminated from further consideration as key issues in this document.

Abandoned Mine Lands

The Abandon Mine Lands (AML) program is an ongoing program which has been addressing legacy mining issues throughout southwest Montana. The BLM will continue to address AML features in the CW on a priority basis. Separate NEPA documentation will be completed to address legacy mining issues.

Soil Compaction

Soil compaction was rated as none to slight on the upland sites assessed during upland health assessments in the watershed, but was noted as a minor concern in some localized riparian and wetland areas. The ID team agreed that soil compaction wasn't an issue in upland habitats and that it would be adequately analyzed under Key Issues. Changes in riparian/wetland vegetation cover, composition and vigor and the relative amount of bare ground will be measured as a surrogate to measure soil compaction in riparian and wetland areas. Activities to improve forest health may cause localized, short term soil compaction that would be mitigated through project design and BMPs. Therefore, soil compaction was not carried forward as a separate issue.

Wildlife

Wildlife species and their habitats in the CW were considered during the assessment. Since not all wildlife and their associated habitat had concerns, not all were included in this EA as an issue or resource concern, and are not analyzed if they are not affected. Several wildlife species, including a variety of birds, utilize the same habitats that are included as issues. While not every species is mentioned in the impact analysis, the effect to those species is similar to that of species that are included and analyzed (i.e. impact on foraging, cover, nesting, etc.). Particular habitat requirements and levels of dependence on these habitats vary by species and in general, the group is often represented by an "umbrella" or "focal" species whose habitat needs represent the needs of other species (i.e. sagebrush obligate species represented by sage grouse since they use a diversity of habitat).

Areas of Critical Environmental Concern (ACECs)

Two ACECs are located within the CW. These ACECs were considered to be included as an Issue or Resource Concern, but were eliminated because they have special management outlined in the Record of Decision (ROD) and Approved Dillon RMP. The ROD and Dillon RMP can be found at: http://www.blm.gov/mt/st/en/fo/dillon_field_office/rmp/rod.html

The special management identified for these ACECs will be adhered to in the development of management alternatives. In addition, the relevant and important values within these ACECs will be addressed in other Issues and Resource Concerns (i.e. Special Status Species Habitat, Forest and Woodland Habitat, Upland and Sagebrush Steppe Habitat, Riparian, Wetland and Aquatic Habitat, and Visual Resource Management).

The Centennial Mountains ACEC includes the public lands lying south of the Centennial Valley road from Red Rock Pass to the West Fork of Corral Creek. There are approximately 40,715 acres of public land in this ACEC. About 55% of the area is also included in the Centennial Mountains WSA. The area is an ACEC based on the habitat it contains for grizzly bear, lynx and wolf, its use as a wildlife migration corridor, its outstanding scenic value, and for the only known occurrence in Montana of Whipple's beardtongue. The area provides relatively intact habitat with limited evidence of human-caused impacts, and provides an important route for wildlife migrations and movement between high security habitats. Special management is defined for this area on page 21 of the Dillon RMP.

The Centennial Sand Dunes ACEC (also called Centennial Sand Dunes or Centennial sand hills) is located six miles north of Lakeview, Montana. There are approximately 1,040 acres of public land in this area. The area contains one of only two sand dune complexes in Montana, and provides habitat for special status plant species. The area supports ecological processes related to sand dune migration, which provides habitat for several special status plant species including sand wildrye, Fendler cat's eye, and painted milkvetch. Loss of sand dune activity and other disturbances could put these values at risk. Special management stipulations are defined on page 22 of the Dillon RMP.

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

1.4.1 Scope

The scope of the proposed action includes authorizing livestock grazing, implementing commercial and non-commercial vegetation treatments, prescribed burning, and minor changes in travel management within the CW. The proposed action addresses several program areas that affect land health. Proposed vegetation treatments are designed to restore specific habitat types on public lands. The proposed action may also include installation, construction, removal or modification of fences, water developments for livestock, road construction, and stream crossings (including culvert placement or replacement).

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

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

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

The proposed actions are in conformance with the Federal Land Policy and Management Act, the Taylor Grazing Act, the Standards for Rangeland Health and Guidelines for Grazing Management (43 CFR 4180), Manual 6330-Management of Wilderness Study Areas and BLM policies and Federal regulations.

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

This document is not tiered to the 1984 Mountain Foothills EIS but the Mountain Foothills EIS serves as a reference for this document. Applicable portions of the information and analysis found in the Mountain Foothills EIS is a valuable resource and was used during the development of the Centennial Watershed EA.

Also considered and adhered to during alternative development were the goals, objectives and management recommendations specified in these documents:

- Interagency Memorandum of Understanding and Conservation Agreement for Cutthroat Trout in Montana.
- BLM’s National Sage Grouse Strategy
- Greater Sage-Grouse Interim Management Policies and Procedures No. 2012-043
- Management Plan and Conservation Strategies for Sage Grouse in Montana
- 2010 Nonpoint Source Memorandum of Understanding between the BLM and the Montana Department of Environmental Quality (DEQ)
- IM No. MT-2014-067, Montana/Dakotas Special Status Species List.
- BLM Manual 6840 - Special Status Species Policy.

1.4.3 Critical Elements of the Human Environment

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

Table 1.2 Critical Elements of the Human Environment.				
Critical Element	Not present	Present, but not affected	May be affected*	Comments
Air Quality			X	Discussed under Resource Concern #8 – Air Quality
Areas of Critical Environmental Concern (ACEC)			X	Alternatives within the Sand Dunes ACEC and Centennial Mountains ACEC will be analyzed to meet special management prescribed for these ACECs in the Dillon RMP. Discussed under 1.3.1 Key Issues of Resource Concerns considered but eliminated.
Cultural & Paleontological Resources		X		See features common to all alternatives in section 2.3.1, and a broader discussion of Cultural & Paleontological Resources in section 3.2.8.
Environmental Justice		X		No low income or minority groups would be disproportionately affected.
Farmland (prime or unique)		X		Prime or unique farmland will be conserved through actions that address Land Health Standards

Table 1.2 Critical Elements of the Human Environment.

Critical Element	Not present	Present, but not affected	May be affected*	Comments
Floodplains ¹			X	Discussed under Issue # 1 – Riparian, Wetland and Aquatic Habitat.
Hazardous and Solid Wastes	X			
Invasive Non-native Species			X	Discussed under Resource Concern #1 - Noxious and Invasive Species
Native American Religious Concerns	X			Tribes familiar with the area have expressed no religious concerns.
T&E species			X	See BE for T&E and BLM Sensitive Species in Appendices C (plants) and D (fish and wildlife). Also discussed under Issue #4 – Special Status Species Habitat
Water Quality (drinking or ground)			X	Discussed under Issue # 1 – Riparian, Wetland and Aquatic Habitat and also 1.3.1 Issues considered but eliminated.
Wetlands/Riparian Zones			X	Discussed under Issue # 1 – Riparian, Wetland and Aquatic Habitat.
Wild and Scenic Rivers	X			
Wilderness Characteristics			X	Discussed under Resource Concern #7 – 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.				

1.5 Decisions to be Made

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

The Dillon Field Manager will choose the alternative that best addresses issues and resource concerns identified by the BLM and through public scoping, and allow for multiple use. The Dillon Field Manager must also determine if a selected alternative is a major Federal Action that significantly affects the quality of the human environment. If she/he determines that it is, then an EIS must be prepared before the CW management plan can proceed.

Implementation of the Decisions issued as a result of this EA may begin in 2016, but full implementation may take several years and is subject to budget constraints. The decisions will be implemented in consultation and coordination with the affected permittees, the agencies having lands or managing resources within the area, and other interested parties. As with all

similar BLM decisions, affected parties will have an opportunity to protest and/or appeal these decisions.

1.6 Applicable Legal and Regulatory Requirements

- Title 43, Code of Federal Regulation, Part 4100.
- Taylor Grazing Act of June 30, 1934, as amended.
- Sikes Act of 1960, as amended (Habitat improvement on Public Land).
- 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.
- Clean Air Act of 1967 as amended 1970, 1977, 1990.
- Public Rangelands Improvement Act of October 25, 1978.
- Fish and Wildlife Improvement Act of 1978.
- State of Montana Streamside Management Zone Law of July 1991.
- National Fire Plan of 2000.
- Healthy Forests Initiative of 2002.
- Healthy Forests Restoration Act of 2003.
- Dillon Resource Management Plan of 2006.
- Management of Wilderness Study Areas (manual 6330), 2012.
- Paleontological Resources Preservation Act of 2009.

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

Chapter 2

2.0 Description of Alternatives

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

2.1 Process Used to Formulate Alternatives

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

2.2 Alternatives Considered but Eliminated from Further Analysis

Alternatives that would not make significant progress toward meeting the objectives of the proposed action (section 1.2), or are not consistent with the intent of current BLM legal and regulatory requirements or policy, are not fully analyzed in this document. Alternatives that propose exclusive utilization, development or protection of one resource at the expense of other resources are not considered. FLPMA mandates the BLM to manage public lands for multiple use and sustained yield. This eliminates alternatives such as closing all public land to livestock grazing, oil and gas leasing, or managing only for wildlife values at the exclusion of other considerations. In addition, resource conditions in the CW do not warrant watershed-wide prohibitions of any specific use. Each alternative considered in this EA allows for some level of support, protection, and/or use of all resources present in the planning area. The following alternatives were considered, but eliminated from detailed study.

2.2.1 Elimination of Livestock Grazing on BLM Administered Lands on all grazing allotments in the CW

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

- Eliminating livestock grazing from all BLM administered lands in the watershed does not meet the purpose and need of this EA or the intent of the Taylor Grazing Act, Public Lands Improvement Act, FLMPA or the mission of the BLM.
- Resource conditions within the CW do not warrant elimination of livestock grazing on a watershed wide basis. (i.e., Upland health was met on 33 of the 36 allotments and all five Rangeland Health Standards were met on 30 of the 36 allotments within the watershed).
- The 2006 Dillon RMP identifies 74,610 acres of public land in the CW available for livestock grazing and about 8,500 acres of land as unavailable or unallotted to livestock grazing, so a watershed wide “No Grazing” alternative would not be consistent with the Dillon RMP.
- A Land Use Planning level “No Grazing” alternative was previously analyzed in the Mountain Foothills EIS (March 1980). Although this EIS is 36 years old, important portions of the analysis within the EIS are still relevant, (i.e. Approximately 2,700 miles of new fence construction would be necessary to eliminate livestock grazing on public land within the Dillon Field Office).
- Due to the intermixed land ownership pattern in the CW grazing allotments, at least 150 miles of fence would need to be constructed between private and/or state land and BLM administered land to effectively implement a “No Grazing” alternative. This figure does not include fencing around parcels that are essentially unavailable to livestock due to topography. Surveying and constructing 150 miles of fence along BLM boundaries would be cost prohibitive. In addition, 150 miles of fence along BLM boundaries would cause an unacceptable level of barrier/entanglement hazard for big game and a hazard for sage grouse by increasing the chance of collision. Access to public land may be reduced due to locked gates located along boundary fences that cross private roads.
- Fencing public lands would create numerous small isolated parcels, and management of these tracts would be problematic. Isolated and publically inaccessible tracts could result in an expanded public land exchange and/or sales policy in an attempt to block up public land and provide access. This process would be very time consuming, extremely expensive and could result in a net loss of public land for recreation, wildlife habitat, timber harvest, fire wood gathering and other multiple use activities.
- Eliminating livestock grazing on all public within the Centennial Watershed would have a substantial adverse economic and social impact on the ranch operations and many of the landowners in the Centennial Valley. The economic impact would carry over to some degree to the businesses in the local area and tax revenue within Beaverhead County. The permittees may be forced to operate with fewer livestock, graze private and/or other available lands more, or even sell a portion of, or the entire livestock operation. If the business is sold, private lands associated with the ranch have the potential to be sold and developed. Ranches build connections between public and private land, and between rural and urban communities. “Private lands are disproportionately important to the maintenance of our region’s natural heritage because they are disproportionately more productive” (Knight 2007). Private lands often contain springs, riparian, rich soils, and/or critical habitat that wildlife depends on. A few of the consequences from development of rural lands are landscape level fragmentation, decreased access to public lands, decrease in biodiversity, loss of important wildlife habitat and development in the Wildland Urban Interface. The elimination of grazing from public land can have a long term effect on the environment and economy by forcing ranchers to produce more meat

on private or leased land, thus increasing the potential need for fertilizers, supplement feeds and water for irrigation that requires more energy from fossil fuels and electricity than on rangelands (Journal of Range Management 27(3), May 1974). In addition, the BLM would still incur a workload to monitor compliance to non-use of the public land within the CW.

- Eliminating livestock grazing would also result in a build-up of fine fuels which would increase the likelihood of wildfires (both natural and man-caused) moving faster and spreading further within the public lands as well as adjacent private lands.

2.2.2 Elimination of Livestock Grazing on the Fish Creek Allotment

A no grazing alternative was considered for the Fish Creek Allotment (See Appendix A, Map #6). It was considered because this allotment did not meet the BLM's Riparian Health and Water Quality standards and is 100% public land (55% BLM, 45% Montana DNRC). The total acreage of the Fish Creek allotment is 7,676 acres. It was determined that livestock grazing was a causal factor in not meeting the Riparian Health standard.

Although the entire allotment is public land, the missions for BLM and Montana DNRC are different. For BLM to eliminate grazing on this allotment, about six miles of fence would need to be constructed to separate Montana DNRC lands from BLM administered lands. Most of these six miles of fence would be in steep, rocky terrain. Supplies and construction cost for six miles of fence in steep, rocky terrain along BLM boundaries is approximately \$10,000/mile (\$60,000). In addition, BLM policy states that any time a fence is constructed along jurisdictional boundaries, the BLM boundary must be professionally surveyed. To survey six miles in this area would cost \$80,000 to \$120,000. Constructing a fence to eliminate livestock grazing on public land would be cost prohibitive. Aside from the cost, these fences would be dangerous barriers and entanglement hazards for big game, as well as posing a collision hazard for sage grouse within the Fish Creek allotment.

Eliminating livestock grazing would have an adverse economic impact on the ranch operation currently authorized to graze livestock in the Fish Creek Allotment. The BLM would still incur a workload to monitor non-use compliance on the public land in the allotment and to maintain the fence because no grazing permittee would be assigned to maintain the fence. A build-up of fine fuels would increase the likelihood of wildfires (both natural and man-caused) moving faster and spreading further within the allotment. In addition, there are seven stream reaches in the Fish Creek Allotment. Five of these stream reaches are on Fish Creek or Long Creek which are larger perennial streams. These five stream reaches rated as PFC. Two reaches make up Metzel Creek. One reach of Metzel Creek is a small, low energy, intermittent/interrupted stream system and the other is an ephemeral system. Metzel Creek is not a high priority stream and is not hydrologically connected to a larger system. For these cumulative reasons, elimination of livestock grazing within the Fish Creek allotment was eliminated from full analysis.

2.2.3 Elimination of Livestock Grazing in the Long Creek AMP Allotment

A "no grazing" alternative was considered for the Long Creek AMP allotment because it did not meet the Riparian Health and Water Quality standards and livestock grazing was determined to be a causal factor in not meeting the standards (See Appendix A, Map #8). This alternative was not fully analyzed because all five Rangeland Health Standards were met in two of the three

pastures in the Long Creek AMP Allotment and resource concerns were identified only in the West Creek Pasture, which is effectively separated from the other two pastures by fences. A “no grazing” alternative will be fully analyzed for the West Creek Pasture where the resource concerns were identified under alternative C.

2.3 Description of Alternatives Considered

2.3.1 Features Common to All Alternatives, Including the No Action

Livestock Management

New ten-year term grazing permits/leases will be reissued for twenty-five grazing allotments that have been determined to not have resource issues or concerns relating to current livestock management. No changes to the mandatory terms and conditions of the permits/leases, and/or new rangeland improvement projects will be proposed or analyzed for these allotments. The allotments are: 7L SGC, Bean Place, Brundage Bridge, Cayuse, Centennial, Centennial Isolated, Curlew, Davis SGC Common, Duff Creek AMP, Jones SGC, Lima Reservoir AMP, Long Creek SGC, Mata-stib SGC, McCandless Brothers SGC, Monida-Corral Creek, Monida Hill, Mud Lake, Oxbow, Passmore SGC, Price Creek, Ritchie, Saier Individual, Sand Dunes, Shineberger and Tom Creek. The permittees on these 25 allotments have satisfactory performance records.

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

All Term Grazing Permits will be amended to state that depredations from grizzly bears or wolves are possible on the allotments.

Fences

- Existing BLM fences that impede wildlife movement will be modified or rebuilt to BLM specifications on a prioritized schedule.
- Dysfunctional or unnecessary fences on public land will be removed, specifically in the Curlew and Rody allotments.
- Permittees shall provide reasonable administrative access across private and leased lands to the BLM for the orderly management and protection of the public lands.

Water Developments

- All water developments and troughs no longer in use will be removed, but spring enclosure fences may be retained and maintained.
- Functional spring developments will be maintained prior to the livestock grazing season of use for each specific allotment (4130.3-1(c)). Annual maintenance projects could include: repairing wire or wood enclosure fences, cleaning out head boxes, removing dirt and debris from water troughs, repairing plumbing hardware, fixing damaged posts and braces and ensuring wildlife escape ramps are present, accessible and functional.

Drought

- During years when precipitation is below average and biomass production is considerably reduced, the Dillon Field Office will follow the BLM drought policy Titled “Bureau of Land Management, Policy for Administering Public Land Grazing in Montana, North and South Dakota During Periods of Drought and the BLM’s National Drought Policy which is outlined in Washington Office Instruction Memorandum 2013-094.

Forest and Woodland Treatments

Personal use firewood permits and Christmas tree permits will continue to be issued. The following will also continue for 5-Needle Pine Treatments:

- Cones will be collected on whitebark and/or limber pine trees suspected to be resistant to white pine blister rust and will be sent for testing to determine their resistance level and/or stored for future planting.
- Pheromones (e.g., verbenone) will be applied to selected trees to protect them from attack by mountain pine beetle. (Refer to Pheromone Use in the Dillon Field Office EA #DOI-BLM-B050-2011-007-EA).
- Additional cones will be collected as funding and cone crops allow. This seed may be sent to the national seed bank and genetic restoration program and/or incorporated into an office-wide operational collection that has been banked for future management efforts.

Fire Management

Wildland fire management within the Centennial watershed will be implemented in accordance with the 2006 Dillon RMP. The Centennial watershed is classified under fire management Category C within the RMP. Category C identifies “areas where fire is desired to manage ecosystems, but there are significant constraints that must be considered for its use.” Those constraints may include: loss of livestock forage, wildlife seasonal habitat and migration corridors, sensitive species habit, and the fragmentation of sagebrush habitat from private land uses.

Travel Management and Roads

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

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

Noxious and Invasive Species

Management of noxious weeds will continue in cooperation with Beaverhead County, federal and state agencies, private landowners and other partners. All invasive species on the Montana noxious weed list will be treated on a prioritized basis to the degree financial resources allow. An average of 50 acres in the Centennial Watershed would be treated with herbicides annually,

pending funding. Roads, trails and washes as well as areas where private landowners actively cooperate, participate, and support the BLM's weed management strategies, will be given a higher priority for treatment.

Special Status Species

BLM will continue to participate with cooperative WCT and arctic grayling restoration projects within the Centennial Watershed. The BLM, in cooperation with other agencies and partners, will continue to monitor all known sage grouse leks. In areas where sage grouse use may be more concentrated, such as is close proximity leks or wintering areas, fences will be marked so they are more visible and collision with wires is reduced. The BLM will maintain existing sagebrush habitat so that 70% or more of big sagebrush communities provide vegetative composition and structure for sagebrush obligate species and sagebrush canopy cover of 15-25% with an average of 6 to 7 inches of herbaceous understory for nesting/early brood rearing and maintain or increase composition of highly nutritious forbs (e.g. composites and legumes) in nesting/early brood rearing habitat within site potential (2006 Dillon RMP).

Wilderness

There is no congressionally designated wilderness within the Centennial Watershed planning area. The 27,691 acre Centennial Mountains Wilderness Study Area will continue to be managed in accordance with BLM Manual 6330, *Management of BLM Wilderness Study Areas* until such time as it is either designated as wilderness or released from further consideration as wilderness by Congress. BLM Manual 6330 replaces the Interim Management Policy for Lands Under Wilderness Review, but retains the overarching guidance of managing to preserve the wilderness characteristics that existed at the time of the original wilderness inventory from the early 1980s. This policy is referred to as the "non-impairment" policy.

Recreation

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

Cultural and Paleontological Resources

As required by Section 106 of the National Historic Preservation Act, a Class III cultural resource inventory is required prior to the implementation of any proposed range or habitat improvement projects. Should significant cultural resources be identified, impacts would be mitigated through project abandonment or redesign. Care would be taken to avoid and protect significant cultural resources and any standing structures (should they be present) during the course of any proposed project. As required by the Paleontological Resources Preservation Act, a paleontological inventory is required in areas with a high potential for paleontological resources prior to the implementation of any proposed range or habitat improvement projects. Should paleontological resources be identified, impacts would be mitigated through project abandonment or redesign. In addition, personnel from the BLM should be notified of the presence and location of any cultural or paleontological resources encountered by contractors or lessees during the course of operations on public lands.

Monitoring

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

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

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

Livestock Grazing Management

Under Alternative A, livestock management would continue under the current Terms and Conditions in all 36 grazing allotments (Table 2.1). No new range improvement projects would be constructed.

Allotment Name, Number, and Category	Livestock Kind	Season of Use	Grazing System ¹	BLM Stocking Rate	BLM Acres	BLM AUMS	Acres in Other Ownership ²	Total ³ Acres
71 SGC 20153, (C)	Cattle	06/01-11/30	CU	2.2	343	157	More than 1,000 PVT	1,343
Antelope Peak, 20179, (I)	Cattle	06/01-11/30	DR	4.1	2,338	567	3,481 PVT	4,048
Bean Place, 10125,(C)	Cattle	06/01-09/01	CU	3.5	129	37	More than 1,000 PVT	1,129
Brundage Bridge, 20707, (C)	Cattle	05/01-11/30	CU	2.9	382	130	More than 1,000 PVT	1,382
Brundage Creek, 20708, (M)	Cattle	05/01-10/30	DR	4.5	4,118	912	640 St 800 PVT	5,558
Cayuse, 03234, (I)	Cattle	05/01-11/16	RR	8.2	475	58	684 PVT	1,159
Centennial, 20710, (M)	Cattle	05/01-12/15	RR	5.5	527	95	2,419 ST 2,615 PVT	5,561
Centennial Isolated, 20641, (C)	Cattle	05/01-12/15	CU	5.7	40	7	2,615 PVT	2,655
Cocanougher Ind., 10738, (C)	Cattle	04/25-10/31	RR	4.5	45	10	707 PVT	752
Curlew, 20199, (C)	Cattle	06/01-10/30	CU	1.5	181	122	More than 500 PVT	681
Davis SGC Common, 10737, (C)	Cattle	05/01-10/15	STG	25	446	18	94 PVT	540
Duff Creek AMP, 20688, (M)	Cattle	05/01-12/15	RR	32	3,344	106	More than 1,000 UFSWS	3,344
Fish Creek, 20172, (I)	Cattle	06/13-10/22	DR	7.2	3,706	514	3,023 ST 947 PVT	7,676
Jones SGC, 20731, (C)	Cattle	05/01-12/15	CU	4.7	122	26	158 PVT	280
Lima Reservoir AMP, 10151, (M)	Cattle	05/01-12/15	DR	6.5	5,122	793	2,517 State 2,500 Private	10,139

Allotment Name, Number, and Category	Livestock Kind	Season of Use	Grazing System ¹	BLM Stocking Rate	BLM Acres	BLM AUMS	Acres in Other Ownership ²	Total ³ Acres
Long Creek AMP, 20154, (I)	Cattle	05/01-12/15	RR	3.3	4,476	1,345	1,023 ST 1,911 PVT	7,410
Long Creek SGC, 20157, (C)	Cattle	05/01-12/15	CU	2.9	117	41	More than 1,000 PVT	1,117
Lousy Springs, 00763, (C)	Cattle	05/01-11/30	DR	5.6	621	110	219 ST 23 PVT	863
Mata-stib SGC, 10696, (C)	Cattle	05/01-12/15	CU	5.2	472	90	1,000 ST	1472
McCandless Brothers SGC, 20185, (C)	Cattle	06/01-10/31	CU	3.8	300	79	2,500 ST 549 PVT	3,349
Monida-Corral Creek, 00766, (C)	Cattle	06/01-09/01	CU	2.4	72	30	More than 1,000 PVT	1,072
Monida Hill, 20023, (I)	Cattle	06/01-10/31	RR	11	6,462	607	More than 1,000 PVT	7,462
Morton Ind./SGC, 20163, (C)	Cattle	05/15-11/14	CU	43	470	11	268 PVT	738
Mud Lake, 30260, (M)	Cattle	06/01-10/31	DR	6.5	1,083	166	649 ST 1,474 PVT	3,206
Oxbow, 20735, (I)	Cattle	05/15-11/16	RR	3.4	3,254	952	5,428 PVT	8,682
Passmore/SGC, 20183, (I)	Cattle	09/01-09/15	RR	5.2	83	16	None	83
Peet Creek, 10730, (I)	Cattle	05/15-11/14	DR	21	4,750	231	713 ST 2,269 PVT	7,732
Price Creek, 30040, (I)	Cattle	06/15-10/15	RR	10	14,562	1,468	365 PVT	14,927
Red Rock, 30636, (M)	Cattle	04/01-02/28	STG	3.1	267	86	86 PVT	353
Ritchie SGC, 30610, (C)	Cattle	05/01-11/30	CU	9	160	18	More than 1,000 PVT	1,160
Rody Individual, 20685, (C)	Cattle	07/01-10/30	CU	21	414	20	40 PVT	454
Saier Individual, 20169, (M)	Cattle	05/01-12/15	STG	3.1	321	104	640 ST	321
Sand Dunes, 20732, (M)	Cattle	05/01-12/15	Planned grazing to benefit rare plants	6.2	665	107	5 PVT 118 ST	670
Shambo Units, 20152, (I)	Cattle	07/01-11/30	RR	10	11,660	1,146	2,236 PVT	13,896
Shineberger, 20159, (C)	Cattle	04/01-11/14	STG	1.8	277	151	366 PVT	643
Tom Creek, 20701, (M)	Cattle	06/08-10/15	CU	165	2,806	17	More than 2,000 PVT	4,806
BLM Totals					74,610	10,347		126,663

¹Grazing System: RR=rest rotation, DR=deferred rotation, STG= short term grazing system, CU=custodial use.
²Other Ownerships: ST=Montana DNRC, PVT=Private.
³Total Acres are an estimate. The total acres in the allotment may not be completely accurate because BLM doesn't have legal access to map allotment boundary fences on private lands.

All allotments in the Dillon Field Office have been categorized as *Improve* (I), *Maintain* (M), or *Custodial* (C).

Other Authorized Activities

Under the No Action Alternative, all other currently authorized activities (recreation permits, mineral development, etc.) would continue as permitted. No new structural projects would be constructed. No new forest and woodland treatments, other vegetative treatments, or changes to travel management designations would be implemented.

2.3.3 Features Common to All Action Alternatives

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

Management alternatives proposed will aim at bringing forested and sagebrush habitat within the historic range of variability for vegetation composition, canopy and structure, and support a diversity and abundance of dependent wildlife species, especially special status species (2006 Dillon RMP).

Livestock Management

Grazing Management and Permit Administration

- Livestock management changes would be initiated during the 2016 grazing season. Implementation which is dependent on other proposals, e.g. rangeland projects, may take up to five years, due to financial, logistical, or other constraints.
- AUMs reduced from current active use would be held in suspended non-use on the revised Term Grazing Permits.
- Annual utilization guidelines on cool season upland and riparian bunch grasses would be 50% (to maintain plant health/vigor).
- Utilization by livestock of sedge species in the riparian greenline (area of vegetation adjacent to the channel) on non-fisheries or non-native fisheries streams would leave a minimum of four inches. On WCT streams the guideline would be to maintain a herbaceous stubble height of at least 6 inches along the greenline and 3 inches on the flood plain to manage for the long term viability of remaining Westslope Cutthroat trout populations.
- Annual use guidelines would be included to the terms and conditions of the term grazing permits, and would be applicable to all allotments in the CW as a tool to determine moves between pastures and/or off the allotment, and in conjunction with long term trend data to determine management effectiveness.
- With prior approval, flexibility would be authorized for the season of use on each allotment if annual weather conditions and forage production warrant. The season of use begin and end dates may be adjusted up to seven days earlier or later than specified on the permit due to yearly variations in weather affecting forage production. Livestock may need to be removed from a specific pasture prior to the maximum number of days specified in the grazing schedule. If this occurs, the time allocated in subsequent pastures would be adjusted proportionally. Conversely, if annual production is unusually high, livestock may be allowed to remain in a given pasture for up to five additional days and the remainder of the rotation schedule adjusted accordingly.
- After consultation with the BLM, and written approval, the planned pasture grazing sequence (e.g. pasture rested) and/or season of use may be adjusted on a short term basis

due to drought or other unforeseen natural events (e.g. flooding, wildfire). Authorized AUMs would not be exceeded by allowing this flexibility.

- With prior approval, more livestock may be grazed for a shorter period within the authorized season of use. However, the maximum authorized AUMs, as specified in the Term Grazing Permits cannot be exceeded by allowing this flexibility.

Rangeland Improvement Projects

Fences

- Any new or replacement boundary fences would normally be a four-wire fence and any new interior (pasture) fences would normally consist of three wires, constructed in conformance with BLM Fencing Handbook H-1741-1.
- All old materials (wire, steel and wood posts, etc.) would be cleaned up and removed when fences are re-built, maintained or abandoned.
- High tensile electric fences would be considered in areas where they may provide an effective alternative to traditional barbed wire construction. These would also be constructed in conformance with BLM Fencing Handbook H-1741-1.
- Fences around springs or tanks would be modified to prevent avian predators from using posts as hunting perches. Modifications include installing spikes or cone-tops to wood posts, replacing wood posts with metal t-posts, and using metal t-posts instead of wood posts and jack and rail, where practical.
- New fence construction that is determined to be in a high use area for sage grouse would be marked with flight diverters to reduce collisions.

Water Developments

- Prior to applying for surface water rights, recognizing that the CW lies in a Closed Basin, the BLM would confer with Montana Department of Natural Resources and Conservation (DNRC) and follow DNRC guidance to determine water right feasibility. If feasible, the BLM would file an Application for Beneficial Water Use Permit. DNRC form 600, would be filed prior to construction for surface water appropriations. DNRC would be consulted early in the process in an effort to complete the projects in a timely manner.
- Notice of Completion of Groundwater Development, DNRC Form 620 Exempt Well, would be submitted for groundwater developments (developed springs and drilled wells), with a maximum use of 35 GPM and 10 AC-FT or less post construction.
- Application to Change a Water Right, DNRC Form 606, would be filed prior to adding new tanks (points of use) to projects with existing Statements of Claim, Beneficial Water Use Permits or Notices of Completion of Groundwater Development.
- All old materials (pipeline, troughs, head boxes, etc.) would be cleaned up and removed when springs are re-developed, maintained or abandoned.
- Prior to developing water resources all applicable State and Federal Permits would be obtained and the terms and conditions applied.
- Flow measurements, i.e., gallons per minute, would be collected on all springs which are being considered for development. Springs that have inadequate flows to provide a reliable water source for authorized livestock, while maintaining wetland/riparian habitat would not be developed. Adequate water would be left at the spring source to maintain wetland hydrology, hydric soils, and hydric vegetation.

- Spring sources and associated riparian wetland habitat would be fenced to exclude livestock use on new spring developments.
- No new permanent roads would be authorized in conjunction with new water developments. Permit holders may be authorized to travel along pipeline routes to perform maintenance as defined in the term grazing lease.
- Soil disturbance resulting from project construction would be seeded with a native seed mix during the fall, following construction.

Forest and Woodland Treatments

Commercial Harvest Treatments

The following design features would be common to all commercial harvest treatments.

- Montana Forestry Best Management Practices (BMPs) and the State of Montana Streamside Management Zone (SMZ) law and rules would be followed for all treatments or road construction/maintenance activities in or near riparian areas. Guidelines as described in the Montana SMZ law (available at <http://www.mt.nrcs.usda.gov/technical/ecs/forestry/technotes/forestryMT18/>) would be the minimum standard design features, unless alternative practices authorizations are obtained.
- If market conditions permit, biomass material may be removed from within treatment units. Sufficient residual biomass material would be left on site to maintain nutrient recycling and desirable micro-site conditions.
- Existing roads which are not designated open routes may be used for Forest and Woodland Treatments, and would be physically closed following completion of use.
- Forest and Woodland Treatment units would be monitored for noxious weeds and cheatgrass and treated if necessary.
- Forest and Woodland Treatment units would be surveyed for goshawk and great gray owl nesting prior to implementation. If a goshawk or great gray owl nest is found in a treatment unit, timing stipulations would be enforced to avoid disturbing nesting activity.
- Foresters, fuels specialists, and wildlife biologists would coordinate the timing of forest and woodland treatments (seasonally and yearly), and the area treated per year to minimize conflicts with wildlife (i.e. elk calving habitat). If warranted, seasonal timing restrictions may be specified in treatment contracts/and or burn plans.
- A food storage stipulation would be included in timber harvest contracts to reduce conflicts with bears.
- Treatment areas for commercial harvest are shown on Appendix A, Map #2. Actual harvest units would be within these areas identified, but would not cover the entire acreage within. In addition, some commercial harvest unit boundaries may overlap with prescribed burn units.
- Sale contract terms would be between 12 -36 months. Factors influencing timing would be dependent on the size of the treatment unit, wildlife issues, and/or area closures.
- Conventional ground-based or helicopter harvesting equipment would be used. Ground based harvest techniques would include hand or machine felling (on slopes <45%) and then tractor and/or cable yarding the merchantable timber to landings. Ground-based harvest equipment generally requires yarding distances of up to 1,500' for practical operations and access to log landings.

- Standard timber sale contract provisions which provide protection from erosion, sedimentation, and soil compaction would be adhered to. Timber sale contracts would be made available to the general public upon advertisement.
- Off-road vehicles and equipment would be required to be pressure washed to remove weeds and weed seeds prior to starting operations.
- Log landings would be located in areas free of, or treated for, noxious weeds. Upon completion of use, landings would be reseeded with native grasses/forbs.
- Use of existing roads would be evaluated on a case-by-case basis to determine if additional safety and/or watershed protection measures would be needed. Upgrades may include, but would not be limited to: blading, filling in low spots, installing drain dips, removal of established vegetation within the ROW for sighting distances, and minor re-routes of up to 500 feet.
- Construction standards on new temporary roads would be to the minimum required for safe transport of merchantable material. Road locations would be designed to minimize the number of stream or wet area crossings. Exact road locations may be adjusted to avoid archaeological and/or sensitive plants and wet areas, to adhere to SMZ laws, to provide best access for yarding, or to reduce the amount of road building. Road mileage amounts identified in this EA would not be exceeded without additional NEPA clearance.
- All applicable State and Federal Permits required for the installation of stream crossings within the project area would be obtained, and permit conditions would be followed.
- All currently closed two-track and new temporary roads used for forest health treatments would be closed upon the completion of forest management activities, unless designated as open routes through changes to the DFO Travel Management Plan. Post-treatment road closures would be accomplished by constructing berms and/or placing slash material on the road surface to preclude vehicle use and reseeded with native grasses/forbs.
- Prescribed burning treatments to consume residual slash and/or to kill understory conifers less than 30 feet tall may be completed within all commercial harvest units, predominantly in Douglas-fir/mixed conifer stands.
- Disturbance to regeneration in old harvests would be minimized as far as is practicable. Exceptions may include but are not limited to: clearing of road ROW vegetation, landing areas, and designated temporary skid trails.
- Contract stipulations for temporary skid trails would address spacing and slopes allowed for trails as well as avoidance areas. Constructed trails may be allowed where necessary with restrictions based on local site conditions. Rehabilitation of constructed trails and any other main trails would be required upon completion of harvest operations.
- Haul routes for removal of commercial product would be determined by utilizing public access routes where feasible. Sale purchasers may elect to utilize access through private lands.

Stream Crossings

- All applicable State and Federal Permits would be obtained and all permit conditions would be followed for construction of stream crossings.
- The most appropriate stream crossings, e.g. culverts, hardened crossings or temporary bridges would be selected based on site specific conditions and impacts: floodplain fill, economics, road safety as well as impacts to stream channel and vegetation.

- Temporary and/or permanent culverts placed under roads would be adequately sized to maintain stream dimensions, patterns and profiles.

Non-Commercial Mechanical/Prescribed Fire

- As per 2006 Dillon Resource Management Plan, use both prescribed fire and mechanical treatments to treat conifer expansion in the non-forested habitat types including expansion in the Wilderness Study Areas where it is determined wilderness values would be enhanced.
- A burn plan would be prepared and approved prior to implementing prescribed fire treatments (See Appendix A, Map # 2).
- Treatments within Wilderness Study Area boundaries will be limited to primarily prescribed fire to ensure protection and enhancement of wilderness characteristics.
- One season of rest from livestock grazing may be needed prior to burning to allow sufficient growth of fine fuels (grasses) to ensure a successful burn. At least two growing seasons of rest from livestock grazing would be required following burns to allow re-growth and re-establishment of vegetation in the treated areas.
- Treatment units would be monitored for noxious weeds and cheatgrass and treated both pre and post treatment.
- Staging areas to complete treatment would be located in areas free of, or treated for, noxious weeds.
- Temporary fencing or hot tape (electric fence) may be used to allow the appropriate rest before or after a prescribed fire treatment.
- Units would be burned as fuel and weather conditions allow. Fire managers would coordinate the timing of prescribed fire treatments (seasonally) and the area treated per year to minimize public resource use conflicts.
- Fire managers and wildlife biologists would coordinate the timing of prescribed fire treatments (seasonally and yearly), and the area treated per year to minimize conflicts with wildlife (i.e. elk calving habitat).
- The implementation of prescribed fire treatments would occur over the next ten years.
- Burn units would be surveyed for special status species prior to the burning event and appropriate stipulations would be implemented to reduce impacts to these species.
- In allotments where prescribed burns occur, grazing AUMs would not be increased. However, livestock grazing distribution may change within the allotment due to increased palatability and availability of forage. No increases in AUMs are proposed in any grazing allotment in the CW where a prescribed burn is proposed.

Special Status Species

Special Status Plants (including five needle pine)

- Planting of whitebark and/or limber pine seeds or seedlings may be completed on a case-by-case basis in suitable habitats including, but not limited to: areas burned by wildfire, areas that have experienced extensive over-story mortality from mountain pine beetle and/or white pine blister rust, areas with low age class diversity, or where natural regeneration is not occurring within existing five needle pine habitat. Within the Centennial WSA, planting whitebark and/or limber pine seedlings would be done in accordance with the manual for BLM's Management of Wilderness Study Areas. The

goal of planting five needle pine seedlings would be to re-establish a viable population of native trees with some degree of resistance to non-native white pine blister rust.

- Outside the Centennial WSA, conifers within the vicinity of healthy whitebark and/or limber pine that are competing for available resources, or could cause damage in the event of wildfire, may be cut and left on site.
- Outside the Centennial WSA where natural whitebark pine regeneration is establishing, dead trees may be hand felled to protect against trampling (wildlife and/or livestock) in areas of concern. This would be isolated to small areas less than one acre in size and within areas that protection of the regeneration is a high priority (i.e. where mature tree mortality from mountain pine beetle or white pine blister rust is high).
- Use mechanical means (i.e. hand tools or tractor and disc) to destabilize sand dunes in several small (< one acre) localized areas throughout the Centennial Sand Dunes ACEC to create and maintain early seral habitat for sensitive plant species. Cumulatively, up to 50 acres may be treated.
- Activities that disturb mineral soil (such as blading, plowing, ripping, etc.) may not be allowed within the boundaries of populations of special status plant species. In habitats likely to support rare plants, field inspections would be conducted to search for special status plant species prior to authorizing surface disturbing activities. If rare plants are found in the course of the botanical survey, adverse impacts would be mitigated through project redesign or abandonment.

Special Status Fish and Wildlife habitat

- Remove the remains of the old logging bridge on Bean Creek in section T 15N, R. 3W, Section 31 and restore the stream channel to natural configuration.
- Continue stream temperature monitoring on an alternating year basis in Bean Creek to track potential changes that may result from the riparian conifer treatment.
- Continue WCT population monitoring on a five-year basis in Bean Creek to track potential changes resulting from the riparian conifer treatment.
- Initiate riparian willow/sedge restoration adjacent to Bean Creek within the riparian treatment area.
- Remove two peregrine falcon hawk towers on BLM administered lands located in sage grouse breeding and brood rearing habitat within the Oxbow and Monida Hill allotments.
- Seed forbs on approximately 50 acres within the Antelope Peak allotment where an unauthorized aerial spraying of sagebrush occurred and removed the forb component.

Figure 2.1 Odell Creek Drainage

- Remove conifer encroachment in riparian meadow habitat adjacent to portions of Bean, Bear, Peet and Price Creeks as described below.
 - A variety of tools would be used to treat up to five miles of riparian habitat to reduce/remove conifers within historic meadow areas along these riparian zones. Treatments would primarily target Douglas-fir and lodgepole pine (< 20" dbh) although some Engelmann Spruce up to 20" dbh may also be removed. No five-needle pine or larger Douglas-fir (>20" dbh) would be removed. Table 2.2 below outlines the proposed units, objectives, and treatment types for riparian conifer treatments. Unit locations and boundaries are shown on Appendix A, Map #3.
 - In riparian conifer treatments, the goal would be open up the meadow habitat along the riparian zone to facilitate the recruitment of more herbaceous and deciduous woody vegetation and retain these areas as open meadows instead of forested habitat. The width of the riparian zone varies widely depending on valley type, landform and vegetation.

- A range of 80 – 95% mortality of targeted conifer trees would be considered successful. No new roads or stream crossings would be constructed to complete the riparian conifer treatments.
- Mechanical treatment would consist of cutting down or girdling targeted conifer trees with chainsaws. Most of the felled conifer trees would be left on site to provide a browse barrier and stream bank protection. Specific trees may be felled across the stream to provide woody debris to help stabilize the stream channel. The remainder of the felled trees that are left on site would be oriented along the stream bank and not left across or within the high water mark of the stream channel.
- Severed Douglas-fir trees larger than 10” dbh would be cut into short sections (< 4’ long to prevent the felled trees from drawing Douglas-fir bark beetle to the site.
- Pre-treatment weed inventory/control and post treatment weed control would be completed within each unit.
- Effectiveness monitoring would be established in each treatment unit (refer to Appendix B for details).

Table 2.2 Riparian Conifer Treatments.					
Unit Name	Allotment	Reach Name & #	Miles	Objective(s)*	Treatment Type(s)
Bean	Shambo Units	300	.75	↓ conifer to improve riparian function, fish habitat and water quality and enhance biodiversity	Mechanical treatment (chainsaw)
Bear	Shambo Units	1645	.75	↓ conifer to improve riparian function and water quality and enhance biodiversity.	Mechanical treatment (chainsaw)
Price	Price Creek	350, 351, 349, 354, 356	2.0	↓ conifer to restore riparian function, increase aspen and enhance biodiversity.	Mechanical treatment (chainsaw)
Peet	Peet Creek	1654, 346, 344, 343, 345, 1655	2.0	↓ conifer to maintain riparian function and biodiversity and improve fisheries habitat.	Mechanical treatment (chainsaw)
TOTAL MILES			5.5		

* Abbreviations: ↑=increase ↓=decrease

Riparian, Wetland and Aquatic Habitat

- Work with MT FWP to re-locate beavers into drainages with adequate habitat to sustain the reintroduction.
- Pending the results of the current hydrologic research being completed by Montana State University and University of Montana-Western in partnership with TNC in Centennial Valley, construct beaver mimicry structures within stream reaches that the research shows would provide the most benefits to riparian/wetland habitat. Two designs of structures would be completed (brush or gravel). Up to five gravel structures could be engineered and constructed and up to 30 small brush structures could be constructed. E

channel stream reaches along the valley bottom would likely benefit most from these structures (i.e. Jones Creek reach 320, Bean Creek reach 300, Bear Creek reach 1645). All necessary clearances would be completed and best management practices would be followed in constructing the beaver mimicry structures. Other than the East Fork Peet Creek structures discussed in Alternative B, none of these beaver mimicry structures would be located within the Centennial Mountain WSA without additional NEPA documentation.

Figure 2.2 Historic Aspen Beaver Dams, July 2014



Noxious and Invasive Species

- Place signs at all trailheads with access to the Continental Divide Trail. These signs would inform users how to identify rush skeletonweed, why we are trying to stop its' establishment and who to call if they find any located along the trail.

Red Rock Allotment

- Conduct two cooperative spray days with Beaverhead County. One spray day would be at the beginning of the season (May/June) and one at the end (September/October).
- At the end of the second grazing season, areas in which the densest infestations of noxious weeds have occurred and native plant occurrence and diversity is lowest would be seeded with a competitive native seed mix. The following year in the grazing rotation is a rest year for the allotment which would allow the reseeded areas one full growing season to establish.

Rody Allotment

- Annually, treat the noxious weeds in this allotment two weeks before cattle are to be turned out.
- Reseed any areas where the weed infestations were large and dense enough that treatment of the noxious weeds results in little, if any, native vegetation remaining.

Travel Management

- Several route segments that were incorrectly mapped in the area around Lima Reservoir would be corrected. Routes that are accessible to the public from nearby county roads, and are currently being used by motor vehicles for recreational access would be designated open on future travel maps, and within the BLM designated routes database. Some roads that are not accessible were incorrectly shown as designated routes and would be shown as closed on future travel maps and within the BLM designated routes database. These routes are shown on Appendix A, Map #4.
- A route would be designated open in the area of Wolverine Creek where a prior public access easement across State Lands once provided access into the south end of the Gravelly Mountains. The route, which would restore public access, would be designed to reduce wetland impacts and minimize stream crossings. (See Appendix A, Map #4).
- Up to four stream crossings would be installed along the Fish Creek Road, a route designated open to public motorized vehicle use in an effort to improve public access and safety and reduce stream impacts including excessive sediment inputs.

Stream Crossings

- All applicable State and Federal Permits would be obtained and all permit conditions would be followed for construction of stream crossings.
- Culverts utilized to provide stream crossings would be adequately sized to maintain stream dimensions, patterns and profiles.

2.3.4 Description of Alternative B

Livestock Management

Livestock management changes are being proposed for six grazing allotments in which current and/or historic livestock use has been determined to be one of the causal factors in at least one Rangeland Health Standard not being met. These allotments are: Antelope Peak, Fish Creek Long Creek AMP, Morton Individual SGC, Red Rock and Rody Individual. In addition to the actions described above under 2.3.3, one or a combination of the following actions would be implemented: administrative changes, modification of grazing management plans, the construction or modification of range improvement projects, and/or the implementation of vegetative treatments.

This EA is also an opportunity to adjust grazing management plans on allotments that met all five Land Health Standards, but have livestock related impacts to localized areas. Two grazing allotments are in this category: Peet Creek and Shambo Units.

The Brundage Creek, Cocanougher Individual, Lousy Springs and McCandless Brothers grazing allotments met all five Land Health Standards during the 2014 assessment. However, in response to the BLM's scoping request for input by all affected parties, the grazing permittees for these allotments have requested the BLM to consider administrative changes, adjustment to the authorized season of use or completion of structural projects. Changes for these four allotments are proposed under Alternative B.

Please refer to the allotment maps 3, and 5-10 in Appendix A to see the location and extent of the proposed rangeland improvement projects and applicable administrative changes.

Antelope Peak #20179 (map #5)*Grazing Management:*

- No livestock grazing would be authorized in the riparian enclosure.
- The 10 AUMs located in the riparian enclosure would be removed from the grazing permit. The grazing rotation would remain unchanged from the No action alternative.

Projects:

- Construct a riparian enclosure fence around wetland #1750 in the Poor Farm pasture (approximately 10 acres).

Table 2.3 Current Terms and Conditions for Antelope Peak Allotments.

Allotment/ Category	Begin Date	End Date	Percent Public Land	Active AUMs
Antelope Peak	06/01	11/30	36	567

Table 2.4 Proposed Terms and Conditions for Antelope Peak Allotments.

Allotment/ Category	Begin Date	End Date	Percent Public Land	Active AUMs
Antelope Peak	06/01	11/30	42	557

Brundage Creek #20708*Administrative:*

- There are two pastures in the Brundage Creek Allotment (East and West). The base private property for the allotment has been divided between two separate entities (Stibal Ranch and Charles Stibal LLC). As a result, the east pasture would be grazed by the current permittee (Stibal Ranch LLC) and would continue to be called the Brundage Creek allotment with 419 active AUMs. The west pasture's grazing AUMs would be offered to Charles Stibal Ranch LLC. A new allotment called Brundage Spring would be created that would include 493 AUMs originally located in the Brundage Creek Allotment.

Table 2.5 Current Terms and Conditions for Brundage Creek Allotment.

Allotment/ Category	Begin Date	End Date	Percent Public Land	Active AUMs
Brundage Creek	06/01	11/30	85	912

Table 2.6 Proposed Terms and Conditions for Brundage Creek Allotment.

Allotment/ Category	Begin Date	End Date	Percent Public Land	Active AUMs
Brundage Creek	06/01	11/30	85	419

Table 2.7 Proposed Terms and Conditions for Brundage Spring Allotment.

Allotment/ Category	Begin Date	End Date	Percent Public Land	Active AUMs
Brundage Spring	06/01	11/30	75	493

Cocanougher Individual #10738 (map #7)

Grazing Management:

- This allotment has two pastures: BLM riparian pasture and the South pasture.
- The period of use in the BLM riparian pasture would be for 15 days every other year after September 1st. The riparian pasture could be grazed for a maximum of two years (not consecutive) in the early summer (June/July) in a 10-year period. If riparian is grazed in early summer it would not be grazed that fall.
- The current grazing permittee would have the option to accept a grazing permit from the BLM to graze livestock in the riparian pasture if he agrees to maintain the riparian fence that surrounds the pasture.
- Grazing in the South pasture would be the same as the No Action alternative.

Projects:

- The existing riparian pasture fence (east side) would be moved to follow the BLM/private land boundary where needed.

Table 2.8 Current Terms and Conditions for Cocanougher Allotment.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs
Cocanougher-C	4/25	10/30	100	10

Table 2.9 Proposed Terms and Conditions for the Riparian Pasture in the Cocanougher Allotment, Alternative B.

Allotment/Category	YEAR	Begin Date	End Date	Percent Public Land	Active AUMs
Cocanougher-C	Year 1	9/01	10/31	100	40
	Year 2	Rest	Rest		0
	Repeat Rotation				

Under Alternative B, the permittee would have the option to graze for 15 days during the period of June 1 to July 31 two years of out the next 10. If permittee grazes riparian pasture in June and/or July, no grazing would occur that fall.

Table 2.10 Proposed Terms and Conditions for the South Pasture in the Cocanougher Allotment, Alternative B.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs
Cocanougher-C	4/25	10/30	100	10

Fish Creek #20172 (map #6)

Grazing Management:

- Both the east and west pastures of Fish creek allotment would receive growing season rest every other year.
- Maximum grazing for each BLM pasture when grazed in the spring is 32 days. The spring grazing period is June 13 to July 16.
- Authorized grazing in the fall pasture would be reduced from 23 to 18 days. The fall grazing period is September 30 to October 18.
- Use in the riparian pasture would be for up to five days in spring (June 13 to July 16) every other year.

- Kind and number of livestock would be 568 cattle.

Projects:

- Build about two miles of fence around reaches 314 and 315 to create a riparian pasture. This pasture would be rested every other year.

Table 2.11 Grazing Rotation for Fish Creek.

Year	Riparian Pasture	West	East	BLM AUMs
1	5 days in spring (47 AUMS)	18 days in fall 168 AUMs	27 days in spring 252 AUMs	467
2	Rest	32 days in spring 299 AUMs	18 days in fall 168 AUMs	467
Repeat Rotation				

Table 2.12 Current Terms and Conditions for Fish Creek Allotment.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs
Fish Creek I	06/13	7/02	50	148
	7/03	7/16		101
	9/30	10/22		265

Total AUMs for the allotment is 514.

Table 2.13 Proposed Terms and Conditions for Fish Creek Allotment.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs	Total AUMs
Fish Creek I	06/13	7/16	50	299	467
	9/30	10/18		168	

Total AUMs for the allotment is 467.

Long Creek AMP #20154 (map #8)

Grazing Management:

- The duration of livestock grazing use would be reduced in the West Creek Pasture from 45 days to 30 days of livestock grazing and riding livestock out of riparian areas would be required.
- Authorized livestock use in the West Creek pasture would be reduced from 400 AUMs to 265 AUMs.
- One of the three pastures (West Creek, West Long and East Creek) would receive complete rest every year.

Projects:

- A culvert would be placed on Reach #1600 where the road crosses the creek.
- BLM would develop water from West Creek or a nearby spring to provide on off-site 1,000g livestock watering trough in T13S, R4W, Section 6.

Table 2.14 Current Terms and Conditions for Long Creek AMP.

Allotment/Category	Pastures	Grazing Period Length	Authorized Grazing Period	Percent Public Land	Active AUMs
Long Creek AMP, I	West Creek	45 Max Days	May 1 to December 15	100	400
	West Long	45 Max Days	May 1 to December 15		500
	East Long	45 Max Days	May 1 to December 15		445

*Total AUMs on the grazing permit would be 1345.

Table 2.15 Proposed Terms and Conditions for Long Creek AMP Allotment, Alternative B.

Allotment/Category	Pastures	Grazing Period Length	Authorized Grazing Period	Percent Public Land	Active AUMs
Long Creek AMP, I	West Creek	30 Max Days	July 1 to December 15	100	265
	West Long	45 Max Days	July 1 to December 15		500
	East Long	45 Max Days	July 1 to December 15		445

*Total AUMs on the grazing permit would be 1210.

Lousy Springs #00763 (map #1)

Administrative:

- The base private property for this allotment has changed parties. As a result, grazing preference for the allotment would be offered to the Charles Stibal Ranch LLC.

Table 2.16 Current Terms and Conditions for Lousy Springs Allotment, Alternative B.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs
Lousy Springs-C	5/01	11/30	100	110

McCandless Brothers SGC, 20185 (Map #9)

Grazing Management:

- The allotment would be rested at least every other year.

Administrative:

- The McCandless Brothers SGC would add two additional tracts of land to the allotment with an additional 10 AUMs. Both tracts are 40 acres in size and located in the SE of the SE ¼ of section 8 and the SW of the SW ¼ of Section 20 T14S, R1E. Both of these tracts were previously unallotted but have been fenced inside the refuge boundary for the last 10+ years. Both 40 acre tracts met all BLM’s Rangeland Health standards.
- The McCandless Brothers SGC would be changed to a Resource Reserve allotment. No BLM grazing permittee would be assigned to this allotment. The USFWS Red Rock Refuge would have the lead in managing this allotment through a MOU with the BLM. The Red Rock Refuge would coordinate with the BLM annually regarding livestock grazing use within the allotment.

Table 2.17 Current Terms and Conditions for McCandless Brothers SGC Allotment.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs
McCandless Brothers SGC, (C)	06/01	10/31	100	10

Table 2.18 Proposed Terms and Conditions for McCandless Brothers SGC Allotment.

Allotment/Category	Year	Begin Date	End Date	Percent Public Land	Active AUMs
McCandless Brothers SGC, (C)	Year 1	06/01	10/31	100	20
	Year 2	Rest			0

Use would be on a temporary non-renewable use basis.

Morton Individual SGC #20163 (map #9)

Grazing Management:

- The allotment would be grazed for a maximum of 15 days for the authorized AUMs during odd years and rested the entire grazing season during even years.

Projects:

- Construct 2.0 miles of fence along the BLM/private land boundary.

Table 2.19 Current Terms and Conditions for Morton Individual SGC Allotment.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs
Morton Individual SGC - C	05/15	11/14	100	11

Table 2.20 Proposed Terms and Conditions for Morton Individual SGC Allotment, Alternative B.

Allotment/Custodial	Year	Begin Date	End Date	Public Public Land	Active AUMs
Morton Individual SGC - C	Year 1	6/01	11/15	100	11
	Year 2	REST			0

Peet Creek #10730 (map #3)

Grazing Management:

- The allotment consists of three pastures (Lower East, Lower West and Upper).
- Grazing would not begin until July 1st.
- Upper Pasture would be rested once every third year with riding during grazing years.

Projects:

- Construct 1.0 miles of fence along the BLM/state land boundary.
- Construct in-stream sediment traps such as beaver dam mimicry structures to reduce sediment levels originating from channel erosion in an area of old beaver ponds in East

Fork Peet Creek. Construction of the structures would consist of using locally collected material. Hand tools would be used to drive wooden stakes into the stream channel. Smaller diameter willow shoots would then be woven through the stakes to form a “wicker” type weir.

Table 2.21 Current Terms and Conditions for Peet Creek Allotment.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs
Peet Creek /I	05/15	11/14	30	231

Table 2.22 Proposed Terms and Conditions for Peet Creek Allotment, Alternative B.

Allotment/Category	Year	Begin Date	End Date	Percent Public Land	Active AUMs
Peet Creek/I	1	07/01	11/14	30	231
	2	07/01	11/14		231
	3 (no graze upper pasture)	07/01	11/14		75
	Repeat Schedule				

Red Rock #30636 (map #10)

Grazing Management

- There are two pastures in this allotment: Red Rock and Upper pasture.
- The BLM administered land south of Lima Reservoir Road (Red Rock pasture) would be rested once every third year. Use in the Upper Pasture would remain custodial use.
- The number of authorized days in the Red Rock pasture would not exceed 15 day annually.
- There are 56 BLM AUMs authorized for the Red Rock pasture and 30 AUMs for the Upper pasture.
- No grazing before June 1st on allotment.

Table 2.23 Grazing Management for the Red Rock Pasture, Alternative B.

Allotment/Category	Year	Begin Date	End Date	Active AUMs
Red Rock	1	6/1	6/14	56
	2	8/10	8/24	56
	3	Rest	Rest	0

Projects:

- Rebuild/repair the west boundary fence (about 400 yards) of the Red Rock pasture between BLM and private lands.
- Remove the dysfunctional interior fence on the north side of the Red Rock pasture.
- Install a cattle guard on the northwest corner of the allotment to prevent unauthorized livestock from entering the allotment.
- Rebuild the fence on the south side of the allotment (about 1 mile of fence).

Table 2.24 Current Terms and Conditions for Red Rock Allotment.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs
Red Rock M	4/01	11/30	100	86

Table 2.25 Proposed Terms and Conditions for Red Rock Allotment, Alternative B.

Allotment/Category	Year	Begin Date	End Date	Percent Public Land	Active AUMs
Red Rock M	1	6/01	2/28	100	86
	2	6/01	2/28		86
	3 (no graze Red Rock Pasture)	6/01	2/28		30
	Repeat Rotation				

Rody Individual #20685 (map #10)

Grazing Management:

- The allotment would be grazed for no more than 60 days each year during the period of 7/01 to 10/30.

Projects:

- Reconstruct about one mile of the allotment boundary fence.

Table 2.26 Current Terms and Conditions for Rody Individual Allotment.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs
Rody Individual C	05/15	11/01	100	31

Table 2.27 Proposed Terms and Conditions for Rody Individual Allotment, Alternative B.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs
Rody Individual C	07/01	11/01	100	31

Shambo Units #20152 (map #3)

Grazing Management:

- Rest two of the three pastures each year.
- Graze one pasture each year.
- For the pasture being grazed, reduce authorized use period from 120 to 100 days.

Projects:

- Slightly change the placement of the allotment boundary fence in T14S, R3W, section 35 to follow the ridge rather than its current location where snow load tears it down annually.

Administrative:

- If the fence in Section 35 is re-aligned as described above, 29 acres of BLM administered land and an associated 5 AUMs would be excluded from the Shambo Units allotment and included in the adjacent landowner’s private land pasture. These 29 acres BLM administered acres including 5 AUMs may then be offered to the adjacent permittee for grazing use and a term grazing permit for custodial use could be issued to him.

Table 2.28 Current and Proposed Terms and Conditions for Shambo Units Allotment.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs
Shambo Units I	07/10	11/30	69	1146

Forest and Woodland Treatments

Commercial Harvest.

Alternative B would allow thinning of high density conifer stands, harvest of conifers in and around aspen stands, salvage harvest of dead/dying timber, sanitation harvest of live trees, and opportunities for commercial removal of biomass. Non-commercial mechanical treatments and/or prescribed fire would also be allowed to reduce residual slash after harvest activities, promote aspen, and reduce conifer expansion into aspen, sagebrush, and grassland.

Table 2.29 outlines the proposed treatment names, acres, objectives, miles of temporary road, number of crossings and the affected allotments under Alternative B. Treatment areas are shown on Appendix A, Map 2.

Table 2.29 Forest and Woodland Treatments, Alternative B.

Unit Name	Allotment(s)	Acres	Objective(s)	Miles of Temporary Road	Crossings
Amelia Creek	Unallotted	268	Restore historic conifer stand composition, structure and density; increase residual tree vigor; increase stand resiliency to future insect/disease; aspen restoration/promotion; salvage dead/dying timber.	2.0	2
Corral West	Price Creek	103		0.5	--
Lone Butte	Fish Creek	77		1.5	--
Totals		448		4.0	2.0

Also see section 2.3.3, Features Common to all action Alternatives for additional design features.

Up to 448 acres are proposed for commercial harvest under Alternative B. The silvicultural prescription in mixed conifer and Douglas-fir stands would focus on thinning green trees across all diameters < 32” DBH, leaving those with healthy crowns and minimal budworm damage, to create a residual stand with an average basal area of 60ft²/acre, with a range from 20-100ft²/acre. The goal would be to restore historic forest structure, creating stands more resilient to future drought, insects and disease, and wildfire. Where spruce is dominant, spruce trees may be harvested in irregularly shaped patches, creating small openings and group reserve areas. The

silvicultural prescription in commercial harvest units affected by current or past insect and disease activity would focus on the salvage harvest of dead and dying trees, removing up to 90% of dead trees. Up to 100% of green trees with evidence of successful beetle attack would also be harvested and removed.

Where viable aspen stands exist (defined as five or more live stems greater than 1" DBH and/or greater than 5' tall within a one hundred foot radius), all merchantable size conifers < 32" DBH within one hundred feet from the edge of the aspen stand would be cut. Where possible, non-merchantable conifers within the same areas would be cut and left on-site as a browse barrier.

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

Up to four miles of temporary road construction would be required under Alternative B. Up to two crossings may be required within the Amelia Creek commercial harvest unit, depending on the logging method and road access negotiations with the RRLNWR and/or adjacent private landowners.

The northeastern boundary of the Corral West commercial harvest unit is the existing road that parallels the East Fork of Corral Creek. One portion of the existing road, approximately 250 yards in length, is within the riparian area and is not suitable for hauling. To reduce the potential for sediment input to the creek, this unsuitable portion of the existing road would be physically closed to all motorized vehicles and a permanent re-route would be constructed upslope, away from the riparian area. Other portions of the existing road may require blading and/or upgrades to ensure adequate drainage and the safe passage of vehicles. Blading and/or upgrades of existing road are not considered new road construction. The East Fork of Corral Creek road is currently not a designated open route available to the public, and it will remain so post-harvest treatment.

Non Commercial Mechanical/Prescribed Fire Treatments

Up to 5,182 acres of non-commercial mechanical/prescribed fire treatment is proposed under Alternative B. The treatment units are shown on Table 2.30. Conifer expansion treatments utilizing mechanical methods and/or prescribed fire would focus on areas where conifers have most noticeably expanded into sagebrush/grassland compared to historic aerial photographs and field reconnaissance. The primary goal would be to kill/remove 60% or more of conifers less than 30 feet tall. Treatment methods would be a combination of cutting (lop and scatter) and/or prescribed fire. Actual prescribed fire treatment boundaries within the units identified on Appendix A, map 2 would be based on topographic features such as ridges and drainages, and man-made features such as trails and roads. When using prescribed fire to reduce conifer expansion into sagebrush habitat, an emphasis would be placed on maintaining 50% or more of the mature sagebrush canopy cover on a drainage (HUC 6) basis.

Figure 2.3 Conifer expansion - Corral West unit, July 2014



Other treatments proposed under Alternative B include maintenance burns within existing harvested timber units. In these units prescribed fire would be used to maintain the Douglas-fir savannah, reduce residual jackpot fuels, and promote aspen regeneration. Identified aspen units would use a combination of mechanical and prescribed fire to kill and/or remove competing conifers from existing aspen stands and promote suckering through fire as a disturbance agent. Acreages by treatment type are shown below in Table 2.30.

Table 2.30 Non-Commercial Mechanical/Prescribed Fire Treatments, Alternative B.				
Unit Name	Allotment	Acres	Objective(s)	Treatment Type(s)
Corral West	Price Creek	262	Reduce conifer expansion into sagebrush/grassland	Non-commercial mechanical/Broadcast Rx fire
PC1A	Price Creek	47	Maintain Douglas-fir savannah	
PC1B	Price Creek	229	Maintain Douglas-fir savannah	
PC2A	Price Creek	257	Maintain Douglas-fir savannah	
PC2B	Price Creek	100	Maintain Douglas-fir savannah	
PC3A	Price Creek	23	Maintain Douglas-fir savannah	
PC3B	Price Creek	75	Maintain Douglas-fir savannah	

Table 2.30 Non-Commercial Mechanical/Prescribed Fire Treatments, Alternative B.				
Unit Name	Allotment	Acres	Objective(s)	Treatment Type(s)
Price West	Price Creek	248	Reduce conifer expansion/ promote aspen regeneration	
Price East	Price Creek and Peet Creek	1010	Reduce conifer expansion/ promote aspen regeneration	
Peet West	Peet Creek	676	Reduce conifer expansion/ promote aspen regeneration	
Peet East	Peet Creek	412	Reduce conifer expansion/ promote aspen regeneration	
BC1	Shambo Units	43	Maintain Douglas-fir savannah	
Bean	Peet Creek	534	Reduce conifer expansion in existing parks, Promote 5 needle pine regeneration	
Bear North	Shambo Units	454	Reduce conifer expansion/ promote aspen regeneration	
Bear South	Shambo Units	835	Reduce conifer expansion in existing parks, Promote 5 needle pine regeneration	
TOTAL		5,205		

Travel Management

The route known as Corral Creek Road in the east end of the valley near Nemesis Mountain would be reopened to public motorized recreational vehicles as far as the Corral Creek crossing about 1.0 miles (See Appendix A, Map #4). The gate would be removed at the point of the current road closure and the easement from the adjacent private landowner that provided for public vehicle parking would be abandoned.

- The trail known as the Blair Lake Loop Trail would be added to the list of maintained trails within the Centennial Mountains. This trail was once identified as part of the Continental Divide National Scenic Trail (CDT), but the CDT designation has since been relocated and maintained to a higher standard. The Blair Lake Loop Trail would continue to receive a lower level of maintenance than the currently designated CDT, but would be maintained to a minimal level to preserve the loop trail opportunity.
- Install a boat ramp and short access road from the county road on the north side of the valley to Lima Reservoir (See Appendix A, Map #4).

2.3.5 Description of Alternative C

Livestock Management

There are some proposed administrative, grazing management and project features listed under alternative C that are carried over from alternative B. Please, refer to Table 2.46, *Comparison of Proposed Livestock Grazing or Administrative Alternatives by Allotment*, to compare specific proposals under alternatives A, B and C.

Cocanougher #10738 (map #7)

Grazing Management:

- The allotment would be managed as two separate pastures: the Riparian and South pasture.
- The south pasture’s grazing management would be the same as the no action alternative.
- The Riparian pasture would be grazed every year for up to 21 days during the authorized season.
- The permittee would be allowed to graze two separate years in ten during the spring (June 1 to July 15). If the riparian pasture is grazed in the spring it would not be grazed again that season.
- After three years of fall grazing, the BLM IDT would visit the riparian pasture to evaluate if the riparian pasture is meeting rangeland health standards or if rest needs to be incorporated into the grazing system to continue to meet the riparian health standard.

Table 2.31 Current Terms and Conditions for Cocanougher Riparian Pasture.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs
Cocanougher-C	No Grazing	No Grazing	100	0

Table 2.32 Proposed Terms and Conditions for Cocanougher Riparian Pasture, Alternative C.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs
Cocanougher-C	06/01	10/30	100	40

Table 2.33 Current Terms and Conditions for Cocanougher South Pasture.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs
Cocanougher-C	04/25	10/30	100	10

Table 2.34 Proposed Terms and Conditions for Cocanougher South Pasture, Alternative C.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs
Cocanougher-C	04/25	10/30	100	10

Fish Creek #20172 (map #6)

The allotment has no interior fences but riding and water availability divides the allotment into an East and West Pasture.

Grazing Management:

- Create a third pasture called the Northwest pasture. This new Northwest pasture would receive full rest every other year.
- The newly created riparian pasture would also be receiving full season rest every other year.
- The east pasture of Fish Creek allotment would receive growing season rest every other year.
- Maximum grazing for northwest and east pasture with BLM administered lands when grazed in the spring is <35 days.
- Authorized grazing in the fall use pasture would be reduced from 23 to 18 days.

Projects:

- Build about two miles of fence around reaches 314 and 315 to create a riparian pasture.
- Build a 2.0 mile fence to create a second pasture in the northwest portion of the allotment called the northwest pasture.

Table 2.35 Grazing Rotation for Fish Creek, Alternative C.

Year	Riparian Pasture	Northwest	East	Total BLM AUMs
1	5 days in spring (40 AUMs)	Rest	27 days in spring 209 AUMs	249
2	Rest	32 days in spring (209 AUMs)	18 days in fall (258 AUMs)	467
Repeat Rotation				

Table 2.36 Current Terms and Conditions for Fish Creek Allotment.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs	Total AUMs
Fish Creek I	06/13	7/02	50	148	514
	7/03	7/16		101	
	9/30	10/22		265	

Table 2.37 Proposed Terms and Conditions for Fish Creek Allotment - Year 1.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs	Total AUMs
Fish Creek I	06/13	7/16	50	249	249

Table 2.38 Proposed Terms and Conditions for Fish Creek Allotment - Year 2 (Year 3 repeat rotation).

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs	Total AUMs
Fish Creek I	06/13	7/16	50	209	467
	9/30	10/22		258	

Long Creek AMP #20154 (map #8)

Grazing Management:

- The West Creek Pasture would not be authorized for livestock grazing for the next 10 year grazing cycle.
- Active AUMs within the Long Creek AMP allotment would be reduced from 1345 to 945.
- The West Long and East Long Pastures management would be the same as the no action alternative.

Projects:

- Construct about one mile of fence along the BLM/private land boundary to eliminate livestock grazing on BLM administered lands.

Table 2.39 Current Terms and Conditions for Long Creek AMP Allotment.

Allotment/Category	Pastures	Grazing Period Length	Authorized Grazing Period	Percent Public Land	Active AUMs
Long Creek AMP, I	West Creek	45 Days	May 1 to December 15	55	1345
	West Long	45 Days	May 1 to December 15		
	East Long	45 Days	May 1 to December 15		

Table 2.40 Proposed Terms and Conditions for Long Creek AMP Allotment, Alternative C.

Allotment/Category	Pastures	Grazing Period Length	Authorized Grazing Period	Percent Public Land	Active AUMs
Long Creek AMP, I	West Creek	No Grazing	No Grazing	45	945
	West Long	45 Days	July 1 to December 15		
	East Long	45 Days	July 1 to December 15		

Morton Individual SGC #20163 (map #9)

Grazing Management:

- The allotment would be rested from livestock grazing for the next 10 years.

Projects:

- Same as alternative B.

Table 2.41 Current Terms and Conditions for Morton Individual SGC Allotment.

Allotment/Category	Begin Date	End Date	Percent Public Land	Active AUMs
Morton Individual SGC - C	05/15	11/14	100	11

Table 2.42 Proposed Terms and Conditions for Morton Individual SGC Allotment, Alternative C.

Allotment/ Custodial	Begin Date	End Date	Percent Public Land	Active AUMs
Morton Individual SGC - C	No Grazing	No Grazing	100	0

Red Rock #30636 (map #10)*Grazing Management*

- There are two pastures in this allotment: Red Rock and Upper pasture.
- The BLM administered land south of Lima Reservoir Road (Red Rock pasture) would be rested for the next 10 years.
- Use in the Upper Pasture would remain custodial use and management would be the same as the no action alternative.

Projects:

- Same as alternative B.

Table 2.43 Current Terms and Conditions for Red Rock Allotment.

Allotment/ Category	Begin Date	End Date	Percent Public Land	Active AUMs
Red Rock M	4/01	2/28	100	86

Table 2.44 Proposed Terms and Conditions for Red Rock Allotment, Alternative C.

Allotment/ Category	Begin Date	End Date	Percent Public Land	Active AUMs
Red Rock M (Upper Pasture only)	4/01	2/28	100	30

Forest and Woodland Treatments*Commercial Harvest*

Under Alternative C, the areas identified for forest and woodland treatments would be carried forward as proposed in Alternative B, and an additional treatment area is proposed. The silvicultural prescriptions, goals and stipulations identified in Alternative B would also apply to Alternative C. Alternative C would allow thinning of high density conifer stands, harvest of conifers in and around aspen stands, salvage harvest of dead/dying timber, sanitation harvest of live trees, and opportunities for commercial removal of biomass. Non-commercial mechanical treatments and/or prescribed fire would also be allowed to reduce residual slash after harvest activities, promote aspen, and reduce conifer expansion into aspen, sagebrush, and grasslands.

In addition to the forest and woodland treatments proposed in Alternative B, one additional harvest unit between Corral Creek (in Alaska Basin) and Antelope Creek would be proposed (See Appendix A, map #2). The AK Corral harvest unit would include up to 579 acres within the Morton Individual SGC and Tom Creek allotments and would require up to three miles of new temporary road, and up to two stream crossings. An existing road system is in place from

past commercial harvest activities; when possible, this road system would be utilized. Existing roads may require blading and/or upgrades to ensure adequate drainage and the safe passage of vehicles. Upgrades to existing roads are not considered new road construction, and the post-harvest designation of roads as open or closed routes is addressed in Travel Management found in sections 1.3, 2.3.1 and 2.3.3. Commercial harvest activity east of Corral Creek would be visible from the county road, and therefore noticeable to the casual observer. To address visual resource management considerations, harvest activity along the Corral Creek road would be limited to the commercial salvage of dead and/or dying trees within 100 feet of the Corral Creek road, until the Corral Creek stream crossing. Road access to BLM-managed land from adjacent private land would be pursued to reduce new temporary road construction and stream crossing requirements. Treatable acres are shown on Appendix A, Map #2.

Also see section 2.3.3, Features Common to all action Alternatives, and the Forest and Woodland Treatments Description section under Alternative B for additional design features.

Up to 1,027 acres are proposed for commercial harvest under Alternative C. Treatment areas proposed for commercial harvest under Alternative B (totaling 448 acres) are carried forward and included in the total acreage proposed for treatment under Alternative C.

Up to seven miles of temporary road construction would be required under Alternative C. The installation of up to four crossings would be required.

Non-Commercial Mechanical/Prescribed Fire Treatments

Treatments identified in Alternative C include all treatments from Alternative B plus the addition of the 3,645 acre Shambo treatment. The total acres proposed for treatments under alternative C would be up to 8,850 acres (See Table 2.45). Additional objectives for non-commercial mechanical/prescribed fire treatments identified in Alternative C include returning fire to the landscape as a disturbance agent to improve resiliency and increase seral diversity at the landscape level through the use of prescribed fire. Specifically in the Shambo unit this would be achieved through attaining measureable fire effects on at least 60% of the identified area. Measurable fire effects would include reductions in existing fuel loads (tons/acre), flame lengths, and fire line intensities, associated with a change in existing fuel models. Design features would remain the same as described in Alternative B. Treatments identified within wilderness study area boundaries would be confined to mainly broadcast fire with little or no mechanical modification to ensure protection and enhancement of wilderness characteristics. Treatments would occur in early spring or late fall to ensure existing fuels are readily available to support fire spread. Prescribed fire treatments proposed in Alternative C are summarized in the Table 2.45 below.

Unit Name	Allotment	Acres	Objective(s)	Treatment Type(s)
Shambo	Duff Creek	3645	Resiliency/ seral diversity	Non-commercial mechanical/Broadcast Rx fire
Corral West	Price Creek	262	Reduce conifer expansion into sagebrush/grassland	Non-commercial mechanical/Broadcast Rx fire
PC1A	Price Creek	47	Maintain Douglas-fir savannah	Non-commercial mechanical/Broadcast Rx fire
PC1B	Price Creek	229	Maintain Douglas-fir savannah	Non-commercial mechanical/Broadcast Rx fire
PC2A	Price Creek	257	Maintain Douglas-fir savannah	Non-commercial mechanical/Broadcast Rx fire
PC2B	Price Creek	100	Maintain Douglas-fir savannah	Non-commercial mechanical/Broadcast Rx fire
PC3A	Price Creek	23	Maintain Douglas-fir savannah	Non-commercial mechanical/Broadcast Rx fire
PC3B	Price Creek	75	Maintain Douglas-fir savannah	Non-commercial mechanical/Broadcast Rx fire
Price West	Price Creek	248	Reduce conifer expansion/ promote aspen regeneration	Non-commercial mechanical/Broadcast Rx fire
Price East	Price Creek/Peet Creek	1010	Reduce conifer expansion/ promote aspen regeneration	Non-commercial mechanical/Broadcast Rx fire
Peet West	Peet Creek	676	Reduce conifer expansion/ promote aspen regeneration	Non-commercial mechanical/Broadcast Rx fire

Unit Name	Allotment	Acres	Objective(s)	Treatment Type(s)
Peet East	Peet Creek	412	Reduce conifer expansion/ promote aspen regeneration	Non-commercial mechanical/Broadcast Rx fire
BC1	Shambo Units	43	Maintain Douglas-fir savannah	Non-commercial mechanical/Broadcast Rx fire
Bean	Shambo Units	534	Reduce conifer expansion in existing parks, Promote 5 needle pine regeneration	Non-commercial mechanical/Broadcast Rx fire
Bear North	Shambo Units	454	Reduce conifer expansion/ promote aspen regeneration	Non-commercial mechanical/Broadcast Rx fire
Bear South	Shambo Units	835	Reduce conifer expansion in existing parks, Promote 5 needle pine regeneration	Non-commercial mechanical/Broadcast Rx fire
TOTAL		8,850		

Travel Management

- The Corral Creek Road in the east end of the Centennial Valley would be reopened to the point of its original termination throughout the late 20th century. This would require the replacement of a bridge (or at least a large culvert) to cross Corral Creek, and would be closed by a fence, gate or other barrier at its terminus approximately within T. 14S, R. 1E, Section 21., about 1.2 miles from the current closure (See Appendix A, Map #4).

2.4 Summary Comparison of Alternative Actions

Nine of the twelve grazing allotments in the watershed have proposed grazing management changes. * - Seven of the twelve allotments do not have any actions proposed under Alternative C. See Table 2.46 below for comparison by alternative.

Table 2.46 Comparison of Proposed Livestock Grazing or Administrative Alternatives by Allotment.					
Antelope Peak #20179	Alternative A (No Action)	Alternative B		Alternative C	
Season of Use	06/01-11/30	06/01-11/30		*	
Active BLM AUMs	567	557		*	
Grazing System	Deferred Rotation	Deferred Rotation		*	
Projects	None	Construct Riparian Exclosure around wetland #1750		*	
Brundage Creek #20707	Alternative A (No Action)	Alternative B		Alternative C	
Season of Use	06/01-11/30	06/01-11/30		*	
Active BLM AUMs	912	419 (493 AUMs given to new Brundage Spring allotment)		*	
Grazing System	Custodial Use	Short-term Grazing		*	
Administrative Actions	None	The west pasture's grazing AUMs (493) would be offered to Charles Stibal Ranch LLC. Create a new allotment with acres and AUMs from West Pasture of Brundage Creek Allotment.		*	
Cocanougher #10738	Alternative A (No Action)	Alternative B	Alternative B	Alternative C	Alternative C
		Riparian Pasture	South pasture	Riparian Pasture	South pasture
Season of Use	4/25-10/31	06/01-10/31	4/25-10/31	06/01-10/31	4/25-10/31
Active BLM AUMs	10	40	10	40	10
Grazing System	Short Term Grazing	Rest every other year	Short-term Grazing	Short-term grazing	
Projects	None	Realign fence to follow BLM boundary		Same as alternative B	

Table 2.46 Comparison of Proposed Livestock Grazing or Administrative Alternatives by Allotment.					
Fish Creek #20172	Alternative A (No Action)	Alternative B	Alternative B	Alternative C	Alternative C
		Year 1	Year 2	Year 1	Year 2
Season of Use	6/13-10/22	6/13 to 7/16 And 9/30 to 10/18	6/13 to 7/16 And 9/30 to 10/18	6/13-7/16	6/13-7/16 And 9/30 to 10/22
Active BLM AUMs	514	467	467	249	467
Grazing System	Deferred Rotation	Rest Rotation (Maximum grazing period in fall is 18 days and 35 days in spring)		Rest Rotation	
Projects	None	Build two miles of fence to create Riparian Pasture		Build two mile of fence to create Riparian Pasture. Build two miles of fence to create Northwest pasture.	
Long Creek AMP #20154	Alternative A (No Action)	Alternative B		Alternative C	
Season of Use	5/1-12/15	6/1-12/15		No Grazing in West Pasture, Grazing from 7/1-12/15 in West Long and East Long Pastures	
Active BLM AUMs	1345	1210		945	
Grazing System	Deferred Rotation- Each Pasture grazed for < 45 days	Deferred Rotation- West Long and East Long grazed for <45 days, West Creek grazed for <30 days.		Deferred Rotation- West Long and East Long grazed for <45 days. No grazing in West Pasture.	
Projects	None	A culvert would be placed on reach #1600 where it crosses the road. Develop off-site water with 1,000g trough from West Creek or spring.		Construct about one mile of fence to eliminate livestock grazing on BLM administered lands in the West Pasture.	
Lousy Springs #00763	Alternative A (No Action)	Alternative B		Alternative C	
Season of Use	05/1-11/30	05/1-11/30		*	
Active BLM AUMs	110	110		*	
Grazing System	Short-term grazing	Short-term grazing		*	
Administrative Actions	None	Offer grazing preference for allotment to the Charles Stibal Ranch LLC		*	

Table 2.46 Comparison of Proposed Livestock Grazing or Administrative Alternatives by Allotment.			
McCandless Brothers SCG #20185	Alternative A (No Action)	Alternative B	Alternative C
Season of Use	06/01-10/31	06/01-10/31	*
Active BLM AUMs	10	20	*
Grazing System	Short Term Grazing	Short Term Grazing (Complete rest at least every other year)	*
Administrative Actions	None	Include two 40-acre unallotted tracts of land into the allotment. Make the allotment a Resource Reserve allotment where the permittee would be chosen annually based on need and in coordination with the National Red Rock Wildlife Refuge	*
Morton Individual SGC #20163	Alternative A (No Action)	Alternative B	Alternative C
Season of Use	5/15-11/14	6/01-11/15 (Grazing period ≤15 days every other year, rest every other year)	No Grazing for the Next 10 year period
Active BLM AUMs	11	11	0
Grazing System	Custodial Use	Short Term Grazing	No Grazing
Projects	None	Build 2.0 miles of fence to separate the BLM from the Private lands.	Same as Alternative B
Peet Creek #10730	Alternative A (No Action)	Alternative B	Alternative C
*Season of Use	5/15 – 11/14	7/1-11/14 (Rest Upper Pasture every third year)	*
Active BLM AUMs	231	231	*
Grazing System	Deferred Rotation	Deferred/Rest Rotation	*
Projects	None	Build 1.0 miles of fence to separate private from BLM.	*

Table 2.46 Comparison of Proposed Livestock Grazing or Administrative Alternatives by Allotment.			
Red Rock #30636	Alternative A (No Action)	Alternative B	Alternative C
*Season of Use	4/01-2/28	06/01-11/30 – grazing period in the Custodial Upper pasture (≤15 days grazing period in Red Rock Pasture); Rest Rock pasture once every third year	06/01-11/30- grazing period in the Custodial, Upper pasture. No grazing for the next 10 year period in the Red Rock Pasture.
Active BLM AUMs	86	86	30
Grazing System	Custodial Use	Custodial Upper Pasture; Rest rotation (short term) Red Rock Pasture	Custodial Upper Pasture; No grazing Red Rock Pasture
Projects	None	Build/Reconstruct fences to separate the BLM from the Private lands. Install a new cattle guard where fence would be rebuilt.	Same as alternative B.
Rody Individual #20685	Alternative A (No Action)	Alternative B	Alternative C
*Season of Use	5/15-11/01	07/01-11/01 (<60 Day grazing Period)	*
Active BLM AUMs	31	31	*
Grazing System	Custodial Use	Short Term Grazing	*
Projects	None	Rebuild boundary fence	*
Administrative Actions	None	None	*
Shambo Units #20152	Alternative A (No Action)	Alternative B	Alternative C
*Season of Use	7/10 to 11/30 (120 day grazing period)	7/10 to 11/30 (100 day grazing period)	*
Active BLM AUMs	1146	1146	*
Grazing System	Rest Rotation	Rest Rotation Rest each of three pastures two out of three years	*
Projects	None	Slightly alter location of boundary fence in T14S, R3W, Section 35. Install beaver mimicry structures to several streams in allotment. Plant willow and sedges in specific streams in allotment.	*

The grazing season and billing period for all BLM allotments begins on March 1 of the year and ends on February 28 the following calendar year. Accordingly, the number of AUMs harvested under Alternative B are calculated for each grazing season and billing cycle, and not based on a particular calendar year.

Table 2.47 Comparison of Forest and Woodland Treatments by Alternative.

Unit	Allotment(s)	Acres			Miles of Temporary Road			Crossings		
		Alt A	Alt B	Alt C	Alt A	Alt B	Alt C	Alt A	Alt B	Alt C
Amelia Creek	Unallotted	0	268	268	0	2.0	2.0	0	2	2
Corral West	Price Creek	0	103	103	0	0.5	0.5	0	--	--
Lone Butte	Long Creek/Fish Creek	0	77	77	0	1.5	1.5	0	--	--
AK Corral	Tom Creek/Morton Individual	0	0	579	0	0	3.0	0	0	2
TOTAL		0	448	1,027	0	4.0	7.0	0	2	4

Table 2.48 Comparison of Non-Commercial Mechanical/Prescribed Fire Treatment Units by Alternative.

Unit Name	Allotment	Alternative A	Alternative B Acres	Alternative C Acres
Corral West	Price Creek	0	262	262
PC1A	Price Creek	0	47	47
PC1B	Price Creek	0	229	229
PC2A	Price Creek	0	257	257
PC2B	Price Creek	0	100	100
PC3A	Price Creek	0	23	23
PC3B	Price Creek	0	75	75
Price West	Price Creek	0	248	248
Price East	Price Creek/Peet Creek	0	1010	1010
Peet West	Peet Creek	0	676	676
Peet East	Peet Creek	0	412	412
BC1	Shambo	0	43	43
Bean	Shambo	0	534	534
Bear North	Shambo	0	454	454
Bear South	Shambo	0	835	835
Shambo	Duff Creek	0	0	3635
TOTAL		0	5,205	8,850

Table 2.49 Comparison of Travel Management Actions by Alternative

Alternative A	Alternative B	Alternative C
<p>No change in the existing mileage of designated, open, or un-designated roads.</p>	<ul style="list-style-type: none"> - A total of 6.8 miles of designated open roads would be un-designated. - A total of 4.5 miles of undesignated roads would be designated open. - There would be a total reduction of 2.3 miles of roads designated open to wheeled motorized vehicles.(6.8-4.5=2.3). 	<ul style="list-style-type: none"> - A total of 6.8 miles of designated open roads would be un-designated. - A total of 5.8 miles of roads not currently designated open would be designated open to wheeled motorized vehicles. - There would be a total reduction of 1.0 mile of roads designated open to wheeled motorized vehicles (6.8-5.8=1.0).

Chapter 3

3.0 Affected Environment

This chapter describes the existing condition of specific environmental components that may be affected by the proposed action. The description of the affected environment is related to the specific issues and resource concerns identified in Chapter 1, but also encompasses the wider landscape of the Centennial Watershed. This chapter is a summary of the baseline environment. A more detailed and comprehensive description of the current conditions in the watershed is provided in the Centennial Watershed Assessment Report (January 23, 2015), which is incorporated by reference into this document, and is available for review at the Dillon Field Office or online at http://www.blm.gov/mt/st/en/fo/dillon_field_office.html.

3.1 General Setting

The Centennial Watershed is located in southeastern Beaverhead County, Montana on the eastern slopes of the Rocky Mountains. The assessment area covers public lands administered by the BLM from approximately Lima Dam on the west to Red Rock Pass on the east and from the continental divide along the Montana-Idaho border on the south to the Gravelly Range on the north. This area includes public lands within two hydrologic unit code (HUC) 5 boundaries covering the Centennial Valley. The assessment area boundary shown on Map A follows grazing allotment boundaries and includes some allotments that are partially within the watershed.

Within the Centennial Watershed Assessment boundary, there are approximately 347,543 acres of which the BLM administers 83,102 acres. This report addresses only public lands administered by the BLM within the watershed. However, approximately 59,832 acres administered by the State of Montana Department of Natural Resources (DNRC), 105,718 acres of privately owned lands, 39,231 acres of public land administered by the Red Rock Lakes National Wildlife Refuge, 15,538 acres administered by the USDA Agricultural Research Service (Sheep Experiment Station) and 44,122 acres administered by the US Forest Service (USFS) also occur within the watershed assessment area. Twenty four percent of the watershed, 83,107 acres, is public land administered by the BLM. The watershed encompasses 36 grazing allotments containing 74,610 acres of BLM land and 8,492 acres that is unallotted for livestock grazing. The unallotted acres are located within the Centennial Mountains WSA which includes a total of 27,691 acres.

In some locations the watershed border follows BLM grazing allotment boundaries and includes some allotments that are only partially within the watershed. Watersheds are defined, and designated on maps, by natural topographical boundaries (ridgelines/drainages). Grazing allotments boundaries have been determined by previous BLM decisions and land ownership. These administrative boundaries may not follow topographical features. Therefore, some of the grazing allotments in the assessment area fall within one or more hydrologic unit or watershed.

Present vegetation reflects the diversity of ecological conditions across the landscape. The dominant plant communities and habitat types change according to soils, precipitation, elevation,

slope and aspect. A wide variety of vegetation is found within the Centennial watershed, from wetland and riparian species dependent on water and moist soils to sagebrush and grassland communities that thrive on relatively dryer upland sites. Forested habitats cover the higher elevations. The watershed's diverse landscape and vegetation provides habitat and structural niches for a wide variety and abundance of wildlife.

3.2 Description of Affected Resources/Issues

3.2.1 Issue # 1: Riparian, Wetland and Aquatic Habitat

In Chapter 1 of this EA, the riparian, wetland and aquatic habitat objectives for the Centennial Watershed that are expected to be achieved over the ten year life of the EA were described. The goals and objectives for riparian and wetland condition are described in the Dillon RMP. The goal is to initiate an upward trend in 20 years; the objective is to move resource conditions forward toward reaching Desired Future Conditions (DFC) in 20 to 50 years. Streams that are achieving Proper Functioning Condition (PFC) are not necessarily at DFC, however, PFC is a prerequisite to achieving desired condition (USDI 1998).

The Centennial Mountains are the headwaters to numerous snowmelt derived streams. These streams support the largest wetland complex on public lands managed by the BLM in the Dillon Field Office. Flood irrigation diversion modifies hydrology, influences hydric soil formation and is responsible for extensive wetland expanses, mostly on private land, in Centennial Valley. Statewide irrigation, including flood irrigation, accounts for 68% of all consumptive water use (2015 Montana State Water Plan). Red Rock River, Lima Reservoir and Red Rock Lakes are the major surface water features in Centennial Valley. Red Rock River originates at the east end of the valley in Alaska Basin. A dominant hydrologic feature in Centennial Valley is Lima Reservoir formed by the construction of Lima Dam in 1893 (Giles et al 2006). The reservoir floods a portion of the Red Rock River and its historic floodplain. The operation of the dam results in an unstable environment for the establishment of shoreline wetlands.

Riparian/mesic shrubs make up 5% of the BLM administered lands in the CW. Riparian, aquatic, and wetland habitat offers habitat diversity and are crucial water sources for wildlife. Succulent forbs, largely found in riparian areas, are a key component of sage grouse brood diets. Wildlife and livestock concentrate in riparian habitat, as it provides green vegetation later into the summer and fall, resulting in a disproportionate amount of use in these areas. Most wildlife species utilize riparian habitat for at least some portion of their annual life cycle. Riparian areas provide important habitat for moose, elk, beaver and sage grouse brood rearing.

Beaver activity is evident by active and/or relic dams in most of the perennial streams in the watershed where suitable habitat exists. Beaver play a keystone role in creating and maintaining riparian habitat and associated wetlands and can have a profound effect on habitats that are essential to sustain migrant songbirds and amphibian populations. Beaver populations were historically much higher as evidenced by the number and size of breached beaver dams within the headwaters of the Red Rock River. The decline in aspen throughout the watershed has no doubt played an important role in the decline of beaver, as this was the primary material used in construction of the remnant dams. Many of these sites are now converted to conifer forest.

Aspen in the CW is also an important forage, cover, and nesting component for various species including elk, moose, and ruffed grouse. Riparian woodlands support the highest diversity of land bird species of all habitats. Riparian corridors are crucial to several northern-breeding Neotropical migrants and breeding or wintering species, even though they may not carry water year-round (Rich et al., 2004). Most migratory bird species are summer residents that use habitats ranging from lower elevation wetlands to high elevation forests for breeding and raising young. Some species are migratory, but small populations may stay yearlong depending on seasonal conditions.

Waterfowl numbers are found in upwards of 50,000 during spring and fall migrations in the Centennial Valley. The wetlands in the valley support $\frac{1}{3}$ to $\frac{1}{2}$ of the breeding population of trumpeter swans in the tri-state area of Idaho, Montana and Wyoming. The Red Rock River and associated wetlands also support one of the largest populations of molting Canada geese in the northern Rocky Mountains. The BLM partnered with Ducks Unlimited to construct three wetlands in the valley between 1999 and 2004. Maintaining sufficient water levels in these wetlands is vital to nesting and brooding for ducks, geese and Trumpeter swans.

High gradient mountain streams flow out of the Centennial Mountains, and as these streams enter the valley bottom their character changes. Often the streams from the Gravelly and the Centennial Mountains are diverted for irrigation. The low gradient valley streams and associated floodplains developed in glacial materials and are maintained by sediments transported from the mountain streams. Flows coming out of the Centennial Mountains have large seasonal variations. The largest flows generally occur during spring or early summer because of snow melt and rainstorms.

The Bureau of Land Management relies on the United States Fish and Wildlife Service and the Montana Natural Heritage Program for wetland inventory and mapping via the National Wetlands Inventory (NWI). The NWI has not been completed in Montana. Some wetland mapping work was done in the Centennial Valley in the 1980s and the United States Fish and Wildlife Service published Draft maps which have subsequently been digitized. The State of Montana established the Montana Wetland and Riparian Mapping Center in 2007 and has begun a mapping program. Many parts of Montana were never mapped and wetland mapping in the Centennial Valley will not be complete for some years. The 1980s Draft NWI mapping is the best available data and was used by the ID Team during the field assessment.

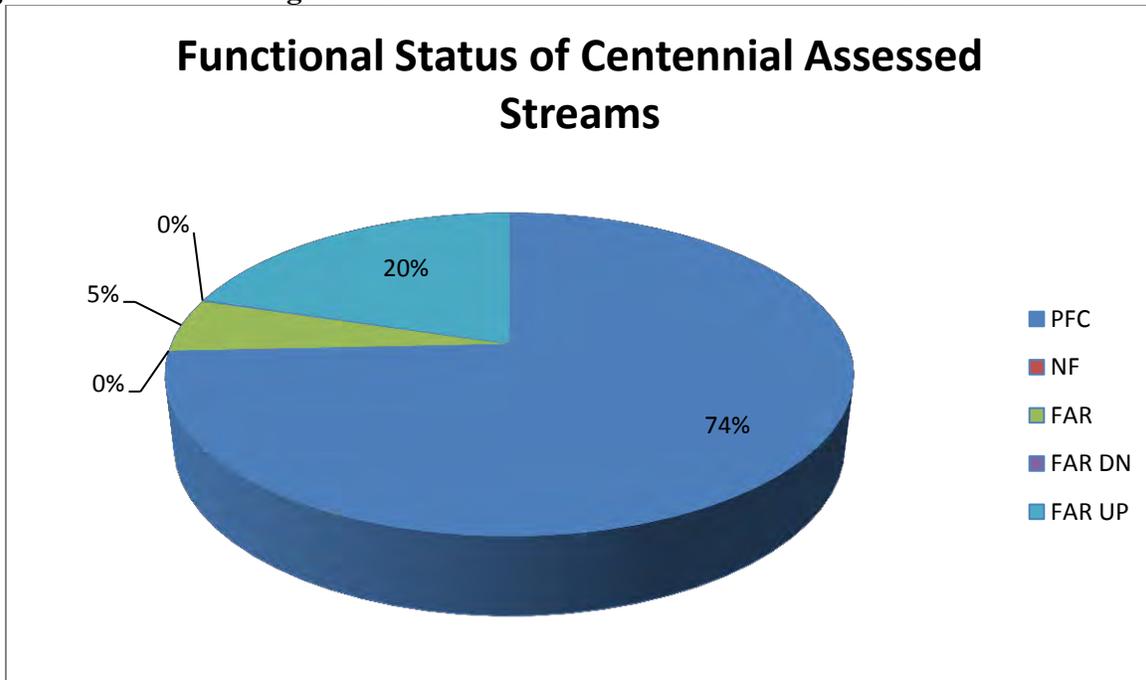
Centennial Valley contains vast wetland resources. Red Rock Lakes, which are located within the National Wildlife Refuge, are important to the hydrology of the valley. According to National Wetland Inventory (NWI) data, there are 47,526 acres of wetlands in Centennial Valley. Of those acres, 3,784 acres (8%) occur on public land administered by the BLM. Interpretation of the NWI data coverage in the valley indicates that wetlands are vigorous (intact hydrological functions, representative native plant communities, outstanding wildlife values, and/or rare plant and animal species) where there is sufficient water available. The IDT's findings support this data. Active beaver complexes are currently found on BLM administered lands within the Long Creek and Price Creek drainages.

Streams in CW assessment area drain 347,543 acres of Public, Forest Service, State and private land. Of the total acreage, 83,102 acres (24%) are administered by the BLM.

Some of the major streams within the Centennial Watershed are Tom, Hell Roaring, Corral, Duff, Bean, Bear, Curry, Clover, Fish, Jones, Long, Middle, West, Metzel, O’Dell, Peet, Price, Tipton, Winslow and Wolverine Creeks and the Red Rock River. The occurrence of public land throughout the valley and the assessment boundary is such that the BLM has limited management on Clover, Fish, Long, O’Dell, West, Wolverine Creek and the Red Rock River.

There are 137 miles of streams on BLM administered lands in the Centennial Watershed. Of those streams, 102 miles were rated PFC and 28 miles were rated FAR with an upward trend. Seven miles were rated FAR with a static or not apparent trend and one tenth of a mile was rated FAR with a downward trend. No reaches were rated NF.

Figure 3.1 The Percentage of Total Stream Miles in Each Functional Class.



As mentioned in Chapter 1, the Authorized Officer determined that livestock grazing impacts are contributing to riparian standards not being met in five grazing allotments: Antelope Peak, Fish Creek, Long Creek AMP, Morton Individual/SGC and Red Rock. Alternatives will also be analyzed for seven (Brundage Creek, Cocanougher, Lousy Springs, McCandless Brothers, Peet Creek, Rody Individual and Shambo Unit) allotments that either failed the upland standard or that met all of the Land Health Standards but had had site-specific resource concerns or the permittee has proposed management changes to facilitate more efficient or effective use.

Stream Name	Allotment	BLM Reach ID	Functional Rating & Trend	Miles
Red Rock River	7L SGC	1633	PFC	0.6
Red Rock River	Brundage Bridge	357	PFC	0.9
Red Rock River	Brundage Bridge	387	PFC	0.1
Brundage Creek	Brundage Creek	358	PFC	0.2
Brundage Creek	Brundage Creek	359	PFC	0.5
West Creek	Cocanougher Ind	386	PFC	0.3
Red Rock River	Cocanougher Ind	362	PFC	0.4
Hell Roaring Crk	Davis SGC	316	PFC	2.9
Curry Creek trib	Duff Creek	1622	PFC	1.2
Shambo Creek	Duff Creek	1614	PFC	2.3
Duff Creek	Duff Creek	1620	PFC	1.0
Duff Creek trib	Duff Creek	1619	PFC	0.5
Shambo Creek trib	Duff Creek	1616	PFC	1.5
Humphry Creek	Duff Creek	1618	PFC	2.4
Matsingale Creek	Duff Creek	1621	PFC	0.4
Metzel Creek	Fish Creek	315	FAR	1.7
Fish Creek	Fish Creek	312	PFC	1.5
Metzel Creek	Fish Creek	314	FAR	1.2
Fish Creek	Fish Creek	313	PFC	0.5
Long Creek trib	Fish Creek	2504	PFC	0.3
Fish Creek trib	Fish Creek	2508	PFC	0.8
Metzel Creek	Fish Creek	2509	PFC	0.3
Lima Reservoir trib	Lima Reservoir AMP	385	FAR Up	0.2
Lima Reservoir trib	Lima Reservoir AMP	382	FAR-Up	1.0
Lima Reservoir trib	Lima Reservoir AMP	383	FAR Up	0.6
Lima Reservoir trib	Lima Reservoir AMP	365	FAR-Up	0.6
Wolverine Creek	Lima Reservoir AMP	364	FAR-Up	0.7
Long Creek	Long Creek AMP	338	PFC	2.6
Long Creek	Long Creek AMP	1604	PFC	0.3
Middle Creek	Long Creek AMP	339	FAR-Up	0.6
West Creek	Long Creek AMP	378	FAR	1.0
Long Creek trib	Long Creek AMP	335	PFC	0.6

Stream Name	Allotment	BLM Reach ID	Functional Rating & Trend	Miles
Wolverine Crk trib	Long Creek AMP	1600	FAR	0.2
Long Creek trib	Long Creek AMP	336	PFC	0.6
Mohican Crk trib	Long Creek AMP	341	PFC	0.9
Mohican Creek	Long Creek AMP	340	FAR-Up	0.8
Piute Creek	Long Creek AMP	347	PFC	1.1
Crow Creek	Long Creek AMP	309	PFC	1.1
Long Creek trib	Long Creek AMP	334	PFC	0.3
Long Creek trib	Long Creek AMP	1606	PFC	0.5
Long Creek trib	Long Creek AMP	333	PFC	1.0
Long Creek trib	Long Creek AMP	1607	PFC	0.8
Long Creek trib	Long Creek AMP	337	PFC	0.6
Lima Reservoir trib	Monida Hill	322	PFC	0.9
Lima Reservoir trib	Monida Hill	331	PFC	0.4
Corral Creek trib	Morton Individual	1608	FAR-Dn	0.1
Corral Creek, EF	Morton Individual	303	PFC	0.6
Red Rock River	Oxbow	368	FAR-Up	0.3
Red Rock River	Oxbow	361	PFC	1.7
Red Rock River	Oxbow	389	PFC	0.3
Red Rock River	Oxbow	390	FAR-Up	0.5
Red Rock River	Oxbow	363	PFC	0.5
Red Rock River	Oxbow	391	PFC	1.5
Red Rock River	Oxbow	392	FAR-Up	0.8
Red Rock River	Oxbow	393	FAR-Up	0.2
Red Rock River	Oxbow	394	FAR-Up	1.3
Peet Creek	Oxbow	1658	FAR-Up	0.3
Bean Creek trib	Passmore	320	FAR-Up	0.4
Peet Creek	Peet Creek	346	PFC	0.9
Peet Creek	Peet Creek	343	PFC	0.6
Peet Creek, EF	Peet Creek	1652	PFC	0.2
Peet Creek, EF	Peet Creek	1653	FAR	0.7
Peet Creek trib	Peet Creek	344	PFC	0.9
Peet Creek, EF	Peet Creek	1654	PFC	1.2
Peet Creek	Peet Creek	345	PFC	0.7
Peet Creek	Peet Creek	1655	PFC	0.8

Stream Name	Allotment	BLM Reach ID	Functional Rating & Trend	Miles
Peet Creek trib	Peet Creek	1656	PFC	0.9
Peet Creek trib	Peet Creek	1657	PFC	1.9
Bean Creek, WF	Peet Creek	1649	PFC	0.6
Sand Creek trib	Price Creek	373	PFC	0.5
Price Creek trib	Price Creek	306	FAR-Up	0.3
Price Creek	Price Creek	1674	PFC	1.1
Price Creek, WF	Price Creek	350	PFC	1.1
Peet Creek, WF	Price Creek	1665	FAR-Up	0.8
Sand Creek trib	Price Creek	371	FAR-Up	1.1
Sand Creek	Price Creek	370	FAR-Up	1.5
Sand Creek	Price Creek	1683	FAR-Up	0.4
Price Creek trib	Price Creek	1675	PFC	0.6
Corral Crk, WF trib	Price Creek	308	PFC	0.2
Price Creek, EF	Price Creek	355	PFC	1.0
Price Creek, EF trib	Price Creek	1668	PFC	0.9
Price Creek, EF trib	Price Creek	1667	PFC	0.1
Price Creek, EF	Price Creek	353	PFC	1.1
Price Creek, EF trib	Price Creek	1669	PFC	1.5
Price Creek	Price Creek	354	PFC	1.3
Price Creek trib	Price Creek	1671	PFC	0.6
Price Creek	Price Creek	356	PFC	0.9
Sand Creek	Price Creek	367	FAR-Up	1.7
Price Creek	Price Creek	1681	PFC	1.1
Sand Creek	Price Creek	1693	FAR-Up	0.6
Sand Creek	Price Creek	1686	FAR-Up	0.6
Sand Creek	Price Creek	368	FAR-Up	1.4
Sand Creek	Price Creek	1688	FAR-Up	0.4
Sand Creek	Price Creek	369	FAR-Up	0.5
Sand Creek trib	Price Creek	1685	FAR-Up	0.4
Sand Creek trib	Price Creek	372	PFC	0.8
Sand Crk, WF trib	Price Creek	376	PFC	0.7
Sand Creek, WF	Price Creek	374	FAR-Up	1.2
Sand Creek, trib	Price Creek	375	PFC	0.4
Corral Creek, EF	Price Creek	305	PFC	1.0

Stream Name	Allotment	BLM Reach ID	Functional Rating & Trend	Miles
Peet Creek, springbrook	Price Creek	1659	FAR-Up	1.2
Price Creek	Price Creek	352	PFC	0.9
Peet Creek, WF	Price Creek	1664	PFC	1.5
Price Creek trib	Price Creek	1676	PFC	1.1
Peet Creek, WF	Price Creek	1660	FAR-Up	1.6
Price Creek, WF	Price Creek	351	PFC	0.4
Price Creek, WF	Price Creek	1677	PFC	1.2
Peet Creek, WF	Price Creek	1661	FAR-Up	0.5
Price Crk, WF trib	Price Creek	1678	PFC	0.3
Peet Creek, WF	Price Creek	1662	FAR-Up	1.1
Corral Crk, WF trib	Price Creek	1695	PFC	0.2
Price Creek, WF	Price Creek	348	PFC	0.8
Price Creek, WF	Price Creek	1679	PFC	0.5
Price Creek, WF	Price Creek	1672	PFC	0.7
Price Creek, EF trib	Price Creek	1670	PFC	0.4
Corral Creek, WF	Price Creek	307	PFC	1.2
Price Creek WF	Price Creek	349	PFC	0.4
Red Rock River	Red Rock	380	FAR	0.9
Curry Creek	Shambo Unit	1625	FAR-Up	0.7
Curry Creek trib	Shambo Unit	310	PFC	2.3
Red Rock River trib	Shambo Unit	1628	PFC	0.2
Bean Creek, EF	Shambo Unit	302	PFC	1.5
Winslow Creek	Shambo Unit	379	PFC	1.5
Winslow Creek	Shambo Unit	1634	FAR-Up	0.7
Jones Creek	Shambo Unit	1638	PFC	1.5
Winslow Creek trib	Shambo Unit	1635	FAR-Up	2.3
Curry Creek	Shambo Unit	311	PFC	0.1
Bear Creek	Shambo Unit	1645	PFC	0.3
Bear Creek	Shambo Unit	1646	PFC	2.1
Curry Creek trib	Shambo Unit	1627	FAR-Up	1.1
Jones Creek trib	Shambo Unit	319	PFC	0.6
Jones Creek trib	Shambo Unit	1637	PFC	0.2
Jones Creek trib	Shambo Unit	318	PFC	1.0

Stream Name	Allotment	BLM Reach ID	Functional Rating & Trend	Miles
Jones Creek	Shambo Unit	317	PFC	0.4
Bean Creek	Shambo Unit	300	PFC	0.6
Tipton Creek	Shambo Unit	395	FAR-Up	1.4
Curry Creek	Shambo Unit	1626	FAR-Up	1.6
Jones Creek trib	Shambo Unit	321	PFC	1.2
Winslow Creek	Shambo Unit	1636	PFC	0.6
Bean Crk, WF trib	Shambo Unit	1651	FAR	1.0
Jones Creek trib	Shambo Unit	1639	PFC	1.5
Jones Creek trib	Shambo Unit	1640	PFC	1.2
Jones Creek	Shambo Unit	1641	PFC	1.1
Jones Creek trib	Shambo Unit	1642	PFC	1.6
Jones Creek	Shambo Unit	2502	PFC	0.6
Bear Creek	Shambo Unit	2505	PFC	0.4
Bear Creek	Shambo Unit	1647	PFC	0.3
Bean Creek, WF	Shambo Unit	301	PFC	0.7
Curry Creek trib	Shambo Unit	1623	PFC	0.9
Lima Reservoir trib	Shineberger	384	PFC	0.8
Tom Creek	Tom Creek	377	PFC	1.2
Corral Creek	Tom Creek	304	PFC	0.8
Tom Creek	Unallotted	1609	PFC	1.5
Tom Creek	Unallotted	1610	PFC	1.4
Red Rock River trib	Unallotted	1629	PFC	0.3
Lima Reservoir trib	Unallotted	1696	PFC	0.4
Odell trib	Unallotted	1611	PFC	1.5
Odell trib	Unallotted	1612	PFC	1.2
Shambo trib	Unallotted	1615	PFC	1.4
Odell trib	Unallotted	1613	PFC	0.5
Shambo trib	Unallotted	342	PFC	0.9
Peet Creek, WF trib	Unallotted	1666	FAR-Up	0.1
Price Ditch	Unallotted	1680	FAR-Up	0.2

Where streams and wetlands were not at PFC, some of the concerns included: alteration of stream morphology, reduced access to floodplains, down cutting, reduction in species diversity and composition, reduced vegetative cover, limited vegetative species recruitment and

regeneration, reduced structural diversity, and/or decreased vigor of streamside vegetation. Generally, bank shearing, bare ground, ungulate grazing and browsing, over-widening, trampling, loss of deep binding roots, pugging and hummocking, sedimentation from roads, trailing and stream crossings, de-watering or diversion of streams for irrigation, past disturbances (wildfire, etc.), and conifer expansion were the causal factors. The IDT observed remnants of willows and aspen on most of the streams within the watershed that are now dominated by conifers. In the Red Rock allotment, dam operation and the resultant fluctuation of pool elevation create an unstable environment for shoreline vegetation. In the Shambo Unit, natural slumping is impacting stream function and/or habitat.

Figure 3.2 Corral Creek Drainage, Price Creek Allotment



Fish Habitat

There are 19 water bodies supporting fisheries on BLM administered land within the CW. Westslope cutthroat trout (*Oncorhynchus clarki lewisi*) (WCT), arctic grayling (*Thymallus arcticus*), mountain whitefish (*Prosopium williamsoni*), mottled sculpin (*Cottus bairdi*), longnose sucker (*Catostomus catostomus*), white sucker (*Catostomus commersoni*), longnose dace (*Rhinichthys cataractae*) and burbot (*Lota lota*) are native fish found in the Centennial Watershed. Rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), brook trout (*Salvelinus fontinalis*) and Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*) were introduced, probably about the turn of the century, within the watershed.

Streams within the assessment area generally do not support popular recreational fishing. The Red Rock River below Lima Dam supports a limited sport fishery for hybrid cutthroat, rainbow trout and an occasional brown trout. Hell Roaring and Odell Creeks support a limited fishery for

hybrid cutthroat and brook trout. Wolverine and Middle Creeks also support a limited fishery for brook trout/cutthroat trout hybrids and are popular among some local anglers.

Table 3.2 Fish Species Present in Streams on BLM - Administered Lands within the CW.

STREAM	SPECIES PRESENT ON BLM*	BLM STREAM MILES
Red Rock River (below Dam)	Rainbow trout, hybrid cutthroat trout, rainbow trout, brown trout, long nose and white sucker, mottled sculpin, longnose dace, mountain whitefish, burbot, mottled sculpin	0.9
Red Rock River (above Lima Reservoir)	Mottled sculpin, longnose sucker, white sucker, burbot, mottled sculpin	8.5
Lima Reservoir	Burbot, mottled sculpin, longnose sucker, white sucker, arctic grayling hybrid cutthroat trout, long nose dace	NA
Price Creek	WCT (92-96 %), mottled sculpin	12.1
Wolverine Creek	Brook trout	0.7
Corral Creek (East end)	Brook trout	2.7
Jones Creek	WCT (96%), mottled sculpin, longnose dace	3.8
Bean Creek	WCT (100%)	4.2
Bear creek	WCT (100%)	1.4
Odell Creek	Hybrid cutthroat, brook trout, mottled sculpin, mountain whitefish	0.9
Tom Creek	Brook trout	4.4
Hell Roaring Creek	Brook trout, hybrid cutthroat trout, mottled sculpin, mountain whitefish	2.9
Corral Creek (west end)	Brook trout	1.3
West Creek	Hybrid cutthroat trout, brook trout, longnose dace, arctic grayling	1.2
Middle Creek	Brook trout, WCT (97%), mottled sculpin	0.6
Peet Creek	<i>WCT restoration in progress currently fishless</i>	10.7
Long Creek	Brook trout, hybrid cutthroat trout, mottled sculpin, longnose sucker, white sucker, longnose dace	2.9
Winslow Creek	Hybrid cutthroat trout	2.9
Breneman Lake	Rainbow trout	NA

* Numbers in parenthesis represent the purity of the West Slope Cutthroat Trout sampled

Fishery habitat conditions on streams within the Centennial Assessment area are generally in good condition. Several streams have localized issues caused by livestock and/or roads. In many cases, streams were surveyed multiple times over the last 10 years to address data gaps in past fishery related surveys. These include evaluating WCT genetic purity, assessing suitability for WCT restoration and/or surveying for arctic grayling.

Generally, streams supporting special status species have been higher priority for fishery surveys and habitat monitoring in the field office. Non-WCT streams generally have not had fish habitat surveys conducted to date, but were assessed for riparian health during the watershed field assessment and are addressed in the riparian health section of this document. A detailed

description of assessed fishery habitat can be found under **Findings and Analysis** in the Centennial Watershed Assessment Report pages 81-90. Allotment-specific riparian and wetland health concerns are discussed below.

Antelope Peak Allotment - There is one lentic reach, #1750, on the west side of the allotment that is about 0.2 mile long. It was given a FAR rating by the ID team due to pugging and hummocking of the wetland area. There was also exposed bare ground and excessive trailing in the wetland area.

Fish Creek Allotment – There are seven reaches and six miles of stream in Fish Creek allotment. Specific streams in the allotment are portions of Fish Creek, Long Creek and Metzel Creek. Five of the reaches totaling about three miles and were rated as PFC. Two portions of Metzel Creek (reach 315 and 314) were rated as FAR. Both of the Metzel Creek FAR reaches had some bank shearing and over-widening of the creek (See picture below).

Figure 3.3 Reach 315, Metzel Creek, Fish Creek Allotment, FAR Rating



Long Creek AMP Allotment – This allotment has sixteen distinct reaches which include portions of Long, Middle, West, Wolverine, Mohican, Piute and Crow Creek. Twelve of the reaches totaling about 10 miles were rated as PFC. Two reaches, 339 and 340 were rated as FAR-Up. Two additional reaches, West Creek #378 and a tributary of Wolverine Creek #1600 were rated as FAR. Both Wolverine Creek and West Creek were over-widened with exposed banks in places.

Morton Individual SGC Allotment – There are two separate reaches on this small allotment. One reach, 303, is about 0.6 miles long and was rated as PFC. The second reach, 1608, called

Corral Creek tributary (0.1 miles long) was rated as FAR due to trampling of stream banks, loss of deep binding root vegetation to grazing and over-widening of the stream.

Mud Lake Allotment –There are three lentic reaches in this allotment. One reach along Corral Creek was rated as PFC. Two other reaches (1694 and 1719) were rated as FAR-Up due to some over-widening of the channel and occasional exposed banks.

Passmore Allotment- There is one reach on this small allotment #320. This reach is part of Jones Creek and was rated as FAR with an upward trend. There is a wetland complex (#1643) about one acre in size that was rated as PFC.

Peet Creek Allotment –There are eleven reaches on the Peet Creek allotment. Nine of the reaches on both Peet and Bean Creek were rated as PFC. Two reaches, 1653, on the East Fork of Peet Creek and 1651 a Bean Creek Tributary were rated as FAR. These reaches were over-widened in accessible areas and had some bank shearing due to livestock trailing.

Red Rock Allotment – This small allotment has about one mile of the Red Rock River just below Lima Reservoir Dam flowing through it. It was rated FAR by the ID Team. The reach has impacts along the banks of the Red Rock River and noxious and invasive weeds were found along the banks. In addition, the wide fluctuation of water flow coming out of Lima dam leaves the banks unstable.

Shambo Units Allotment –The Shambo allotment is a large allotment found along the Continental Divide up to the Idaho border. It has 29 different riparian reaches totaling about 29 miles of streams. Portions of streams found in the allotment include Bean, Bear, Curry, Jones, Tipton and Winslow Creek and their tributaries. Most of the reaches (23), were rated PFC by the ID Team.

Figure 3.4 Curry Creek Drainage, Shambo Allotment , July 2014

Seven reaches (1625, 1634, 1635, 1627, 395 and 1626) were rated as FAR with an upward trend. All of these reaches are located inside the boundary of the Winslow wildfire of 2003 and are still recovering from the burn event.

3.2.2 Issue #2: Upland and Sagebrush Steppe Habitat

Sagebrush and grassland habitat types make up 58% of BLM administered lands in the CW. Of this, 49% is in the sagebrush/mountain shrub cover type and 9% is grassland. This area supports a significant diversity of sagebrush species and communities, and sagebrush-dependent wildlife species. In the valley, low sage (*Artemisia arbuscula*) and alkali sage (*Artemisia arbuscula longiloba*) are the dominant sagebrush species with intermixed three-tip sagebrush (*Artemisia tripartita*) as elevation increases. This habitat provides breeding and winter habitat for sage grouse, seasonal use by pronghorn antelope and elk and localized, yearlong habitat for sagebrush-obligate species such as pygmy rabbits. The higher elevations transition from a mix of three-tip sagebrush habitat to mountain big sagebrush (*Artemisia tridentata vaseyana*), communities and provide elk calving and sage grouse brood-rearing habitat along with dispersed spring, summer and fall habitat for numerous other species often in association with forested habitat. Occurrences of basin big sagebrush (*Artemisia tridentata tridentata*) and silver sage (*Artemisia cana*) intermingled with mountain big sagebrush, three-tip sagebrush, and several low sages create mixed sagebrush stands that add to the diversity of vegetation and habitat structure within the watershed.

Daubenmire range monitoring trend studies were read in 2013 throughout the CW. These studies are located primarily in alkali sage, three tip sage and mountain big sage habitats; the average sagebrush canopy cover (CC) was 13%, herbaceous CC was 19% and forb CC was 12%.

Data was collected at twenty-one sage grouse vegetation monitoring plots during 2014 in similar habitat types. This data averaged 36% CC of sagebrush and shrub height averaged 28 cm. Herbaceous CC averaged 55% and 11 cm in height. The canopy cover and heights of shrubs and herbaceous vegetation is highly variable based on species composition and soil types. The range in vegetation heights and cover amounts in this data relate to the location of permanent range study sites that were established in locations to document potential changes in range condition and may or may not have sage grouse use areas. The sage grouse vegetation plots were selected based on known sage grouse uses (telemetry re-locations, near leks, or personal observations) and is more representative of habitat actually used by sage grouse in the CW. Sage grouse are discussed further under Issue #4 below.

The uplands on 33 allotments comprising over 98% of the BLM-administered uplands in the CW assessment area were found to be functioning properly under existing management. The ID Team found several resource indicators with moderate departures from what is expected in similar sites in properly functioning condition on three allotments. These three allotments, comprising less than 2% of the public uplands in the CW, were not properly functioning. The uplands on Morton Individual, Red Rock and Rody Individual allotments were rated as FAR by the IDT. More information about each allotment's upland health is included in the Centennial Assessment Report. Conifer expansion into mountain big sagebrush habitat is affecting Upland Health within the majority of the allotments on the south side of the watershed and is discussed under Issue #3.

3.2.3 Issue #3: Forest and Woodland Habitat

Forest and woodland habitats comprise approximately 17% of all ownerships, and approximately 30% of BLM-administered lands within the CW. Effective precipitation and aspect influences the establishment and composition of forests and woodlands. Common conifer tree species found in the CW include Douglas-fir, lodgepole pine, Englemann spruce, subalpine fir, limber pine and whitebark pine. Aspen, willow and a variety of other primarily riparian-obligate deciduous tree species contribute to structural diversity and canopy cover of these forest and woodland types.

Forest structure, density and species composition has notably shifted in the low to mid-elevation conifer forests of the CW. This shift, largely the result of fire exclusion, has allowed recent insect outbreaks to affect multiple conifer tree species over large areas causing mortality, defoliation and susceptibility to other stressors. In addition, many low elevation forest communities have stalled in mid to late-development succession classes, with little representation of an early seral class. These changes in forest condition have also affected the characteristics of fuels available to wildfire, potentially increasing the extent or severity of future fires, compared to those that occurred prior to Euro-American settlement. Aspen decline due to the absence of disturbance, conifer expansion, and drought has reduced overall habitat biodiversity and negatively affected hydrologic cycles. High elevation whitebark pine communities have experienced widespread mortality from a combination of non-native white pine blister rust and mountain pine beetle.

Commercial harvest of lodgepole pine in the 1980's and the subsequent regeneration of young lodgepole pine stands provides some small-scale age-class and structural diversity. More recent

commercial harvest, primarily within Douglas-fir and some mixed conifer stands, stands has also shifted stand structure to be more resilient to ongoing and future insect and disease outbreaks, as well as to withstand future fires.

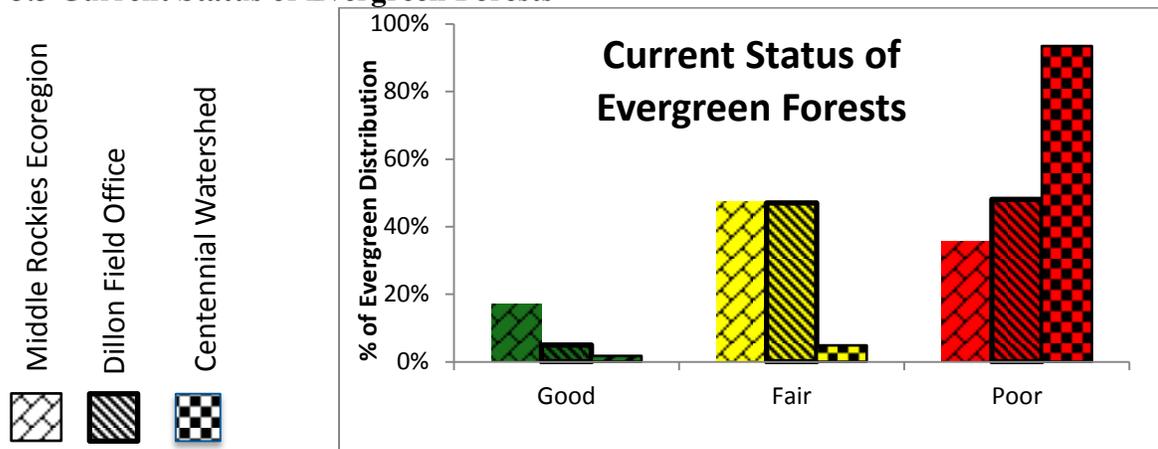
Rapid Ecoregional Assessment (REA) Input

The evergreen forest woodland vegetation system encompasses nearly 25 percent of the Middle Rockies ecoregion. The BLM REA summarizes data from numerous sources to show the current status of evergreen forests, and to forecast future threats. Table 3.3 shows the current status of the forest in the entire Middle Rockies ecoregion, the Dillon Field Office, and the CW. The REA assigned a ranking of Good, Fair or Poor based on forest insect infestations and departure from simulated historical vegetation reference conditions.

The United States Forest Service Aerial Detection Survey polygon data from 1994-2010 were used to map insect presence in the evergreen forest, and to describe landscape condition. Mountain pine beetle is recognized as the most serious insect threat in the ecoregion so it was analyzed separately from other beetles. Western spruce budworm is a defoliator having widespread impacts, and was also analyzed separately. The higher the percent insect infestation calculated, the poorer the score.

For landscape structure, the LANDFIRE Vegetation Condition Class (VCC) data were used to show changes in vegetation and fuels from their historical condition. Three condition classes describe low departure (VCC 1), moderate departure (VCC 2), and high departure (VCC 3). For the Middle Rockies, a group of subject matter experts went through an exercise to illustrate fire regime (frequency and severity) departure. The historic biophysical setting (BpS) was attributed with a current fire severity and frequency and then compared with the reference (historic) fire frequency and severity for each type. From these data, maps were developed to show fire frequency departure and fire severity departure. They were then merged into a composite map (which took the highest of either departure). This modified composite layer was used as the best indicator for potential threat to the evergreen forest from an uncharacteristic fire. A VCC departure=1 is Good, VCC departure=2 is Fair, and VCC departure=3 is Poor.

Table 3.3 Current Status of Evergreen Forests



Currently, approximately 36% of the evergreen forest in the Middle Rockies ecoregion is rated as Poor, compared to 93% of the Centennial watershed evergreen forest in the same rating. Though forest insect activity appears to be decreasing in recent years, the ongoing infestations, combined with high VCC departure, contribute to the 93% Poor rating.

Douglas-fir Forest

Douglas-fir forest is abundant on the south side of the valley extending from the forest-grassland ecotone to mix with wetter, higher elevation spruce-fir and lodgepole forest. On the north side of the valley Douglas-fir is found in isolated forest patches, occasionally mixing with lodgepole pine. The lower elevation, xeric Douglas-fir forests throughout the Centennial Valley were historically influenced by the relatively short fire return interval of the adjacent sagebrush/grassland. This is evidenced on both sides of the valley by large diameter, widely spaced relic Douglas-fir trees with multiple fire scars. Trees less than 150 years old without evidence of past fire have filled in around these relic trees creating dense, multi-storied stands in abundance today. Without the regulatory effects of fire, much of the lower elevation Douglas-fir forest is currently departed from historic fuel loading, structure, species composition, and biodiversity. Tree density has more than tripled in the Baldy Mountain area since pre-EuroAmerican settlement (Korb, 2005), and this young age class of trees has expanded into sagebrush/grassland and aspen. Douglas-fir forest expansion has replaced once prevalent aspen-dominated communities that depended on periodic disturbance by fire. Research indicates that greater than 70% of the area historically occupied by aspen has been lost in mid-to lower-elevation forests of the eastern Centennial Mountains, much of which is attributed to conifer encroachment and eventual species conversion (Gallant et al. 2003). Aspen remnants, or skeletons, are common throughout Douglas-fir forests in the CW. Scattered limber pine is also found amongst Douglas-fir stands on drier sites.

Douglas-fir bark beetle has been active in Douglas-fir stands throughout the valley at varying levels over the past 10-15 years killing many relic, large-diameter Douglas-fir, as well as co-dominant trees stressed by drought and repeated spruce budworm defoliation. The current unnaturally dense, multi-storied stand structure of these forests exaggerated effects of these native insects. In the past few years, Douglas-fir beetle activity appears to be moderating, confined primarily to individual large-diameter trees. Spruce budworm defoliation and top-kill is still evident throughout the forests in the CW, but the summer larvae dispersion and the adult moth hatch appear to have slackened in the past few years. Repeated defoliation events can decrease tree growth, cause mortality, or increase susceptibility of trees to other damage agents such as bark beetles.

Mixed Conifer Forest

Upslope of the xeric Douglas-fir dominated forest, mesic Douglas-fir and lodgepole pine stands mix with scattered aspen clones present. Englemann spruce is found on moist sites, particularly on cool, shady aspects and in stream bottoms. Subalpine fir becomes more common at higher elevations, generally above 7,500 feet. Historically, fire played a role in shaping these forests, though with less frequency and often higher severity than the lower elevation Douglas-fir stands. Consequently, many of the dense, multi-storied forest stands with heavy downed fuel accumulations are within the historic range of variation, but also subject to stand replacing wildfire.

Widespread outbreaks of mountain pine beetle have killed mature lodgepole pine throughout the northern Rockies over the past 10-15 years, including the Centennial Valley. As suitable host trees decline, the beetle population also returns to endemic levels. Currently, mountain pine beetle activity in the CW is limited to remaining pockets of mature lodgepole pine. The standing dead trees killed in the past decade will contribute to ground fuel loading as they fall over the next decades. Mountain pine beetle and white pine blister rust have killed most mature whitebark and limber pine trees (five-needle pines). Young five-needle pines are primarily found as isolated individuals or clumps at the mid-elevations. Dwarf mistletoe is present, particularly in lodgepole pine, but does not appear to be affecting tree growth or vigor to a large extent. Spruce budworm has affected all conifer species except lodgepole pine, but activity is currently declining. The evidence of the recent past spruce budworm and balsam bark beetle outbreak is still very apparent in subalpine fir, particularly on the eastern end of the Centennial Mountains. The multi-storied stand structure and mixed species conifer stands contributed to near complete defoliation, and in some areas mortality, of understory subalpine fir. Spruce beetle is present at endemic levels and is causing mortality of mature spruce trees where they occur. Spruce-dominated drainages on the eastern end Centennial Mountains appear to be the most affected.

Subalpine Forest

Above approximately 7,500 feet elevation, the dominant timber type shifts to subalpine fir with scattered lodgepole pine, and concentrations of Engelmann spruce in moist areas. The highest elevations are occupied by krummholz subalpine fir and five-needle pines. A variety of insects are affecting suitable host trees on the lower fringes of the subalpine forest type, though site conditions and varied stand structure limit activity. Whitebark pine is present but approximately 90% of the mature population has been killed by a combination of white pine blister rust and mountain pine beetle. At high elevations within the CW, young whitebark pine is found growing amongst the standing dead trees, and some trees are producing cones. White pine blister rust is continuing to cause branch and stem cankers of many of the live trees, which will likely result in eventual top-kill or complete girdling. Whitebark pine is recognized as a keystone species at high elevation habitats. The seeds are an important wildlife food source, and intact stands improve snowpack retention, which aids in watershed protection from rapid spring run-off and ensures more consistent water flow during the summer months.

The higher elevation forest types may still be within their historic fire return interval, though fuel accumulations are currently present to support fire spread, as evidenced by the 2003 Winslow Fire. The Winslow Fire exhibited higher burn severity, larger stand-replacing patch sizes, and an absence of surviving trees compared to historic fire patterns (N. Korb, 2005).

Aspen

Most existing aspen stands include some conifer component in varying stages of succession. Within some aspen clones, young, shade-tolerant conifers have established in the understory but are not yet shading-out the mature parent stand. The young conifers will begin to affect aspen regeneration as they restrict sunlight from reaching the ground. More commonly, existing aspen stands are mixed with conifers that have overtopped the aspen trees, shading them and causing overstory aspen mortality. The aspen clone root systems may continue to remain viable with

only several live stems, potentially capable of reproduction following a disturbance that stimulates the root system and/or once full sunlight is allowed to reach the ground.

2003 Winslow Fire Regeneration

In 2003, the Winslow Fire burned over 13,000 acres in the Centennial Mountains of Montana and Idaho, including 6,111 acres of BLM-managed land within the CW. The fire burned over the course of several months, resulting in a mosaic of burn severities. Though not all areas within the fire perimeter experienced severe, stand replacing fire, the severely burned areas in the 2003 Winslow Fire were greater in size and proportion than those which occurred in 1863, the last extensive active fire year in the Baldy Mountain area (Korb, 2005). Stimulated by the Winslow Fire, aspen regeneration is abundant and robust. In 2014, the United States Geological Survey (USGS) sampled aspen regeneration density within the Winslow Fire burn area and found the smaller size class of aspen (less than 2 meters in height; less than 5 cm in diameter) in excess of 8,000 trees per acre (Shinneman, unpublished data, 2014). In Curry Creek, most young aspen is now above browse height and sight distances are limited to several feet. Lodgepole pine is not regenerating as would be expected following a stand replacing fire. Seedlings are isolated and most are less than four feet in height. The cones/seeds from the previous stand appear to have not responded favorably to fire, possibly indicating the previous lodgepole pine stand was a non-serotinous or semi-serotinous cone producing population. Whitebark pine regeneration within the burned area is uncommon. Site conditions are ideal for natural regeneration but the whitebark pine seed source is very limited due to widespread insect and disease caused-mortality.

3.2.4 Issue #4: Special Status Species Habitat

Native westslope cutthroat trout (WCT) in Montana are currently listed as a special status species. WCT populations within the CW are characterized by small isolated populations residing in small stream habitat. It is estimated that WCT populations are genetically unaltered in only 2.5% (McIntyre and Reiman 1995) to 10% (Shepard et al. 2002) of their historical range. The remaining pure populations within the CW are a result of either the extensive irrigation diversions across the valley floor which isolated some streams from non-native trout populations in downstream waters and/or they reside in streams that were not artificially stocked with non-native trout species.

Historically, WCT were likely present in most perennial streams within the assessment area. There are currently five streams that support WCT on BLM-administered lands in the CW which include: Bear, Bean, Jones, Price and Middle Creek. Non-native salmonid introductions circa 1900 are the main factor in the loss of WCT populations within the area. Within the CW, Bear and Bean Creeks support genetically pure WCT. Additionally, there are three streams, Jones, Price and Middle Creek, that support slightly hybridized WCT populations. There is currently a WCT restoration project in progress in the Peet Creek drainage that when completed will restore pure WCT to approximately six miles of historic habitat.

The arctic grayling (*Thymallus arcticus*) was historically found in two areas in the lower 48 states; Michigan and Montana. Today, the Michigan population is extinct. Native populations in Montana have been reduced to about 5% of their native range due to habitat degradation, overfishing and competition with non-native species. Montana has two remaining native

populations. One population is found in the Big Hole River drainage and the second is found in the Centennial Valley. A fluvial or river dwelling population has been re-established in the upper Ruby River Drainage. Additionally, over 30 populations have been established in lakes throughout the state. Over the last two decades, the federal status of grayling in Montana has been in question. Below is a timeline detailing status changes for the Montana grayling population during the Threatened and Endangered Species listing process.

<u>Year</u>	<u>Status</u>
1991	Arctic grayling petitioned for listing under the ESA.
1994	The USFWS determined that listing the grayling of the upper Missouri River was "warranted but precluded".
1994 to 2004	Grayling considered a candidate 9 species.
2004	The listing priority was upgraded to 3 due to continued lack of recovery.
2007	USFWS determined Montana grayling not a listable entity under the ESA because it did not constitute a species, subspecies or Distinct Population Segment.
2010	USFWS determined that listing the "Upper Missouri River basin Distinct Population Segment" of arctic grayling, as threatened or endangered under the Endangered Species Act is warranted, but that listing the fish is precluded at this time by the need to complete other listing actions of a higher priority.
2013	The USFWS initiated a status review under the Endangered Species Act (ESA) for Montana grayling.
2014	USFWS announced that arctic grayling in Montana were deemed unwarranted for federal listing.

Currently, the only documented grayling habitat on BLM administered lands within the assessment area are Lima Reservoir and lower West Creek. However, grayling are present in several creeks downstream of BLM administered land within the watershed. In 2013 and 2014, Montana Fish, Wildlife and Parks surveyed Odell, Long and Tom Creeks within the assessment area with no documented arctic grayling occurrence on BLM administered land. However, grayling were found several miles downstream of BLM administered lands in these drainages.

Important sage grouse seasonal habitat is centered on breeding and winter complexes. Brood rearing habitats require a mix of forbs and insects for a high protein diet, usually in association with riparian habitats adjacent to sagebrush habitat. Winter diets consist of almost 100% sagebrush. Sage grouse populations and sagebrush habitats have declined in the Western United States on a regional basis due to significant habitat losses range-wide: from habitat agricultural conversion, urbanization, improper livestock grazing management, and wildfire leading to annual grassland conversion. This emphasizes the importance of maintaining the integrity of all seral stages of sagebrush habitats on public lands.

Historically there were large flocks of sage grouse that migrated and wintered in Idaho. Telemetry data from 2005-2006 have shown that some migration still occurs into Idaho as grouse migrate southwest across Interstate 15 to winter in Idaho or in the Snowline area in southwest Montana. This telemetry data has also documented sage grouse seasonally migrating north into the Basin Creek area. However, many sage grouse do stay and winter in the Centennial Valley. This migration may be dependent on annual snow pack conditions. Yearly counts of displaying

males on leks in the CW have remained relatively stable in the past 10 years and in 2014 the average male attendance per lek was the highest since 2007 (District files.) Several potential new leks have been identified in the CW in the past few years by the BLM and TNC.

Pygmy rabbits are found throughout the CW in suitable sagebrush habitat. Pygmy rabbits are endemic to sagebrush and are the only rabbit on the continent to dig their own burrows. Pygmy rabbits require sagebrush for forage and cover, as well as deep alluvial soil to dig burrows. Sagebrush comprises nearly 100% of their winter diet and over half of their summer diet. Estes-Zumpf (2008) recently documented that the Idaho and Montana populations are genetically linked and much more mobile than previously thought. Pygmy rabbits still occupy all of its historical range in Montana and the Dillon Field Office. Montana Heritage program has documented occurrences outside of the historic range in Montana in past years (Hendricks et al. 2007). Pygmy rabbit populations that were documented by Rauscher (1997) as well BLM personnel in 2004-05 were still active throughout the CW in 2013 and 2014.

Wolverines occur in coniferous montane forest types preferring rugged, isolated habitats. Home range size for females and males averages 422 km² in Montana (Foresman, 2001). Wolverines can be found on National Forest lands adjacent to BLM lands and most likely use the Centennial Mountains as a dispersal corridor.

Bald and golden eagles are still protected under the Bald and Golden Eagle Protection Act, and are BLM sensitive species. There are several known bald and golden eagle territories in the CW that continue to reproduce fledglings. The numbers of bald eagles observed during the mid-winter bald eagle counts are increasing as well.

The peregrine falcon was delisted in 1999. In the mid-1980s there were no breeding pairs documented in Montana. Statewide Montana populations have gone from 14 active eyries in 1994 to 140 known eyries that were monitored in 2014 (Montana Peregrine Institute 2014.) Peregrine falcon management in the CW has centered on re-establishing natural eyries or territories. In the mid-1980s three hack towers were built in the valley along with a hack box placed in Hell Roaring Creek to assist with re-establishing peregrine falcons in the CW. Two of the hack towers in the valley overlook sage grouse leks, and with natural eyries established and numbers dramatically increasing statewide they may no longer be needed to supplement the population.

The CW borders the Beaverhead – Deerlodge National Forest to the north and Caribou – Targhee forest to the south. The area surrounding the CW has been identified as occupied habitat for grizzly bear distribution outside the Yellowstone Recovery Zone. Public lands in the CW provide secure linkage habitat and protection for grizzly bears moving between recovery zones. The population estimate for grizzly bears in the GYA in 2010 was 582 and the population was increasing at approximately 4.2% annually in 2009 (USDI 2011). A Montana state management plan is being developed that would direct grizzly bear management if future delisting were to occur.

The Priority Linkage Assessment completed by American Wildlands in 2008 identified the CW as one of the highest linkage corridors in the High Divide. This includes habitat for all big game species as well as large carnivores such as black bears, grey wolves, grizzly bears, mountain

lions and wolverines. The Middle Rockies Rapid Ecological Assessment used the American Wildlands Corridors of Life (ACLOL) model to depict grizzly bear habitat suitability for the CW. Based on habitat quality, the Centennial Mountains rate out as core and sub-core habitat with the valley rating out as secondary habitat acting as a corridor for connectivity between occupied habitats. This is depicted by shortest distance and high centrality to occupied habitat and has the highest landscape condition based on grizzly bear habitat requirements.

There are currently seven known sensitive plant species within the Centennial watershed boundary. One of which is whitebark pine which is discussed above in section 3.2.3. All of these plant species are found on BLM administered land within the watershed.

Three of the special status plants exist only in the sand dunes of the Centennial Valley. These three species are Fendler cat's-eye, painted milkvetch, and sand wildrye. Pale evening primrose does not have the special designation as sensitive but it is worth mentioning because it is a species of concern. All four plant species require early seral habitat within the sand dunes. Special management has been implemented in the Centennial Sand Dunes Area of Critical Environmental Concern (ACEC) over the past several years to work at destabilizing these sand dunes for the benefit of rare plants. All four of these plant species typically decline as perennial, late seral vegetation colonizes areas of formerly open sand. The BLM has partnered with The Nature Conservancy to continue monitoring these plants. Monitoring results have indicated that continued destabilization of the sand dunes is necessary to provide this important habitat.

Figure 3.5 Centennial Valley Sand Dunes habitat, Sand Dunes Allotment



Idaho sedge inhabits riparian areas scattered throughout the Centennial valley on both private and BLM administered land.

Railhead milkvetch inhabits grasslands and sagebrush steppe habitats. It is vulnerable to intensive grazing and weed invasion. However, the only known population of this species in the Centennial valley exists in an unallotted section of BLM administered land.

Beautiful bladderpod inhabits harsher sites in the Centennial Mountains. It is found growing in sparsely vegetated sites in the montane and the subalpine zones.

3.2.5 Resource Concern #1: Noxious and Invasive Species

Noxious weeds are defined in the Montana Weed Management Plan as “plants of foreign origin that can directly or indirectly injure agriculture, navigation, fish or wildlife, or public health.” Currently there are 35 weeds on the statewide noxious weed list that infest about 7.6 million acres in Montana. Of these 35 there are only two of major concerns in the CW: spotted knapweed and houndstongue. Canada thistle (*Cirsium arvense*), another state declared noxious weed, is also found in the CW. It is widespread throughout the Dillon Field Office and mostly found in riparian areas, making treatment difficult.

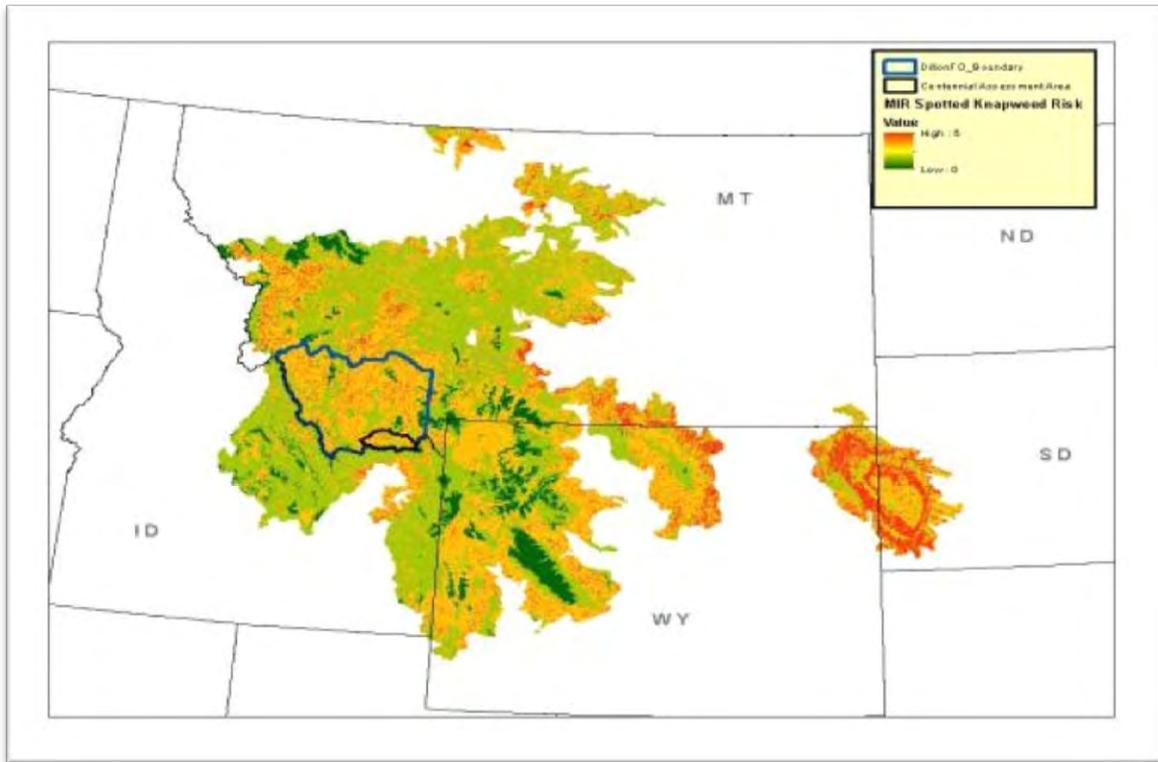
Other noxious or invasive weeds present in isolated locations are cheatgrass (*Bromus tectorum*) hoary cress (Whitetop) (*Cardaria draba*), black henbane (*Hyoscyamus niger*), common tansy (*Tanacetum vulgare*).

Noxious or invasive weeds that could present a threat to the CW in the future include; dyer’s woad, yellow starthistle and rush skeletonweed. All of these plants are found relatively close to the watershed and could be a major threat if allowed to spread into the area. In 2007, the BLM became involved in the Continental Divide Barrier Zone project which works to improve communication between counties and agencies within Idaho and Montana concerning noxious weed locations. The goal of this partnership project is to stop the spread of yellow starthistle and rush skeletonweed before they become established in Montana.

In 2009 a cooperative effort by Beaverhead County, The Nature Conservancy, Red Rock Lakes National Wildlife Refuge and the BLM was started where each partner is assigned a section of the Centennial Valley to inventory and treat for noxious weeds. Throughout this period the goal has been to prevent new noxious weed infestations and control or eradicate existing infestations within the CW using Integrated Pest Management.

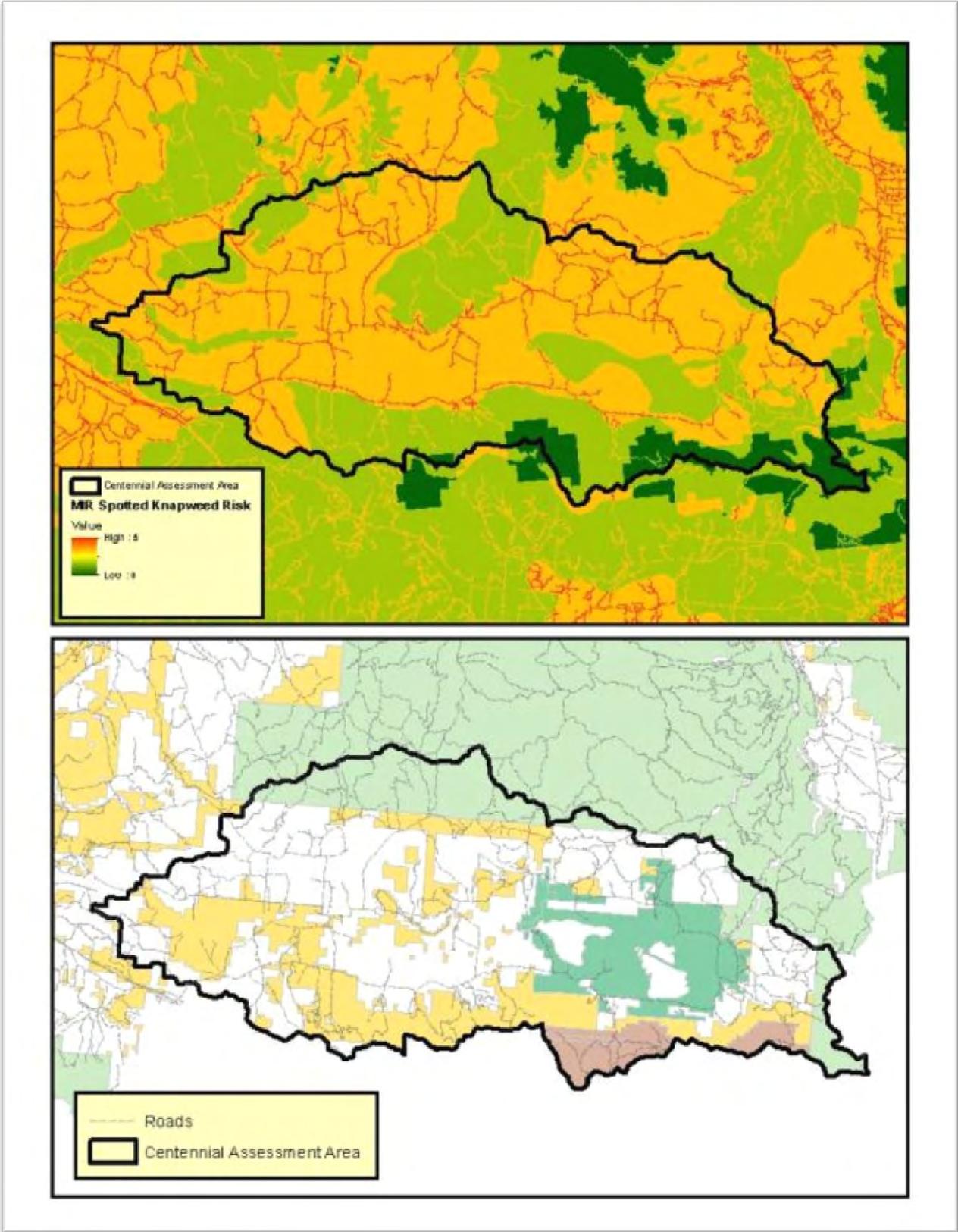
Rapid Ecoregion Assessment (REA) Input

Using data from the MR REA map shows which areas within the REA are most vulnerable to infestation by spotted knapweed. The model looked at the factors that were most likely to influence knapweed establishment such as: elevation, precipitation, vegetation types, soils and proximity to roads. Map 1 below shows the entire Middle Rockies REA’s risk to knapweed invasion. Red is the area of highest risk of invasion with yellow being moderate and green the lowest area of risk.

Map 3.1 Areas in MR REA Most Vulnerable to Spotted Knapweed Invasion

Maps 3.2 and 3.3 listed below show the MR REA zoomed in to the CW. The top map is the risk assessment of spotted knapweed invasion in the CW, while the bottom map shows the main roads within the Centennial Valley. Comparison of the two shows that the areas where roads are present align almost exactly with the areas of highest risk to invasion. While roads are one of the main factors to determine risk of noxious weed establishment, it takes all the factors present to make the highest risk category. Some of the CW has the highest risk for noxious weed establishment. In these areas, it would only take a disturbance, i.e. new road, to begin the noxious weed invasion.

Map 3.2 and 3.3 Centennial Watershed Roads and Risk of Spotted Knapweed Invasion



3.2.6 Resource Concern #2: Socioeconomics

Ranching and farming (i.e., hay production) are critical components to the economic well-being of the various communities in Beaverhead County. Of Montana's 56 counties, Beaverhead County is the largest livestock producer. The USDA 2007 Census of Agriculture Inventory (<http://www.agcensus.usda.gov/publications>) indicated that there were 212,412 head of cattle and calves and beef cattle in the county. Beaverhead County was also third in sheep production with 14,065 sheep and lambs inventoried. Very few grain-fed cattle were produced. The focus was on calves and feeder steers along with beef cows or breeding stock. This type of ranching requires large expanses of grazing land.

According to the National Agricultural Statistical Service (<http://www.nass.usda.gov/mt/>), overall cattle production in Montana has been relatively stable since 1986. The January inventories in 1986 and 2002 reported 2.45 million head with a peak of 2.75 million during 1996. Sheep production, on the other hand, showed a general decline across the state, reflecting a broader national pattern. The data from 2010 reports that, of Montana's 56 counties, Beaverhead county ranked 1st in total hay production. The data from 2011 reports that, Beaverhead county ranked 1st in total cattle numbers and 3rd in sheep numbers.

Within the CW, there are 19 different business entities or individuals currently authorized to graze livestock on the 74,610 acres of BLM administered lands on the 36 grazing allotments. Those grazing permittees are authorized to harvest about 10,300 public land AUMs annually. Qualified individuals and business enterprises are authorized to graze livestock through a ten year term grazing lease/permit (43 CFR 4110). Many ranches use allotments that combine public and private land pastures in a comprehensive management plan. In most cases, private land owned by the lessees is adjacent to, or intermingled with, BLM administered land. All aspects of the ranching operation including calving, breeding, haying, feeding, shipping, summer pasturing, and marketing schedules are planned and implemented with reliance on annual use of public land allotments during a portion of the grazing season. Changes in numbers of livestock, seasons of use, and/or increased labor inputs may have a considerable economic impact on individual operators.

Three commercial recreation providers are authorized on BLM lands to provide a variety of recreation opportunities for the public to enjoy the public lands in this area. Outfitters, and the guides they employ, offer opportunities for their clients to hunt, fish, ride horseback, hike, backpack, camp, and ski. Commercial activities may occur throughout the year, bolstering local economics yearlong. These permitted businesses provide jobs at least seasonally for approximately 12- 15 employees each year and generate \$100-200,000 annually.

3.2.7 Resource Concern #3: Wildland Urban Interface

Development within the Centennial watershed has been limited during the last century. Private lands still consist of mainly large blocks, with single landowners. Development concentrations are limited to Lakeview and immediate surrounding area (1 mile radius), including the Red Rock Lakes National Wildlife Refuge. The exclusion of fire on the landscape since pre-European settlement has resulted in the potential for uncharacteristic fire behavior, should a wildfire event occur. The Winslow fire in 2003 showed that potential with areas of higher burn severity, and longer event duration than historic fire regimes within the landscape (Korb, 2005). During the

last decade, fuels treatments have been implemented on a limited number of private lands within the wildland urban interface, adjacent Lakeview and in Alaska basin. Increases in fuel loading and associated potential for large scale wildfire events are expected to continue as a result of conifer expansion in sage/grasslands, large scale tree mortality from insect and disease, and the exclusion of wildfire as a natural disturbance agent.

3.2.8 Resource Concern #4: Cultural & Paleontological Resources

In conjunction with the Mountain Foothills Grazing EIS in the late 1970s, a Class II cultural resources inventory was conducted for a 10% sample of lands within the Dillon Resource Area. Results of the sample inventory indicated that cultural site densities within the CW were in the mid-range of site densities when compared to other watersheds, with an average density of 1 site per every 706 acres (1.10 sites per square mile).

An examination of existing records on file with the BLM Dillon Field Office has provided information on the number and type of known cultural resources and level of previous cultural resource inventories conducted on public lands within the CW analysis area. Within the study area, approximately 6,633 acres of public land have been intensively inventoried for cultural resources at the Class III level. Inventories are subject to specific project compliance in advance of all proposed federal undertakings including: small range improvements (fences, water developments), road rights-of-way, timber sales, fuels projects, and land exchanges. The inventory projects vary from as little as one acre, to as much as 600 acres in extent.

As a result of past Class II and Class III cultural resource inventory, there are a total of 170 recorded cultural properties within the CW study area. Of that number, 95% are prehistoric and 5% are historic. A total of one paleontological site is known within the watershed.

The Lakeview Ski Chalet (Township 14 south, Range 2 west, Section 26) was constructed in 1965 for the purpose of providing recreation for residents of Lakeview. The ski operation discontinued in 1971 and the ski chalet was used in association with a hunting outfitter/dude ranch. In 2003, due to non-compliance, the ski chalet became the property of the United States. Due to minimal access, the ski chalet has not been maintained and includes several hazards making the building unsafe for public use. Therefore, in 2013 the BLM issued a decision (DOI-BLM-MT-B050-2013-027-CX) to dismantle the ski chalet and in effect removing it as a public hazard. In 2015 the ski chalet turned 50 years old meeting Montana's minimum definition of a cultural property and requiring all future actions to be implemented in accordance with the National Historical Preservation Act. At this time no planned actions involving the ski chalet have been determined and the building would be managed in a state of arrested decay.

3.2.9 Resource Concern #5: Recreation and Travel Management

Recreational use on BLM lands in the Centennial Watershed is generally light to moderate with the exception of the big game hunting season when use increases substantially. Hunting use levels fluctuate dramatically in this area with changes in snow and weather conditions as well as changes in hunting regulations. Antelope hunting is very popular in the valley, while elk and mule deer hunting is the dominant use in the mountains. The limited amount of motorized vehicle access in the Centennial Mountains seems to be attracting additional elk hunting pressure as off-road vehicle violations in other areas seems to be increasing and disrupting more hunting

opportunities displacing the more traditional hunters from those areas into the Centennial Mountains.

Another recreational attraction to this area includes the Continental Divide National Scenic Trail (CDT), which traverses the high country through the Centennial Mountains, luring horseback riders, hikers, and backpackers to some of the spectacular scenic and recreational opportunities available during the summer months. The CDT meanders back and forth across the divide as well as multiple land managing agency boundaries; including USFS, Agricultural Research Service (ARS), and BLM. The primary access to the trail on the Montana side of the divide is by way of tributary trails maintained and managed by the BLM (except Odell Creek Trail managed by the USFWS). Maintenance on some of the trails in the Centennials has been neglected over the years, and additional work is needed to restore them to more sustainable and functional condition. The Centennial Mountains Travel Management Plan completed in 2001 identified which trails in the Centennials would be maintained by the BLM over the long term. Those decisions were carried forward and adopted in the 2006 Dillon RMP.

Also very popular throughout the summer is use of the valley roads for bicycle and motorcycle touring. These popular recreation activities draw many visitors to the valley, though their use of BLM lands is relatively minimal off of the county roadways. Most cyclists, both motorized and non-motorized use the USFWS campground at Upper Red Rock Lake, though a few may use roadside camping on undeveloped BLM lands adjacent to the county roads on both the north and south valley roads.

Travel Management

As a result of the 2006 Dillon Field Office RMP, public motorized wheeled vehicle use is limited to those routes designated as open. All other routes are considered closed, with few exceptions to accommodate administration of permits, to access private lands, or other limited circumstances. Corrections of mapping errors in the original route designations in the RMP and other minor adjustments to route designations will be made through this watershed assessment process and specified in the environmental assessment and decision record.

Wolverine Creek Road – BLM has held an access easement across State Lands on this road for many years, but the route is in very poor condition. Resources have been negatively impacted by user traffic. This route has also been affected by the closure of segments across adjacent private property, resulting in loss of public access to public lands in this area. The DNRC and BLM continue to consult regarding modification of the existing easement to improve the road access, minimize resource impacts, and restore public access to this area of public lands.

Fish Creek Road – The Fish Creek road has a number of stream crossings in which users are having trouble crossing. In addition, these crossing are contributing excessive sediment into Fish Creek.

3.2.10 Resource Concern #6: Visual Resource Management

The entire Centennial Mountains Wilderness Study Area (WSA) is managed as Visual Resource Management (VRM) Class I, which provides for preservation of the landscape as the primary management goal. It would allow for natural ecological changes, but would not preclude limited management activity provided the changes to the characteristic landscape remained low, and did not attract attention. Several small areas immediately adjacent to the WSA are identified to be managed as VRM Class II to retain the existing character of the landscape, which would allow activities that should not be evident, or attract the attention of the casual observer. The remainder of the CW is within Visual Resource Management (VRM) Class III. VRM Class III objectives require partial retention of the existing character of the landscape and allow for moderate changes to the existing landscape. Management activities may attract attention, but should not dominate the view of the casual observer.

3.2.11 Resource Concern #7: Wilderness Characteristics

Approximately 27,691 acres of BLM lands within the CW are designated as the Centennial Mountains Wilderness Study Area. A study of these, and surrounding lands (including USFS, Agricultural Research Station (ARS), and State Lands) totaling approximately 92,815 acres, was completed in 1990 to assess the suitability of these lands for designation as wilderness. Approximately 21,774 acres of BLM-managed lands, 4,474 acres managed by the USFS near Mt. Jefferson, and 1,160 acres of land managed by the State of Montana were recommended for wilderness designation. Since the Centennial Wilderness EIS decision was completed, approximately 640 acres of those state lands have been added to the BLM-managed acreage. All BLM-managed lands within the wilderness study area, whether recommended for wilderness or not, are managed in accordance with BLM Manual 6330 entitled *Management of Wilderness Study Areas*. This manual, released in July, 2012 replaces the *Interim Management Policy for Lands under Wilderness Review* (BLM Handbook H-8550-1). Both current and former policies require that wilderness qualities (naturalness, opportunities for primitive and unconfined recreation, etc.) not be impaired until such time as Congress may make a final decision on whether to designate these lands as part of the National Wilderness Preservation System.

An inventory was conducted throughout the planning area for other lands with wilderness characteristics. One area adjacent to the Centennial Mountains WSA was determined to possess the minimum criteria for lands with wilderness characteristics. This unit was called Price Creek, and contains approximately 2,500 acres of BLM managed land. No special management is required for this area, but impacts to those characteristics must be described for any activities proposed to occur as a result of this environmental assessment. There are no activities in this area that would affect those characteristics.

3.2.12 Resource Concern #8: Air Quality

Red Rock Lakes Wilderness Area and Yellowstone National Park are Class I Federal Areas within and downwind of the Centennial Watershed. Class I Federal Areas require the highest level of protection under the Clean Air Act. For most of the year, air quality in rural southwestern Montana is excellent. Air quality issues occur during wildfire season and are limited to PM_{2.5} emissions which travel hundreds and even thousands of miles. Consequently, air quality in the area can be affected by fires located as far as California, Oregon, Washington and Idaho. Because pollutant emissions associated with wildfires are largely beyond human control,

exceedance of air quality standards that are associated with large wildfires are considered to be natural events and are typically exempted from consideration when determining NAAQS compliance. Air quality concerns in the planning area are primarily related to smoke. Smoke contributors in the planning area include wildfire, prescribed fires, private debris burning, agricultural burning, slash burning, and wood burning stoves and fireplaces. Prescribed burning is conducted in accordance with the Montana/Dakotas Fire Management Plan and is coordinated with MT DEQ and the Montana/Idaho Airshed Group. Airsheds and Impact Zones in Montana and Idaho closest to the Centennial Watershed are Salmon, Idaho and Butte, Montana to the West and North and Big Sky, Montana and Idaho Falls to the East and South.

3.3 Description of Relevant Non-Affected Resources

3.3.1 Climate Change

Climate change is defined by the Intergovernmental Panel on Climate Change (IPCC) as “a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and persist for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings such as modulations of the solar cycles, volcanic eruptions and persistent anthropogenic changes in the composition of the atmosphere or in land use.” (IPCC 2014). Climate change and climate science are discussed in detail in the Bureau of Land Management *Climate Change Supplementary Information Report for Montana, North Dakota, and South Dakota* (Climate Change SIR 2010). This document is incorporated by reference into this EA.

The IPCC states: “Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen.” (IPCC 2014) Global average temperature has increased approximately 1.5°F from 1880 to 2012 (IPCC 2014). Warming has occurred on land surfaces, oceans and other water bodies, and in the troposphere. A few of the many indications of global climate change include the following (IPCC 2014).

- Each of the last three decades has been successively warmer at the Earth’s surface than any preceding decade since 1850. The period from 1983 to 2012 was likely the warmest 30-year period of the last 1400 years in the Northern Hemisphere.
- Globally averaged atmospheric CO₂ concentrations have increased from approximately 285 ppm in 1850 to more than 380 ppm in 2010.
- Since the beginning of the industrial era, oceanic uptake of CO₂ has resulted in a 26% increase in ocean acidity.

As summarized in the Climate Change SIR, the Earth has a natural greenhouse effect wherein naturally occurring gases such as water vapor, carbon dioxide (CO₂), methane, and nitrous oxide (N₂O) absorb and retain heat. Without the natural greenhouse effect, the Earth would be approximately 60°F cooler. Current ongoing global climate change is caused, in part, by the atmospheric buildup of greenhouse gases (GHGs), which may persist for decades or even centuries. The buildup of GHGs such as CO₂, methane, N₂O, and halocarbons since the start of the industrial revolution has substantially increased atmospheric concentrations of these compounds compared to background levels. At elevated concentrations, these compounds absorb

more energy from the Earth's surface and re-emit a larger portion of the Earth's heat back to the Earth rather than allowing the heat to escape into space as would be the case with lower background GHG concentrations.

A number of activities contribute to the phenomenon of climate change, including emissions of GHGs (especially carbon dioxide and methane) from livestock production, fossil fuel development, large wildfires, activities using combustion engines, changes in land use, and changes to radiative forces and reflectivity (albedo) (UNFAO 2013). Each GHG has a different global warming potential that accounts for the intensity of its heat trapping effect and its longevity in the atmosphere. For example, methane has an average atmospheric lifetime of 12.4 years and N₂O has a lifetime of 121 years, but no single lifetime is given for CO₂ (IPCC 2014). Atmospheric GHGs will have a sustained climatic impact. Land use and/or land management activities that increase the ability of vegetation and soil to sequester carbon can help mitigate the effects of climate change. Such activities include improving/restoring riparian and wetland areas; improving age class diversity, health and resiliency of forests; mitigating the size and intensity of wildfires; and maintaining/improving livestock grazing management.

The USEPA published an inventory of U.S. GHG emissions reporting gross U.S. 2012 emissions of 6,526 million metric tons of carbon dioxide equivalent (CO₂e), and net emissions (considering carbon sinks) of 5,546 million metric tons (USEPA 2014). CO₂e emissions are determined by aggregating multiple types of GHGs by multiplying the quantity of each GHG by its global warming potential. Global GHG emissions during 2010 were estimated to be approximately 49 gigatonnes (10⁹ metric tons) of CO₂e (IPCC 2014). The CO₂e quantities estimated by the USEPA and IPCC reflect conversion of GHGs to CO₂e based on 100-year global warming potentials from the IPCC Second Assessment Report published in 1995, which were 21 for methane and 310 for N₂O. In the IPCC Fifth Assessment Report, the 100-year global warming potentials of methane and N₂O have been revised to 28 and 265, respectively. When warming over a shorter time period is considered, the 20-year global warming potentials of 84 for methane and 264 for N₂O may be more relevant. However, most GHG inventories used to determine GHG emission trends use 100-year global warming potentials.

Chapter 3 of the Climate Change SIR describes impacts of climate change in detail at various geographic scales. The following summary describes potential changes identified by the USEPA (USEPA, 2008) that are expected to occur within the Mountain West region.

- The region is expected to experience warmer temperatures with less snowfall.
- Temperatures are expected to increase more in winter than in summer, more at night than in the day, and more in the mountains than at lower elevations.
- Earlier snowmelt means that peak stream flow will be earlier, weeks before the peak needs of ranchers, farmers, recreationalist, and others. In late summer, rivers, lakes, and reservoirs will be drier.
- More frequent, more severe, and possibly longer-lasting droughts are expected to occur.
- Ecosystems will be stressed and wildlife such as the mountain lion, black bear, westslope cutthroat trout, Montana arctic grayling, marten, and bald eagle could be further stressed.
- Large-scale shifts have occurred in the ranges of species and the timing of the seasons and animal migrations. These shifts are likely to continue (USGCRP 2009). Climate changes include warming temperatures throughout the year and the arrival of spring an

average of 10 days to two weeks earlier through much of the U.S. compared to 20 years ago. Multiple bird species now migrate north earlier in the year.

- Crop and livestock production patterns could shift northward; less soil moisture due to increased evaporation may increase irrigation needs.
- Fires, disease pathogens, and invasive weed species have increased and these trends are likely to continue. Changes in timing of precipitation and earlier runoff increase fire risks.
- Insect epidemics and the amount of damage that they may inflict are also on the rise. The combination of higher temperatures and dry conditions has increased insect populations such as pine beetles, which have killed trees on millions of acres in the western U.S. Warmer winters allow beetles to survive the cold season, which would normally limit populations; while drought weakens trees, making them more susceptible to mortality due to insect attack.

More specific projected changes associated with climate change in Montana include the following (Climate Change SIR (2010)).

- Temperature increases in Montana are predicted to be between 3 to 5°F at mid-21st century and between 5 to 9°F at the end of the 21st century. As the mean temperature rises, more heat waves are predicted to occur. In the late 21st century, the number of days per year with temperatures above 100°F is predicted to be between 10 and 45, depending on the level of GHG emissions.
- Winter and spring precipitation may increase by up to 25 percent in some areas of Montana. Precipitation decreases of 20 percent or more may occur during summer, with potential increases or decreases in the fall.
- For most of Montana, annual median runoff is expected to decrease between 2 and 5 percent. Mountain snowpack is expected to decline, reducing water availability in localities supplied by meltwater.
- Water temperatures are expected to increase in lakes, reservoirs, rivers, and streams. Fish populations are expected to decline due to warmer temperatures, which could lead to more fishing closures.
- Wildland fire risk is predicted to continue to increase due to climate change effects on temperature, precipitation, and wind. One study predicted an increase in median annual area burned by wildland fires in Montana based on a 1°C (1.8°F) global average temperature increase to be 241 to 515 percent.

While climate change will continue to occur within the analysis area, it is extremely difficult to predict the precise location, timing, and impacts of climate change.

Chapter 4

4.0 Environmental Consequences

4.1 Introduction

This chapter discloses the scientific and analytic basis for comparison of the alternatives and describes the probable consequences (impacts, effects) of each alternative on the issues and resource concerns identified in Chapter 1. The environmental consequences are disclosed and analyzed by alternative for each issue and resource concern. This chapter also discloses the cumulative, or combined, impacts of alternative actions with past, present and reasonably foreseeable actions within the watershed.

Not every Key Issue and/or Resource Concern is relevant under each specific heading and therefore will not be discussed. And not every component within the Key Issues and/or Resource Concerns will be affected by the alternatives (i.e. not every species of wildlife in the watershed will be affected). If Key Issues, Resource Concerns and/or specific components within an issue are not discussed, they were either not present or present but minimally affected.

For each alternative where management changes or administrative actions are proposed, the predicted effects of each applicable action alternative(s) are presented for each identified issue or resource concern in the following order:

Issue #1: Riparian, Wetland and Aquatic Habitat.
Issue #2: Upland and Sagebrush Steppe Habitat.
Issue #3: Forest and Woodland Habitat.
Issue #4: Special Status Species Habitat.

Resource Concern #1: Noxious Weeds and Invasive Species.
Resource Concern #2: Socioeconomics.
Resource Concern #3: Wildland Urban Interface.
Resource Concern #4: Cultural and Paleontological Resources.
Resource Concern #5: Recreation and Travel Management.
Resource Concern #6: Visual Resource Management.
Resource Concern #7: Wilderness Characteristics.
Resource Concern #8: Air Quality.

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

4.2 Predicted Effects of Alternatives

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

Issue #1: Riparian, Wetland and Aquatic Habitat

There are 27 grazing allotments that contain riparian habitat in the Centennial Watershed. Twenty-two of the 27 are in compliance with the Riparian Health Standard. The allotments not in compliance are: Antelope Peak, Fish Creek, Long Creek AMP, Morton Individual SGC and Red Rock. Current grazing management in these allotments is contributing to these allotments not meeting the riparian standard.

Depending on topography and timing of use, livestock are generally expected to utilize riparian areas more than upland areas. Ungulates will effect riparian vegetation, channel substrates, suspended sediment and channel morphology under all alternatives including the no action alternative to some degree. Domestic ungulates, livestock, are drawn to riparian areas by forage and water as well as relatively favorable topography, which they prefer over steeper terrain and drier forage (Clary and Leninger, 2000). The authors, Clary and Leninger, discuss livestock behavior and their tendency to congregate in riparian areas. Their long-term presence can result in changes to stream channel profiles, channel bottom embeddedness, channel substrates, and streamside vegetation as well as lowering of water tables and replacement of plants with deep roots like sedges with shallow rooted species, like Kentucky bluegrass. In *“Quantifying the Effects of Livestock Grazing on Suspended Sediment and Stream Morphology”* (Benneyfield 2004), the author describes the effects of livestock grazing on channel morphology and streambed materials, while acknowledging the difficulty of quantifying sediment loading attributable to livestock. “Livestock trampling on streambeds leads to two major adverse effects on the functioning of the channel.” Suspended sediment levels increase and channels become wider and shallower. Stream power is reduced as channels became wider and shallower. In two separate studies in Oregon, cattle were found to use the riparian zone 12 to 20 times more than upland areas and 80% of the forage came from the riparian zone (Skovlin 1984).

When used, livestock supplement should be placed on ridges or terraces at least ¼ mile from the nearest livestock water source in areas naturally devoid of vegetation. Proper salting, and the efficient placement of supplements, like dehydrated molasses, improves cattle distribution and forage utilization away from sensitive riparian areas (Bailey, Welling and Miller 2001).

Riding and herding will continue to be emphasized and utilized to improve livestock distribution, reduce the amount of time cattle spend in riparian areas and increase animal production. BLM technical reference # 1737-20, *Grazing Management Processes and Strategies for Riparian-Wetland Areas* (2006) states: “Successful application of low-stress stockmanship enables the rider or range manager to control the duration that plants and soils are exposed to grazing animals. This controls overgrazing and over resting, both of which lead to deterioration of range health. Proper handling can thus improve livestock distribution and rangeland condition and trend, and lead to improved riparian conditions that benefit fisheries and wildlife while improving water quality.”

Regulating livestock use around live water sources and wet meadows by fencing, grazing or herding management to restrict overuse protects vulnerable forbs and grasses for a variety of

wildlife species. However, livestock grazing could periodically be used inside riparian exclosures to reduce old vegetation, thereby exposing and rejuvenating succulent forbs (Evans 1986).

Large amounts of large woody debris from dead and dying trees are expected to continue to accumulate in and along some riparian reaches flowing through forested habitat in the CW. These reaches are primarily located in steep, narrow, forested drainages. Downfall will reduce or eliminate both big game and livestock access to these reaches, resulting in reduced impacts to the vegetative cover and stream banks. However, grazing pressure will increase proportionately on near-by accessible areas. Increased woody debris will also increase step pool habitat and sediment storage and deposition zones.

Additional fuel loading within these steep, narrow drainages will increase fire severity in these areas. In addition, beetle kill areas in these drainages are more susceptible to wildfire, specifically while they have red needles. Sediment storage would be released very rapidly in the event of a wildfire causing excessive sediment deposition lower in the stream system.

Predicted effects of climate change relevant to all issues in this section are described in section 3.3.1.

Issue #2: Upland and Sagebrush Steppe Habitat

The Upland Health Standard in 33 of the 36 allotments in the CW is being met under current livestock management. Three allotments including Morton Individual SGC, Rody Individual and Red Rock are not meeting the Upland health standard and current grazing management is contributing to them not meeting the standard. Because the upland health standard was met, no changes to the terms and conditions of 33 grazing permits will be implemented based exclusively on the condition of the upland habitat. The health of the uplands and associated upland species, including sagebrush obligate species, is expected to remain in PFC in these areas.

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

In the absence of wildfire, conifer expansion will continue resulting in a reduction in mountain big sagebrush and three-tip sagebrush vegetative communities. This will affect vegetative (composition, age class, seral state) diversity along the south side of the valley. Conifer expansion and its effect on Forest and Woodland Health is discussed in more detail in section 4.2.2, Issue #3.

Removing, modifying, or rebuilding BLM fences and fences bordering BLM lands will enhance wildlife and bird movement through the area and reduce entanglement and collision hazards. Modifications will be made to existing fences not meeting BLM specifications, which will reduce barriers to wildlife movement and mortality. Modification of wildlife barrier fences will improve seasonal movements by elk, mule deer, moose and antelope in specific areas within the watershed, particularly for young of all species. Adjusting wire spacing, removing wires or providing gaps will allow animals to pass over or under these fences with a reduced risk of entanglement. Installing wildlife escape ramps in water developments enhances the ability of birds, bats, and other small mammals to get out of water developments and avoid drowning.

Sagebrush vegetation monitoring data collected during 2014 averaged 36% canopy cover (cc) of sagebrush and shrub height averaged 28cm. Herbaceous cc averaged 55% and 11 cm in height. The canopy cover and heights of shrubs and herbaceous vegetation is highly variable based on species composition and soil types. In areas where the sagebrush canopy exceeds 30% with regeneration of sagebrush, herbaceous heights may not play as important role for hiding cover. Yearly counts of displaying males on leks in the CW have remained relatively stable in the past 10 years and in 2014 and 2015 the average males per lek was the highest since 2007. Several potential new leks have been identified in the CW in the past few years by the BLM and TNC. Based on the allotment vegetation studies summarized above and the IDT field inspections, none of the sagebrush obligate species that rely on sagebrush to fulfill all or part of their life cycle would be impacted by the proposed alternatives. Refer to appendix D for more information on impacts to Special Status Species that occur in sagebrush steppe habitat.

Issue #3: Forest and Woodland Habitat

Public use of wood products on BLM administered lands outside of the Centennial WSA will result in the removal of dead/dying materials within 300 feet of existing designated open routes. Impacts of personal-use firewood gathering will be minimal. Slashing stipulations may be required in addition to the existing stipulations and regulations required by the permit. Prescribed burning of slash piles may be required to reduce slash concentrations in areas of frequent use.

Permits for Christmas trees will be issued for the removal of small size-class trees. Impacts to resources from Christmas tree harvesting will be minimal. On a very small scale, the removal of these smaller trees will make progress towards meeting management objectives to create more resilient forests, and by removing young conifers that are expanding into sagebrush/grassland and aspen habitats.

Mountain pine beetle activity will continue under all alternatives including the no action. As suitable host trees decline, the beetle population will also return to endemic levels. Young, small-diameter lodgepole pine will not be susceptible to mountain pine beetle attack until the trees reach maturity. Throughout the CW, 5-needled pines (limber pine and whitebark pine) will continue to decline due to mountain pine beetle and/or white pine blister rust and may become nonexistent in some areas. Management strategies to reduce white pine blister rust are cost and labor intensive (Hagle et al, 1989). Information on treatment methods shown to effectively promote limber pine and reduce mortality from white pine blister rust are very limited (Schoettle, 2004). Where pheromones are applied, individual and/or groups of 5-needled pines (limber and

whitebark pines) that are suspected to be blister rust resistant will be protected from bark beetle infestation.

Douglas-fir, subalpine fir, and spruce will continue to be defoliated and damaged by western spruce budworm. Heavy defoliation will predispose mature Douglas-fir trees and stands to future Douglas-fir beetle infestation. Douglas-fir beetle activity is present within the CW but is at or nearing endemic levels and is likely to remain so. Mature Douglas-fir trees will continue to be lost as a result of drought, defoliation, and bark beetle infestation. In the absence of wildfire, conifer expansion into sagebrush communities and aspen will continue across all ownerships.

Collecting cones from individual five needle pine trees (limber and/or whitebark pine) that are suspected of being blister rust resistant would contribute to the genetic breeding program, and could help the long-term sustenance of these species on the landscape. Applying pheromones to selected areas will deter bark beetles from attacking mature trees. This will protect valuable individual trees, as well as their genetics, to persist on the landscape as an important feature of forest and woodland habitats.

Issue #4: Special Status Species Habitat

The only Federally listed Threatened wildlife species that occurs within the CW is the grizzly bear. Greater sage grouse are listed as a Candidate species and addressed under Issue #2 above. A short form Biological Evaluation (BE) for Special Status Fish and Wildlife Species (Appendix D) provides a summary of whether or not special status fish and wildlife species are affected by the proposed alternatives and potential impacts. Potential site-specific impacts to special status wildlife species are included in the allotment discussions below where appropriate. A discussion on whitebark pine can be found in Issue #3 above.

Amending grazing leases to say that livestock losses may occur from grizzly bears or wolves will create awareness and minimize conflicts between lessees and agencies responsible for managing the large carnivore populations. Range riders may also reduce conflicts between livestock and wolves (Smallidge et al., 2008). None of the alternatives would impact BLM sensitive status wildlife species and lead to a downward trend in populations and toward Federal listing.

Continuation of stream temperature monitoring will provide long term data on monitored WCT streams. This data would be used to track any changes in stream temperature related to climate change, changes in land use or affects from completed projects, such as the Bean Creek riparian conifer treatment. This data would allow managers to identify drainages that could act as thermal refugia for cold water species should climate change alter stream temperatures beyond preferred thresholds.

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

Resource Concern #1: Noxious and Invasive Species

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

Resource Concern #2: Socioeconomics

The BLM does not have access to financial or business records for public land users authorized to graze livestock on allotments included in this EA. Therefore, it is impossible to provide a detailed or quantifiable discussion of individual ranch operations or economic conditions. The 2015 BLM AUM cost is \$1.69 and an additional \$7.46/AUM surcharge for grazing cattle owned by another operator on BLM administered lands. Private non-irrigated land lease rates in Montana for 2015 range from \$22 to \$26 per animal unit or cow/calf pair.

Current trends in the livestock and timber markets and associated expenses will continue. Economic impacts to businesses and commercial outfitting operations in the area are not expected to be affected from recreation in the CW by any of the alternatives.

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

Resource Concern #3: Wildland Urban Interface

There is a sparse population in the Centennial Valley and residential development is limited and few new residences are expected during the life of this EA.

A cooperative effort between the United States Fish and Wildlife Service Red Rock Refuge, Montana State DNRC, BLM and the town of Lakeview has aimed at reducing the risk of wildfire impacting the town of Lakeview. Fuel reduction projects in proximity to Lakeview on the Red Rock Refuge, Montana State DNRC and BLM lands have made the occurrence of wildfires spreading through the town of Lakeview less likely. Much of these fuel reduction efforts have been funded through County assistance agreements.

In areas away from Lakeview, Montana, fuel loading would continue to increase at all elevation zones across the watershed. High fuel loads in proximity to limited residential development on private lands and near essential access routes would increase the cost and decrease the effectiveness of wildfire suppression efforts. High fuel loads near ingress/egress routes would also affect emergency evacuation procedures.

The management of naturally occurring wildfire in the Centennial Mountains WSA will continue as defined in the Dillon RMP and Dillon Fire Management Plan. Fire is desired in this area and may be managed to improve vegetation and watershed condition. Suppression action will be initiated on fires that do not fall within defined parameters or are a threat to public safety or private property.

Resource Concern #4: Cultural & Paleontological Resources

The BLM will continue to focus on preservation and protection of cultural and paleontological resources to ensure they are available for appropriate uses by present and future generations. The BLM will continue to reduce imminent threats from natural or human-caused deterioration, or potential conflict with other resource uses, by identifying areas for new field inventory. The BLM will also continue to ensure that all authorizations for land and resource use avoid inadvertent damage to federal and nonfederal cultural and paleontological resources in compliance with Section 106 of the National Historic Preservation Act and the Paleontological Resource Protection Act.

Resource Concern #5: Recreation and Travel Management

Recreational uses would continue to occur as they have historically within this area under all alternatives. Although there would be some minor changes to certain designated motorized travel routes under the action alternatives, most of those proposed changes reflect corrections to mapping errors and/or designation of routes most commonly used by the public for recreation.

Resource Concern #6: Visual Resource Management

Any changes to the visual characteristics of the landscape in the planning area would be consistent with the Visual Resource Management objectives. With or without the vegetation treatments proposed in the action alternatives, the characteristic viewshed would change over time as the timber is impacted by insect and disease activity. With no management actions, affected stands of timber would gradually change in color from dominantly green to reddish, brown, and gray. The visual resource management classes within this watershed range from Class I – III. Because the alternatives vary in the proposed projects, specific analysis of the impacts to visual resources will be addressed within the individual alternative analysis.

Resource Concern #7: Wilderness Characteristics

Wilderness characteristics within the Centennial Mountains WSA would continue to be maintained. The WSA is managed in accordance with BLM Manual 6330, *Management of BLM Wilderness Study Areas*, to ensure that wilderness characteristics are maintained or improved until such time as Congress can make a final determination on whether to designate the area as wilderness, or release it from further consideration. Because several projects are proposed to occur within the WSA in different alternatives, the specific analysis of the consistency of those projects with the policy will be addressed in the various alternative analyses.

Lands adjacent to the WSA near the Price-Peet Road were also determined to possess wilderness characteristics. Although there is no requirement to manage these lands to maintain those characteristics, there are no projects proposed in that area in any of the alternatives that would negatively impact those characteristics.

Resource Concern #8: Air Quality

Air quality in the planning area is generally excellent. Wildfires from outside the planning area can produce short-term adverse effects on air quality in Centennial Valley. Air quality and visibility can deteriorate due to temporary air stagnation during wildfire events, which are most common during the months of July, August, and September.

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

Issue #1: Riparian, Wetland and Aquatic Habitat

The No Action Alternative would not meet riparian, wetland, or aquatic habitat objectives along stream reaches and/or at springs where resource concerns were identified. The riparian issues or concerns identified by the IDT and documented in the CW Assessment Report would not be addressed or mitigated. The effects of current livestock grazing practices on the riparian areas would be perpetuated because the current grazing practices in the affected allotments would be continued.

Five grazing allotments did not meet the Riparian Health Standard; Antelope Peak, Fish Creek, Long Creek AMP, Morton Individual SGC and Red Rock. Two other allotments, while meeting the riparian standard overall, had some site specific riparian health concerns (Peet Creek and Shambo Units allotments). Livestock grazing was determined to be a casual factor contributing to impaired riparian function. A variety of impacts were noted by the IDT, including, the alteration of stream morphology (i.e., channel shape and gradient), vegetative composition, vigor, structure and cover, and/or excess sediment inputs. Where resource concerns were found, negative impacts from ungulate trampling to wet meadows would continue and ecological functions would continue to be degraded in these areas. Riparian vegetation would continue to be impacted by ungulate browsing on palatable woody species resulting in limited recruitment and regeneration.

Under the No Action alternative, no management changes would be implemented. Therefore, site-specific objectives would not be met and these five allotments would continue being out of conformance with the Standards for Rangeland Health (43 CFR 4180). In addition, no new stream crossings (culverts), road improvements or projects (fences, water developments) would be initiated to address concerns on stream reaches that did not meet the Riparian Health Standard.

Current trends and conditions of fish habitat would continue under the no action alternative. Habitat conditions on streams not meeting habitat requirements, such as West Creek, would not be expected to appreciably improve over the life of this plan. Fishery habitat in an upward trend or PFC condition such as found in the majority of fish habitat would be expected to continue to improve or stabilize in PFC condition. Habitat concerns such as riparian conifer expansion and site specific issues related to livestock would not be addressed and would continue to have impacts to fish and aquatic habitat.

Under the No Action alternative, wildlife habitat in some riparian areas would continue to be affected by reduced vegetative and woody cover, vegetative species composition, and structural diversity. For example, decreased aspen, willow and sedge dominated communities limit biodiversity by reducing habitat available for fish, amphibians, migratory birds, nesting waterfowl, and browse for wild ungulates. The quality and quantity of sage grouse brood rearing habitat would be reduced on the Antelope Peak, Fish Creek and Long Creek AMP allotments due to riparian standards not being met and continuation of existing trends.

Issue #2: Upland and Sagebrush Steppe Habitat

Existing conditions and trends in sagebrush and upland habitats would continue under this alternative. Along the south side of the watershed (Centennial mountains), conifers are expanding into sagebrush steppe habitat (mountain big and three-tip sagebrush) and that trend is expected to continue. Overall the mountain big sagebrush community in the CW is slightly departed from reference conditions due to fire exclusion and conifer expansion. The proportions of mid- to late-development mountain big sagebrush are near reference conditions, however the early development sagebrush component is lacking throughout the watershed. Douglas-fir is establishing in areas historically occupied by sagebrush and are converting those areas into forested habitat.

As stated in Hyerdahl et al. (2006), “in the continued absence of fire, mountain big sagebrush and grasslands in southwest Montana are likely to become more homogenous as Douglas-fir trees continue to encroach.” Without any natural or human caused disturbances some areas currently occupied by sagebrush and scattered conifer seedlings would be converted to a forest cover type within approximately 30 years. Continued conifer colonization is expected in the area of the Corral West fuels unit. The 262 acres of conifer removal would not be implemented and existing late seral mountain big sagebrush habitat would eventually be converted to Douglas-fir forest and no longer provide for sage grouse summer habitat. Once the mountain big sagebrush/Idaho fescue habitat type is converted to Douglas fir the understory vegetation is substantially reduced and less resilient to recovery after wildfire. These areas of Douglas-fir expansion are much more susceptible to invasion by cheatgrass and other noxious and invasive species following wildfire than mountain big sagebrush/Idaho fescue habitat.

Continuation of current grazing practices on the three allotments that failed to meet the Upland Health standard, Morton Individual SGC, Rody Individual and Red Rock, would not address documented upland health issues. Some of the upland conditions noted in the CW Assessment Report, December, 2014 (http://www.blm.gov/mt/st/en/fo/dillon_field_office.html) are: water flow patterns that are slightly longer than expected, minor erosion and soil instability, slight active pedestalling in the flow patterns, increased bare ground causing increased litter movement and/or presence of noxious and invasive species.

Issue #3: Forest and Woodland Habitat

Under the No Action Alternative, zero acres of forest and woodland cover type would be commercially harvested. Current conditions and forest trends would continue until interrupted by natural events (e.g. wildfire, windthrow), insects and disease, and/or changes in weather or climate. Fuel loading as a result of insect/disease-killed conifers would increase at a natural rate (i.e. remain unaffected by commercial salvage harvest).

Remaining mature lodgepole pine trees would continue to be killed by mountain pine beetle. Where lodgepole pine trees have died in and around aspen stands, aspen are expected to benefit through increased vigor due to increased sunlight, water, and nutrients. The vigor, condition and health of understory plants would also improve with increased light, moisture, and nutrients. Beetle-killed trees would fall to the ground over the next five to fifteen years, contributing to the fuel load available to wildfire, soil nutrient cycling, and wildlife habitat. The behavior and effects of wildfire within stands of beetle-killed trees is the subject of current research. Time

since the beetle outbreak affects the type and arrangement of fuel available to fire, and the corresponding surface fire properties and crown fire potential. Other environmental factors (i.e. windspeed, temperature, long-term drought) play an equally important role in influencing fire behavior and severity.

High density Douglas-fir and mixed conifer stands have high hazard ratings for western spruce budworm and Douglas-fir beetle. The continuation of spruce budworm activity would result in additional defoliation, reduced growth and predisposition to attack by other insects and diseases. Repeated defoliation by spruce budworm may result in top-killing and tree mortality (Fellin and Dewey, 1986). The continued spruce budworm activity in the CW would allow for “natural” thinning of the Douglas-fir forest which would reduce densities towards more historic stocking levels. However, defoliation by spruce budworm would also weaken trees and make them more susceptible to bark beetles. This increased susceptibility, in combination with suitable stand conditions, may cause Douglas-fir beetle activity to increase. During Douglas-fir beetle outbreaks, large-scale tree mortality can cause substantial economic losses, degradation of wildlife habitat, increased wildfire risk, and diminished aesthetic values associated with forests (Dodds et al., 2006). In outbreak conditions, groups of dead trees may total 100 or more and yearly mortality may extend into the millions of board feet.

Mountain pine beetle and white pine blister rust would continue to cause mortality of limber and whitebark pine. The remnants of intact whitebark pine stands are at high risk of loss due to reduced seed sources and lack of disturbance required for the promotion of successful regeneration. If whitebark pine is extirpated from these areas, they may either be replaced by subalpine fir, or the areas may remain bare due to the harsh environment from which this species is found. The prostrate growth form of whitebark pine provides shade and results in a decreased rate of snowmelt beneath the tree. Further losses of whitebark pine would also reduce the snow holding capacities in high elevation sites where it is found (Tomback et al, 2001).

Without disturbance (fire or mechanical) the loss of aspen caused by conifer expansion and conversion to conifer forest type is anticipated to continue. Insect-caused conifer mortality will create openings in the forest canopy allowing more sunlight to reach the forest floor. Aspen will respond favorably to more sunlight on a localized basis. Within aspen restoration treatment areas, where conifers have been cut and/or girdled, existing aspen clones are anticipated to respond to the increase in sunlight by suckering and clone expansion.

Issue #4: Special Status Species Habitat

See whitebark pine discussion in Issue #3 above.

Monitoring data indicates that current management overall is meeting the requirements for WCT. Localized habitat concerns on stream reaches impacting habitat, such as riparian condition on a tributary to East Fork of Peet Creek and conifer expansion concerns in Bean, Bear, Peet and Price Creeks would not be addressed. This habitat would be expected to remain static or decline over the life of this plan. Fishery habitat in an upward trend or PFC condition such as found in the majority of WCT habitat would be expected to continue to improve or stabilize at current condition.

Sagebrush cover requirements are being met for sagebrush-obligate species on all allotments in the CW except the Rody Individual and Red Rock allotments. To achieve sagebrush habitat requirements, allotments must meet the upland and biodiversity standard. Under Alternative A, habitat conditions for sagebrush-obligate species are expected to continue to be met on those allotments meeting the standard. The Rody Individual and Red Rock allotments are mapped within PPMA for sage grouse. However, habitat within these two allotments are not known to provide nesting or winter range for sage grouse and make up less than 1% of the sagebrush on public lands in the CW. Continuation of existing management would not improve habitat conditions the Red Rock and Rody Individual allotments. These two allotments are a very small portion of the overall sage grouse habitat in the CW and would not be expected to contribute to a decline in sage grouse population numbers. Habitat found on the Morton Individual SGC allotment is not sage grouse suitable habitat but is grizzly bear habitat; however the habitat conditions on this allotment are not impacting grizzly bears from expanding into suitable habitat.

The allotments not meeting riparian health standard and that have suitable sage grouse habitat are; Antelope Peak, Fish Creek and Long Creek AMP. These three allotments would not meet sage grouse brood rearing requirements and this trend is expected to continue. Special status wildlife species are expected to persist under the no action alternative as current management is not having any significant measurable negative effects. Habitat monitoring would continue on BLM managed public lands as described in the Monitoring Plan in Appendix B. For more information on SSS wildlife refer to the CW Wildlife Biological Evaluation in Appendix D.

Three of the six sensitive plant species within the CW would be expected to persist under the no action alternative. Populations of these species would be monitored as described in Appendix B, and this monitoring would provide baseline and trend data for the known populations on BLM lands. Three of the six plants, Fendler cat's-eye, painted milkvetch, and sand wildrye found in the Centennial sand dunes, would be expected to gradually decline as perennial, late seral vegetation colonizes areas that were formerly open sand.

Resource Concern #1: Noxious and Invasive Species

Two of the allotments, Rody and Red Rock, which did not meet the upland health standard had noxious weeds (Canada thistle, knapweed, houndstongue) which contributed to the impaired function of the uplands. Continuation of current grazing practices on these two allotments is expected to maintain current conditions of reduced vegetative diversity and increased bareground which facilitates noxious and invasive species spread. This makes controlling noxious weed more difficult and could lead to an increase in the size and/or density of existing noxious weed infestations as well as an increased probability of the establishment of new invasive species in unoccupied areas.

Resource Concern #2: Socioeconomics

Under Alternative A, forage availability and number of authorized AUMs would continue at current levels. Economic benefits attributed to livestock use of BLM administered lands would remain unchanged. Livestock grazing on about 75,000 acres of public lands would provide approximately 10,300 AUMs of forage on 36 grazing allotments in Beaverhead County. The dependency of livestock operators on BLM forage would remain unchanged. Because

authorized grazing use on public land allotments would remain static, the real estate values of private base properties would not be influenced by BLM actions.

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

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

Resource Concern #3: Wildland Urban Interface

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

Resource Concern #5: Recreation and Travel Management

Under the No Action Alternative, recreation and travel management activities would continue to occur as they have historically. Incorrectly mapped travel routes would continue to be shown on the most commonly used published travel management map for the area (currently the Beaverhead-Deerlodge National Forest map). Visitors would continue to be confused by these maps, and would continue to use routes they believe to be designated open, as well as some they know are not.

Resource Concern #6: Visual Resource Management

Ongoing activities would continue to be consistent with management of visual resources as no noticeable changes would occur in the short term, and changes in the character and color of timbered lands would slowly change over time.

Resource Concern #7: Wilderness Characteristics

Wilderness characteristics would continue to be maintained as lands within the Centennial Mountains WSA continue to be managed in accordance with BLM policy mandating the protection of those characteristics until Congress acts on either designating as wilderness or releasing the area from further consideration as wilderness. In all likelihood, wilderness characteristics would continue to be maintained even if the area were released by Congress from further consideration because similar future management is provided for in the Dillon RMP even after it is released.

Resource Concern #8: Air Quality

Under the no action alternative outside factors affecting air quality would remain static. Fuel loading would continue within the Centennial Watershed with no treatments and when a wildfire does occur would likely burn a larger area and burn more severely which would have a greater effect to air quality during the burn event.

4.2.3 Climate Change

Predicted effects would be the same as described in Section 3.3.1.

4.2.4 Predicted Effects Common to All Action Alternatives

Issue #1: Riparian, Wetland and Aquatic Habitat

Revised grazing systems, included in all the action alternatives, were developed in conjunction with the grazing operators in an effort to increase cooperative implementation and success in meeting resource objectives. Ehrhart and Hansen (1997) concluded that successful management of riparian areas is a reflection of operators' efforts to discourage livestock loitering in the riparian zones, and that active management is more important than either season of use or length of time in the pasture. A subsequent paper by Ehrhart and Hansen in 1998 acknowledged that there are "numerous techniques available for developing and implementing an appropriate prescription to address any given riparian ecosystem." The only required ingredient which portends potential success was "serious commitment and personal involvement on the part of the operators and managers." Alternatives developed in consultation with affected lessees have an improved chance for success.

Revised livestock management is predicted to improve riparian vegetation, stream channel morphology and sediment transport at varying degrees and timeframes in relation to the No Action alternative. Where additional rest is incorporated into grazing systems, recovery is expected to improve proportionately. Wyoming Game and Fish Department published a report which included pre and post exclusion photography which documents the improvements in condition associated with livestock exclusion and short duration grazing (Jellison et al., 2007). Recovery was observable in many cases over the five year interval between photographs. Results were not as favorable where the floodplain had become disconnected from the channel.

While different opinions exist within the scientific community regarding the best season of use, there is consensus that the length of time animals spend in a riparian area can be a significant factor in the condition of that area. According to Marlow and his colleagues (1991), "The most critical aspect in any grazing plan for the protection of riparian areas is the length of time cattle have access to a particular stream reach." Extended grazing during the hot summer season is generally considered most injurious to riparian zones. Therefore, wherever the alternative includes reducing the amount of time that cattle have access to riparian areas, impacts are predicted to be reduced.

Channel adjustment recovery is expected to lag vegetative recovery (Kondolf, 1993). Exclosure research over three decades has been conducted in an effort to predict recovery rates of riparian systems under revised management (Saar 2002). Drawing conclusions based upon this research has been problematic. Sarr discusses scientific uncertainty, research assumptions and interpretive challenges, "riparian systems may show very different recovery trajectories..." We expect that revised livestock management would improve riparian vegetation and stream channel morphology and that where thresholds have not been crossed, changes would not be irreversible. Deep rooted riparian vegetation, unless overgrazed, will recover from grazing. Willows, likewise, unless over browsed will recover. Stream morphology is more problematic. Channel recovery typically lags riparian recovery (Cowley 1997). For overwidened streams to develop

the patterns, profiles and dimensions of self-maintaining streams, bank building must occur. Vegetation must capture sediment and channels must narrow. At times channels must undergo an evolution including unstable channel types before a stable channel returns (Rosgen 1996). Recovery depends on the magnitude and frequency of flooding. Given the uncertainty surrounding channel recovery, it is difficult to predict the effects and timeline of recovery to specific stream reaches, but some improvement is expected in all stream types where livestock grazing revisions are proposed.

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

Improving riparian health is expected to have a beneficial impact on wildlife and fisheries habitat by increasing forage and security cover as well as reducing sediment input into streams. Forbs are an important summer food source for sage grouse broods. Later in the summer, as palatability of forbs declines, sage grouse move into moist areas that still support succulent vegetation, including wetland and riparian areas. Revising livestock grazing to improve riparian conditions would benefit all wildlife species that utilize riparian habitats. This is especially true for sage grouse during brood-rearing when forbs and insects are essential to their diet.

Fishery habitat is tied to riparian habitat conditions. Implementing management changes with the goal of improving riparian conditions will in nearly all cases improve fishery habitat. For fish streams not in PFC, changes in management are expected to improve habitat. Improvements would include increases in riparian vegetative diversity and cover, a reduction in bare ground, stabilization of stream banks as well as a decrease in the level of localized sediment input via improved bank vegetative stability and cover. In-stream sediment issues may continue where conditions upstream continue to contribute sediment. As that sediment moves through the stream system it will continue to influence stream conditions downstream of the point source. Construction of sediment traps, such as the proposed beaver mimicry structures, would allow for the capture of this sediment, for at least the short term, in areas of proposed streams with entrenchment impacts. As sediment is trapped behind the structures (aggradation), the localized water table would rise, reconnecting the stream to its floodplain. This would allow for increased deep rooted vegetation such as sedges and willows, which in turn would improve the bank stability. Water storage capability would increase in localized areas of the stream (directly above the dams).

Re-locating beavers into drainages with appropriate vegetation allow beavers to persist for the short term would have a similar effect as described above. Where beaver dams are constructed, aggradation of the stream would occur, riparian areas would widen and wetland areas would increase on a localized basis. Deep-rooted riparian vegetation would increase and banks would become more stable. The area of stream affected by beaver dams would store more water and this water would be available later in the season.

The BLM has a historical easement from the Montana DNRC near Wolverine Creek which allowed the public to travel from the main north Centennial Valley road up to privately owned land in Section 7 (See Appendix A, Map #4). Although BLM had no access easement for the public to cross private lands where the easement terminated, the public has been trespassing across private lands in an effort to access BLM and Montana DNRC lands to the north in sections 6 and 5. The historical easement that BLM obtained from Montana DNRC also had negative impacts on wetland habitat as it crossed several wet areas which made the road often impassable without doing damage to the wet areas and often stranding the public. Recently, BLM obtained a separate easement from Montana DNRC that would replace the existing Montana DNRC easement that terminated at the private lands. This new easement (See Map #4) would follow drier, non-sub-irrigated ground and tie into BLM and Montana DNRC lands to the north rather than terminating at the private lands. The new road easement is on drier ground so this would benefit the riparian/wet areas where the previous easement crossed. We predict fewer impacts to the wetlands that the roads crossed and more use by the public.

The Fish Creek allotment's main east/west road is often impassible because it crosses Fish Creek or its tributaries in several places (See map #6). Where the road crosses Fish Creek, sediment is sent into the stream and vehicles often get stuck sending even more sediment into the stream. Four new culverts would be placed in places where the road either crosses Fish Creek or its tributaries or where water collects and makes the road impassible. These culverts would reduce the sediment entering the stream and make the road more recreationalist friendly. We predict that there would be some short term sediment increases as the culverts are installed but once the culverts are installed, sediment input into Fish Creek would be substantially decreased. Channel migration is a natural phenomenon and there may come a time when these culverts fail due to channel migration, however that is not expected within the lifetime of this EA.

Commercial forest harvests and non-commercial mechanical/prescribed fire treatments would take place in the Shambo Units, Price Creek, Fish Creek, Long Creek, Tom Creek, Morton Individual and Peet Creek allotments (see Appendix A, Map #2). Non-commercial mechanical/prescribed fire treatment boundaries may include riparian areas. Prescribed burns are not expected to affect the riparian areas although the burn may enter the greater riparian area with low intensities during holding operations.

Negative effects of the burn on riparian areas are not predicted because prescribed burns are planned in the early spring and later fall periods. During this time period, fire intensities are lessened due to shorter burn periods, lower daytime temperatures and typically higher fuel moistures. The exception may be in the fall when fuel moistures are similar to summer fuel moisture conditions. However, if fuel moisture is low in the fall burn period, the prescribed burns would be implemented with appropriate weather conditions and identified objectives as

outlined in the project specific burn plan. Additionally, adequate vegetative buffers would be planned between the burn units and the streams to mitigate short term sediment input in the riparian areas.

Commercial harvest unit design features would follow Montana Forestry Best Management Practices and the State of Montana Streamside Management Zone (SMZ) laws and rules as discussed under section 2.3.3 in Features Common to All Action Alternatives. Because these guidelines would be followed, we don't expect any long-term impacts to riparian areas when conducting a timber sale.

Issue #2: Upland and Sagebrush Steppe Habitat

Utilization of key forage plants (e.g. bluebunch wheatgrass, Idaho fescue, needle and thread) on the majority of BLM lands in the CW was found to be less than 50%. For those areas where site specific concerns were identified, limiting use of upland forage to 50% during seasonal grazing would benefit water infiltration, plant vigor, reduce soil loss from erosion and leave adequate residual cover and forage for wildlife. Moderate use would also enhance herbaceous plant community cover and composition. Increased cover improves precipitation infiltration and subsequently decreases soil lost via wind and water erosion. Sediment delivery to near-by streams would also be reduced. Grazing earlier in the season would allow sufficient time for plant re-growth while later deferred treatments enhance seedling establishment and species composition. Deferring livestock use until after the growing season mitigates grazing impacts to cool-season bunchgrasses and reduces trampling of forbs.

Water troughs, mineral placement, and trailing along fences would cause some incidental localized impacts to vegetation and soil compaction. The proposed water development is designed to improve livestock distribution and is expected to change utilization patterns so that more use occurs on upland forage plants and less in the riparian areas. New livestock water troughs may also provide increased water for wildlife if they are available when livestock are not present. Soil compaction and loss of vegetation is expected in the immediate vicinity of the new water trough and increased forage utilization can be expected within ¼-mile of the troughs due to concentrated livestock use within close proximity to these watering locations. Cleaning up the old fences that were not maintained in the Rody individual and Curlew allotments would remove entanglement hazards for all wildlife, especially big game. Re-building the fences to BLM specifications would minimize the risk of collision and entanglement but not remove them.

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

The Red Rock and Rody Individual allotments would be seeded to a native seed mix where needed to help establish native vegetation where many invasive and noxious weeds exist. The native seed would be seeded during the rest year so plants can become established without herbivory from livestock. The native plants, once established would be able to compete with non-native plants which would provide better habitat for wildlife while maintaining ecological function of soils including: nutrient cycling, soil stabilization and help with ground water recharge.

The CW is comprised of 347,543 acres, 59,840 acres of which are classified as forest, 189,320 as Sagebrush/Shrub/Steppe and 28,730 as grassland cover type (2015 Centennial Watershed Assessment Report page 16). Non-commercial mechanical/prescribed fire treatments include up to 5,205 acres (Alternative B) and up to 8,850 acres (Alternative C), approximately 1.4% and 2.5% (respectively) of the total acres in the CW. Non-commercial mechanical/prescribed fire treatments would focus on increasing seral/age class diversity, maintaining Douglas-fir savannah in existing harvest units, promoting five needle pine regeneration, reducing conifer expansion into sagebrush/grasslands, and promoting aspen regeneration. Re-introducing natural disturbance regimes i.e., prescribed fire, would result in a mosaic of plant communities and diversity of successional stages in sagebrush habitats. Treatments to reduce conifer expansion into mountain big sagebrush and three tip sagebrush would result in short-term change within sagebrush habitat, converting these sagebrush/forested areas to early seral stage sagebrush habitat with a grassland aspect and a minor forest canopy. Recovery of sagebrush habitat would facilitate the BLM's goals and objectives of maintaining and improving sagebrush/grassland habitat. Based on past prescribed fires in the watershed, it would take 20- 30 years to move through early and mid seral stages to get back to current sagebrush cover, seral and structural diversity within sagebrush habitats across the landscape. By creating a mosaic of age classes in the sagebrush canopy, more edge is created. Removing the conifer expansion would maintain this seral and structural diversity of the sagebrush steppe habitat for up to 30 years (Lesica, Cooper and Kudray 2007).

These prescribed fire treatments would also affect livestock grazing. Increased palatability and abundance of forage for both wildlife and livestock following prescribed fire would shift more use to burned areas and proportionately less use in non-burned areas within the allotments for up to five years following the treatments. The design features listed in chapter 2, require grazing rest one year prior and two growing seasons post any prescribed fire treatment. Disturbance within the treatment areas have the potential to facilitate the spread and/or introduction of noxious and invasive species. Design features in chapter 2, also include protocols for locating and treating any invasive or noxious weeds both pre and post prescribed fire. Also see Resource Concern #1: Noxious and Invasive Species. These design features would mitigate the expansion or introduction of noxious and invasive plant species as a result of these treatments.

The proposed prescribed burns may result in short term air quality deterioration. The BLM is a member of the Montana/Idaho Airshed Group and coordinates with the Montana DEQ to prevent/reduce the impact of smoke on communities and other areas with smoke impact restrictions, especially when it could contribute to a violation of national air quality standards. Coordination with the Airshed Group would be addressed in site specific burn plans prior to any ignition. Also see Air Quality discussion under Resource Concern #8.

Issue #3: Forest and Woodland Habitat

The CW is comprised of 347,543 acres, 59,840 acres of which are classified as forest cover type. Commercial harvest treatments include up to 448 acres (Alternative B) and up to 1,027 acres (Alternative C), approximately 0.75% and 1.7% (respectively) of the total forested acres in the CW. Commercial harvest would salvage trees recently killed by insects and/or disease, reduce the basal area of live trees in overstocked stands to increase the resiliency of the residual stand, and reduce fuel continuity. Increasing the vigor of remaining trees would result in timber stands more resistant to future insect and/or disease outbreaks as well as climate change. Infiltration would be improved as forest canopy is opened, reducing moisture losses due to canopy interception and snow sublimation. Reducing the number of trees per acre would increase the availability of subsurface water to remaining trees and herbaceous vegetation. Data from 95 watershed experiments conducted in the United States shows that, on average, stream flow increases by nearly 2.5 mm for each percent of watershed harvested (Troendle, et al. 2006).

The removal of conifers from within and around existing and remnant aspen stands would increase the amount of sunlight reaching the soil surface, promoting aspen regeneration. Surface soil disturbance associated with ground-based skidding would also promote aspen regeneration. Surface soil disturbance and increased sunlight would increase herbaceous understory vegetation within all forest and woodland treatment areas. There may be a short-term increase in soil erosion within harvested areas, but the long term effect would be decreased soil erosion due to increased cover of herbaceous vegetation. The BLM does not intend to increase authorized livestock use as a result of increased herbaceous vegetation.

The use of temporary roads and/or skid trails to complete harvest activities would result in localized soil compaction within treatment areas. Design features for road construction and maintenance would be followed in accordance with Montana Forestry BMPs and the State of Montana SMZ Law and Rules. Temporary road construction would be to a minimum standard necessary for the removal of products and safe travel operations. Standard timber sale contract provisions address protection measures to reduce soil erosion, sedimentation, and soil compaction. Proactive administration of those contract provisions would minimize unwanted soil disturbance. Limiting operations to frozen or reasonably dry road conditions would eliminate rutting greater than six inches deep. Preventive maintenance at the end of each hauling season would decrease the potential for erosion and sedimentation associated with temporary road construction.

Physically closing roads using berms and slash has proven to effectively prevent use by motorized vehicles. Utilizing right-of-way debris to physically close temporary roads in the Dillon Field Office has been a useful tool for over 15 years with nearly 100% success in prohibiting unauthorized road use. Physically closing new temporary roads would allow for future timber stand management by maintaining the road prism with properly functioning long term drainage features. This would also allow for faster re-vegetation (by not re-disturbing the vegetation that establishes after construction), and would keep post-treatment sediment movement to a minimum.

Disturbance within treatment areas has the potential to facilitate the spread and/or introduction of noxious and invasive species. Weed monitoring and treatment would be ongoing during and

after the use of temporary roads. The contractual requirement to pressure wash equipment prior to entering the project area, as well as completing noxious weed monitoring for a minimum of three years post-harvest, would mitigate the potential for noxious weed spread into the watershed.

Commercial harvest treatments would be implemented in three separate Level 6 hydrologic units identified in Alternative B, and four Level 6 hydrologic units identified in Alternative C. See Table 4.1 below for maximum percentages and acres affected.

Table 4.1 Percentages of Level 6 Hydrologic Units Affected by Commercial Harvest, by Alternative

HUC 6 Watershed Name & Acres	Allotment	Alternative B Proposed Acres	% Of HUC 6 Affected	Alternative C Proposed Acres	% Of HUC 6 Affected
Odell 23,868	Unallotted	268	1.12%	268	1.12%
Corral 27,760	Price Creek	103	0.37%	103	0.37%
Long 29,427	Fish Creek	77	0.26%	77	0.26%
Hellroaring 23,048	Tom Creek	--	0.0%	579	2.5%
Total Proposed Treatment Acres		448		1,027	

The use of broadcast prescribed fire within commercial harvest units post-harvest may be utilized to reduce residual dead/down fuel loading to between five to twenty tons per acre, and to meet silvicultural objectives. Coarse woody debris not consumed by prescribed fire would aid in moisture retention and nutrient cycling. If slash fuel loading is in excess of residual target and broadcast prescribed fire is not planned, slash would be removed from within the unit, piled at landings, and burned. If post-harvest fuel loading is less than residual target, slash may be placed within the harvest unit to ensure adequate nutrient cycling. Where aspen are present within treatment units, prescribed fire may also be used to promote suckering and clone expansion. The placement of slash and other non-merchantable material within and or around aspen stands would help protect aspen regeneration from browsing on a localized basis.

Timing of slash disposal post-harvest varies from less than one, up to several years. Slash piles at landings would be burned when there is sufficient snow present to prevent fire spread away from the slash pile footprint. Prescribed broadcast burning within commercial harvest units may be utilized to reduce slash and fuel loading. During the time period between harvest completion and prescribed burning, the slash fuel loading has the potential to increase unwanted wildfire severity and/or intensity within the harvest unit.

In the long term, the reduction of fuel loading and fuel continuity as a result of commercial harvest, with or without follow-up prescribed broadcast burning, would decrease the intensity and rates of spread of future wildfire within the treated area. Reducing fuels available to wildfire would increase the options available for appropriate fire management strategies and/or improve the effectiveness of suppression efforts.

The salvage of standing dead trees within commercial harvest units would reduce material available for natural biological breakdown and nutrient cycling, and habitat available for some small mammals and nesting birds. However, the removal of standing dead trees would also reduce the potential for soil impacts caused by high temperature, long-duration burning during a wildfire. Within commercial harvest units, the following mitigation measures would lessen impacts to wildlife dependent on standing dead trees: retain at least two to five snags per acre, survey for active goshawk or owl nests, and implement timing restrictions to avoid disturbing nesting activity if they are located within treatment units. Harvest activities would not be allowed during May and June to reduce the conflicts and displacement during the calving/fawning season for elk, mule deer and moose.

Planting whitebark pine and/or limber pine seedlings would promote a new cohort of five-needle pines in areas where acceptable levels of natural regeneration establishment is not occurring (i.e. post wildfire, insect & disease outbreak). Increasing the number of seed producing trees would increase the probability of natural five-needle pine regeneration in the future. Outside of the Centennial WSA, selective cutting of competing conifers in the vicinity of existing natural regeneration would increase woody debris and fuel loading locally, but would not exceed the target of five to twenty tons per acre.

The forested area within the CW not proposed for commercial harvest under the action alternatives (maximum of 98.3%) would be subject to effects similar to those described in the No Action Alternative.

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

Issue #4: Special Status Species Habitat

See whitebark pine discussion in Issue #3 above. Refer to appendix D for a more comprehensive analysis of specific impacts to special status wildlife species.

The proposed riparian conifer treatments would benefit WCT habitat by reducing competition for available nutrients and sunlight allowing for increases in desirable woody and herbaceous vegetation such as sedges and willow. Riparian vegetation directly controls the food chain of the ecosystem by shading the stream and providing organic debris and insects for the streams organisms (Cummins 1974, Meehan et al. 1977). Multiple studies have shown that deciduous/herbaceous habitat types are more productive than equitable coniferous habitat types.

Planting willow and sedge along the Bean Creek riparian treatment would facilitate thus more rapid improvement in riparian vegetation and bank stabilization and reduced sediment input to Bean Creek. This would help improve fishery habitat for WCT in Bean Creek.

Proposed prescribed fire units are unlikely to result in any negative impacts to WCT habitat because the proposed burn units are located far enough from WCT streams to provide an adequate vegetative buffer from any potential sediment runoff. It is likely that they would have beneficial effects through changes in livestock distribution. As new forage becomes available in

burned areas, livestock would be drawn to the treated areas and spend less time grazing riparian areas which would reduce associated impacts.

Impacts to migratory birds would be negligible as the prescribed fires would be implemented outside of the nesting season. Creating diversity and maintaining open Douglas-fir savannah and aspen habitat would be beneficial to species such as the loggerhead shrike and black-backed and Lewis's woodpecker. Only the Corral West burn is proposed in sage grouse habitat, and due to the conifer density in this unit, it is currently deemed unsuitable for sage grouse as over 20% of the surrounding 1,000 acres is forested or is being colonized by Douglas-fir (MT FWP 2009). Davies (2011) recognized the need to reintroduce fire into these higher elevation mountain big sagebrush habitats early on by stating "Priority should be placed on restoring infrequent fires to sagebrush plant communities that are in the early phases of woodland development." "A longer-term view of restoration is needed, where short-term loss of sagebrush dominance to reduce early conifer encroachment is acceptable and practiced where it will not result in a devastating decline in habitat for sagebrush-associated wildlife." (Davies et.al.2011.)

All commercial harvest units would be surveyed to determine presence of nesting raptors and timing restrictions would be imposed during the nesting season if occupancy is determined. Impacts to nesting bald eagles from commercial harvest activities in Corral Creek would be mitigated by requiring timing restrictions during the nesting season.

Changes in the distribution and quantity and quality of cover are not necessarily detrimental to grizzly bears (ICST 2007). The proposed fuels and forestry treatments are not expected to impede bear occupancy or prey base as grizzly bears are opportunistic omnivores. Under the travel management changes, open road density would actually decrease throughout the CW. Under all action alternatives there would be a total of 6.8 miles undesignated that either has no legal easement across other ownerships or were misidentified on the travel plan. However, the re-designation of 2.2 miles of existing closed road in the east Corral creek area could lead to an increase in conflicts with recreationists. The changes in open road density under all alternatives are virtually unmeasurable within the watershed and the open road density will be maintained well under the 1 mile/square mile within the CW. Refer to alternative B and C below for specific changes in mileage for each alternative.

Initial inventory and monitoring of three sensitive plants populations within the CW as well as the ongoing monitoring of the three rare plants in the Centennial Sand Dunes ACEC would/will provide baseline data for future trend monitoring and provide BLM the information to appropriately manage the habitat associated with these rare plant species. The population of the three sensitive species that inhabit the Centennial sand dunes would be expected to increase. The proposed mechanical destabilization of the blow out areas in the dunes would provide the early seral habitat that is preferred for these plant species. This action is outlined in the special management developed for the Centennial Sand Dunes ACEC in the Dillon RMP (page 22 Dillon RMP ROD). These projects are not expected to effect the Great Basin pocket mouse as this species prefers to forage in a mosaic of habitats with a relatively low (<40%) canopy cover and forage on forb and grass seeds. Impacts to nesting migratory bird species is expected to be negligible due to the small size of the disturbances (<1 ac. in size up to 50 ac. total with in the 1040 ac ACEC.)

Removal of two hack towers in the CW is not expected to impact peregrine falcons. The intent of the hack towers was to release peregrines so they could establish natural breeding territories. The removal would be done outside of the breeding season so the returning falcons could relocate upon spring migration. Removal of the hack towers would be consistent with current greater sage grouse management to remove tall structures that assist avian predators in becoming more effective. This would be beneficial to sage grouse during the breeding and nesting season by reducing risk of predation, especially to young chicks. The proposed seeding of forbs on 50 acres within the Antelope Peak allotment would benefit early brood rearing for sage grouse. This would be completed within the unauthorized aerial spraying (2011) where the forb component was lost.

Alternatives that are designed to improve riparian habitat would also improve sage grouse brood rearing, and existing management that is providing adequate seasonal habitat and sagebrush overstory is expected to continue. Refer to Appendix D for more information.

Construction of new fencing in the uplands and to create riparian exclosures would increase the risk of collisions by wildlife. This would be mitigated by adhering to BLM fence guidelines and using three wire fences or jack leg fence for riparian exclosures and 4 wire fences for pasture divisions. No new construction would be within 3 miles of a known sage grouse lek. Any new fence construction that is determined to be in a high use sage grouse area would be marked with flight diverters to reduce collisions.

Resource Concern #1: Noxious and Invasive Species

The treatment of invasive species both before and after prescribed burning and commercial harvest would reduce the probability of expansion of existing infestations or the establishment of new species.

Power washing of equipment before entering a project area would reduce the probability of a new invader being introduced into an area.

Weed education signs placed at the CDT trailheads would educate users in identifying Rush skeletonweed and who to contact if any plants are found. This would reduce the chance of skeletonweed getting established in the Centennial valley.

The additional herbicide treatments in the Red Rock and Rody allotments would help to reduce the size of the houndstongue, spotted knapweed and Canada thistle infestations found there. Also the reseeded in the Red Rock allotment would provide competition and mitigate the re-infestation of treated areas by invasive plants.

Limiting the utilization on upland forage to 50% in the spring and summer as well as the proposed livestock grazing revisions in the Red Rock and Rody allotments would increase the competitiveness of the native vegetation and reduce the spread of noxious weeds.

Resource Concern #2: Socioeconomics

The economy of the state of Montana in general and Beaverhead County specifically are highly dependent on agriculture. Jobs and tax revenue generated by livestock associated activities are

important economic drivers. The alternative or combination of alternatives selected by the BLM Authorized Officer may have a financial impact on an individual grazing permittee and cumulatively on the economic and social fabric of the larger community.

Modifications of use periods in specific pastures or within an allotment, incorporating additional rest or deferment, reducing AUMs and/or reducing numbers of livestock would economically impact ranchers who rely on public land grazing. Authorized AUMs would change in some allotments as shown in Table 2.46, Chapter 2. Operators may have to use private pastures or other areas for longer periods of time. Additional range improvement projects would increase construction and maintenance expenses for the permittees and the BLM in the short term. In addition, use guidelines in the uplands and riparian areas may necessitate increased labor inputs by the permittees (riding) in order to harvest authorized AUMs. During periods or years of drought, total authorized AUMs may not be available for harvest. Providing flexibility in the period of use to adjust to seasonal weather conditions or unforeseen natural events, affecting forage production, may benefit grazing permittees economically by allowing more consistent available forage for their operations.

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

Alternatives B and C propose differing levels of treatment in forest and woodland habitats. Implementing commercial harvest treatments would recover the economic value of the timber resource before it is lost due to mortality and decay. The action alternatives would also create short term job opportunities in the woods and at mills within the region and provide opportunities for public utilization of wood products.

BLM expenditures would temporarily increase under both action alternatives during the implementation period. Socioeconomics was fully analyzed under Alternative B in Chapter 4 (p 331) of the Final EIS for the Dillon RMP. Table 4.2 summarizes the proposed projects on all BLM administered grazing allotments by alternative.

Table 4.2 Summary of Proposed Projects on All Grazing Allotments by Action Alternatives

Proposed Project	Alternative B	Alternative C
AUMs changes (units)	-152	-685
New fence construction, including riparian exclosures/pastures (miles), and fence reconstruction	~9.0 miles 1.0 mi.-Antelope Peak 0.5 mi.-Cocanougher 2.0 mi.-Fish Creek 2.0 mi.-Morton Ind. 0.5 mi.-Peet Creek 1.0 mi.-Red Rock 1.0 mi.-Rody Ind. 1.0 mi.-Shambo Units	~8.0 miles 4.0 mi.-Fish Creek 1.0 mi.-Long Creek 1.0 mi.- Red Rock 2.0 mi. – Morton Ind.
Fence removal (miles)	1.0 mi.-Shambo Units 1.0 mi –Red Rock	None
New spring developments (units)	1-Long Creek	None
New 1,000g troughs (units)	1-Long Creek	None

Proposed Project	Alternative B	Alternative C
New stock water pipelines (miles)	~0.5 mi.-Long Creek	None
Spring exclosure construction (units)	1-Antelope Peak	1-Antelope Peak
Stream crossing installation/replacement (number)	9	10
Treat riparian conifers (miles/acres)	5.5	5.5
Re-designate roads (miles)	Minus 2.3 miles	Minus 1.0 miles
Commercial timber harvest (acres)	448	1,027
Non-commercial mechanical/prescribed fire (acres)	5,182	8,827

Resource Concern #3: Wildland Urban Interface

The management of naturally occurring wildfire in the Centennial Mountains WSA will continue as defined in the Dillon RMP and Dillon Fire Management Plan. Fire is desired in this area and may be managed to improve vegetation and watershed condition. Suppression action will be initiated on fires that do not fall within defined parameters or are a threat to public safety or private property.

The implementation of prescribed fire and/or fuel reduction treatments would reduce fuel loading and create buffer areas to slow or eliminate wildfire spread onto private property. Treatment unit locations were strategically identified to protect private lands near BLM administered land and to provide fire managers maximum fire suppression flexibility. Active management on the landscape scale that includes a mix of thinning, surface fuel treatments, and prescribed fire with proactive treatment in areas with high risk to wildfire is the best general approach for mitigating wildfire damage (Graham et al, 1999).

Air quality impacts relating to implementation of prescribed fire and/or fuel reduction treatments within the Wildland Urban Interface would be short term. The BLM is a member of the Montana/Idaho Airshed Group and coordinates with the Montana DEQ to prevent/reduce the impact of smoke on communities and other areas with smoke impact restrictions, especially when it could contribute to a violation of national air quality standards.

Resource Concern #5: Recreation and Travel Management

Under all action alternatives, mapping errors and minor changes would be made to the designated open routes for motorized vehicles (See Appendix A, Map #4). Designated open and closed routes are being proposed in the Long Creek, Lima Reservoir AMP and Corral Creek allotments. All of the proposed changes would be expected to result in better compliance from recreational users, and discourage users from illegally crossing private lands to access roads that are identified on current maps as open on public lands.

Completing the easement, re-route and culvert installations along the Wolverine Creek road would re-open and provide improved and safer access for the public in this area.

Installing four culverts along the Fish Creek road would improve public access by making this route more usable, more accessible and safer for the public.

Design features associated with route realignment and culvert installation would reduce impacts to wetlands and streams along both the Fish Creek and Wolverine Creek roads.

Resource Concern #6: Visual Resource Management

All of the action alternatives propose activities that would impact visual resources to some degree. All of these activities are considered to be consistent with existing visual resource management objectives for these areas. Specific consideration and analysis of impacts to visual resources are considered within the analysis for each of the specific alternatives.

Resource Concern #7: Wilderness Characteristics

Wilderness characteristics would be maintained in accordance with BLM policy in all action alternatives within the Centennial Mountains WSA and the adjacent area identified as having wilderness characteristics. Because the different alternatives vary, specific discussion and analysis of these impacts is considered within each of the alternatives.

Planting of whitebark and/or limber pine seedlings is proposed in all action alternatives within the Centennial Mountains WSA. BLM Manual 6330 specifically addresses vegetation management within WSAs as follows,

“Whenever possible, natural processes will be relied on to maintain native vegetation and to influence natural fluctuations in populations. Natural disturbance processes, including fire, insect outbreaks, and droughts, are important function of the ecosystem.” (p. 1-33)

However, it goes on to allow exceptions for, among other things, “...federally listed, endangered, or candidate species.” It goes on to elaborate regarding emergencies, where “...there is no effective alternative for controlling insect and disease outbreaks or fires that threaten lands outside of a WSA.” In these situations, it says,

“Reseeding or planting of native species may be undertaken following fire or other natural disaster if natural seed sources are not adequate to compete with non-native vegetation or substantial soil loss is expected.”

The current situation in the Centennial Mountains WSA is that the presence of disease in whitebark pine stands due to the non-native white pine blister rust has reduced the availability of viable seeds necessary for natural regeneration of these historic stands.

Regarding insect and disease control, the policy further states,

“When specific insects and diseases are documented to be non-native or introduced organisms, then it may be reasonable to consider whether the protection and enhancement of wilderness characteristics exception to the non-impairment criteria applies.”

In the case of the current proposed action, planting whitebark pine seedlings that show a demonstrated resistance to white pine blister rust could be a reasonable action to consider in effort to restore historic stands of whitebark pine as well as the natural processes associated their presence, such as a food source for wildlife and snowpack retention.

In relevant part, the policy further addresses this action with regard to “restoration” and “broad-scale landscape function on page 1-34 of the manual.

“The vegetation of some of the landscapes in which WSAs are located has undergone intentional and unintentional human caused transformation during the modern industrialized era. In some cases, these activities have resulted in a departure from the natural composition, structure, and density of native species, with impacts to habitat quality, soil stability, and watershed function.”...

“Where it meets the non-impairment standard or one of the exceptions, management action may be taken to restore vegetation to characteristic conditions of the ecological zone in which the area is situated where:

- I. natural successional processes have been disrupted by past human activity, to the extent that intervention is necessary in order to return the ecosystem to a condition where natural process can function.
- II. restoration through natural processes would require lengthy periods of time during which the impacted area would receive unwanted human use or be susceptible to significant soil loss without intervention, or further ecological departure would occur...”

Transformation of the landscape has occurred through changes to the natural disturbance regimes and the introduction of the non-native white pine blister rust. It follows that these changes in the vegetative makeup of the landscape would also have resulted in incremental changes in the use of the area by wildlife including the Clark’s nutcracker and grizzly bear.

A project designed to benefit westslope cutthroat is a proposal to remove conifers from meadow habitat adjacent to portions of Bean, Bear, Peet, and Price Creeks. This would be accomplished through the use of two people using chain saws and walking through the drainages to remove conifers less than 20” dbh in the meadow type riparian habitat where conifer expansion has the potential to impact existing sedge/willow type habitat. This type of habitat is mostly found in areas of old beaver dams. Removal of the conifers would allow the willows and sedges to be restored and/or maintained in these areas, providing improved soil stability, reduce runoff sedimentation into the stream and maintain high production of macro invertebrates that provide a food source for resident fish species. The project area would encompass a total of approximately 3.4 miles of stream. Actual conifer removal would take place on significantly less area, likely <1.5 miles of riparian area.

Although this proposal is intended to benefit a sensitive species, it is specifically addressed in the section of the BLM Manual 6330 under Vegetation (beginning on p. 1-33). “Manipulation of vegetation through...mechanical treatment...is allowed only where it meets the non-impairment standard or one of the exceptions.”

The first question then is to address whether this action meets the non-impairment standard, which basically provides that the BLM determines whether an action would impair the suitability of the WSA for preservation as wilderness. To meet this standard,

it must be both temporary and not create surface disturbance. Clearly the proposed action would be temporary as there would be no need in the foreseeable future to repeat this action. However, new surface disturbance, by definition (p.1-10) includes any "...new disruption of the rock, soil, or vegetation... that would necessitate reclamation, rehabilitation, or restoration in order for the site to appear and function as it did prior to the disturbance." Although this action would "disrupt" the vegetation, it would not require any reclamation, rehabilitation, or restoration. The intent of the action would be to restore the function that existed in these meadow areas prior to the expansion of conifers, which occurred under unnatural conditions, primarily long term fire exclusion and created further problems in terms of soil stability, stream sedimentation, production of macro invertebrates, and ultimately water quality and native fish populations. Because this action is temporary and would not require any reclamation, it would meet the non-impairment standard, and enhance the wilderness characteristics by improving conditions for the native fish.

Another project proposed to benefit the WCT within the WSA includes construction of "beaver dam mimicry" projects to reduce the sediment levels originating from channel down cutting and erosion in an area of old beaver ponds in East Fork Peet Creek. Construction of the structures would consist of using locally collected material. Hand tools would be used to drive wooden stakes into the stream channel. Smaller diameter willow shoots would then be woven through the stakes to form a "wicker" type weir. The visual impacts of these projects would be minimal. Construction techniques would employ the minimum tool, and access would be by foot. The resultant impact on the wilderness characteristics would be a restoration of more natural conditions and processes with a minor impact to users who could see that a man-made structure had been placed in the stream. Only those in the immediate area of the structure would be aware, and the temporal duration of the impact would be brief for hikers passing by.

Resource Concern #8: Air Quality

Airsheds and Impact Zones in Montana and Idaho closest to the Centennial Watershed are Salmon, Idaho and Butte, Montana to the West and North and Big Sky, Montana and Idaho Falls to the East and South. Red Rock Lakes Wilderness Area and Yellowstone National Park are Class I Federal Areas within and downwind of the Centennial Watershed. Class I Federal Areas require the highest level of protection under the Clean Air Act. The 1998 Interim Air Quality Policy for Wildland and Prescribed Fires required states to develop smoke management plans. Montana and Idaho formed the Montana/Idaho Airshed Group and the Montana/Idaho Smoke Management Program.

Air quality concerns in the planning area are primarily related to smoke. Smoke contributors in the planning area include wildfire, prescribed fires, private debris burning, agricultural burning, slash burning, and wood burning stoves and fireplaces. Wildfire can produce short-term adverse effects on air quality. Air quality and visibility can deteriorate due to temporary air stagnation during wildfire events, which are most common during the months of July, August, and September. Smoke from wildland and prescribed fires is the primary concern affecting human health. Prescribed burning could cause short term impacts to air quality in the Centennial Valley. Prescribed burning is conducted in accordance with the Montana/Dakotas Fire

Management Plan and is coordinated with MT DEQ and the Montana/Idaho Airshed Group. During prescribed fire season, the Smoke Monitoring Unit supports the Montana/Idaho Airshed Group to prevent or reduce the impact of smoke on area communities, especially when that smoke could contribute to a violation of national air quality standards. Burns plans, prepared as an internal document address air quality in a more temporal, site specific manner. During the summer wildfire season, the Smoke Monitoring Unit assists state and local governments in monitoring smoke levels and providing information about smoke to the public, firefighters, and land managers.

4.2.5 Predicted Effects of Action Alternatives related to Climate Change

As summarized in the Climate Change Supplementary Information Report (SIR), climate change impacts can be predicted with much more certainty over global or continental scales. Existing models have difficulty predicting temperature changes at small scales. On smaller scales, natural climate variability is relatively larger, making it harder to distinguish changes expected due to external forcings (such as contributions from local activities to GHGs). Uncertainties in local forcings and feedbacks also make it difficult to estimate the contribution of GHG increases to observed small-scale temperature changes (Climate Change SIR 2010).

It is currently not possible to know with certainty the net changes to climate caused from activities related to improving land health in the CW. The inconsistency in results from scientific models used to predict climate change at the global scale coupled with the lack of scientific models designed to predict climate change on regional or local scales, limits the ability to quantify potential future impacts of decisions made at the HUC 5 watershed level. It is therefore beyond the scope of existing science to relate a specific source of greenhouse gas emission or sequestration with the creation or mitigation of any specific climate-related environmental effects. Although the effects of greenhouse gas emissions in the global aggregate are well-documented, it is currently impossible to determine what specific effect GHG sequestration or emissions resulting from a particular activity might have on the environment.

Healthy forests with a diversity of age classes sequester more carbon than mature, even age, decadent and/or unhealthy stands (overstocked, insects, disease) (Millar et al. 2007). Salvaging forest products from dead/dying timber stands, also adds to our carbon storage capability. “Focusing solely on forest’s sequestration benefits misses the important (and substantial) carbon storage and substitution GHG benefits of harvested forest products, as well as other benefits of active forest management” (Malmsheimer et al. 2011). “Unmanaged forests do not provide additional climate benefits indefinitely. The age when annual forest carbon storage increment begins to decline varies but generally occurs in the first 100 – 150 years as tree mortality losses increase.”

In most of the American West, fire and insects pose a very immediate threat of catastrophic loss of live tree carbon, turning affected forests into carbon emitters” (Malmsheimer et al. 2011). “For more than 70 continuous years, US forest cover has increased and net growth has exceeded removals and mortality. Therefore, carbon storage is increasing in the United States. In some forests (e.g., old-growth), other considerations and other benefits will outweigh carbon benefits. However, forests will change with or without management, and choosing not to manage has its own carbon consequences. Young, healthy forests are carbon sinks. As forests mature, they

generally become carbon-cycle neutral or even carbon emission sources because net primary productivity declines and the decay of trees killed by natural disturbances – windstorms, fire, ice storms, hurricanes and insect and disease infestations – emits carbon without providing the carbon benefits available through product and energy substitution” (Malmshemer et al. 2011). “In the long-term, a sustainable forest management strategy aimed at maintaining or increasing forest carbon stock, while producing an annual sustained yield of timber, fiber or energy from the forest, will generate the largest sustained mitigation benefit” (IPCC 2014).

Overall, research studies agree that carbon storage is enhanced in wet systems. Also, evidence suggests more carbon is sequestered by a richer mix of native species. Species-rich ecosystems are more stable over time and may provide a faster, stronger response to future changes in atmospheric carbon dioxide concentration. (Lennon et al. 2006.) Improving and/or restoring riparian and wetland systems through revised livestock grazing, riparian/wetland enhancement projects such as beaver mimicry and installing/replacing culverts to reduce point source sediment to the streams is predicted to increase their carbon storage capability.

Healthy native rangelands are also carbon sinks and properly managed livestock grazing at moderate levels can increase the soils capability to sequester carbon. (Liebig et al. 2010). Benefits of livestock grazing include increased litter incorporation into the soil and higher productivity of grazed vs. un-grazed grasses (varies with timing, intensity and frequency of grazing). Continuing livestock grazing while maintaining or improving the health of the rangeland within allotments in the CW is predicted to maintain or improve the soils capability to sequester carbon.

In addition to maintaining/restoring sagebrush steppe habitat, the proposed prescribed burns under the action Alternatives would create landscape scale “fire breaks” that would reduce fuel continuity, thus allowing fire managers a greater range of opportunities for the management of wanted and unwanted wildfire. Because of the timing of the burns (e.g., spring) carbon release due to the burns would be decreased as compared to wildfires, which generally burn during the hottest part of the summer. More litter (duff) would remain on the top soil in a cooler spring burn, therefore resulting in higher carbon sequestration capability than after a wildfire.

The proposed action alternatives are expected to incrementally increase carbon sequestration in the soil and vegetation within the CW. This would be accomplished by improving the health and resiliency of forest and woodland habitats, improving/restoring riparian/wetland areas, continuing and improving livestock grazing on rangelands, which is expected to maintain or improve upland conditions, and reducing the severity and size of potential damaging wildfires within, and adjacent to treatment areas. In addition, salvaging wood products will prevent the carbon in these products from being lost to decay or wildfire. The amount of increased carbon sequestration across the watershed cannot be quantified with current technology and its effect on climate change would be undetectable.

Continuation of stream temperature monitoring would provide long term data on streams. This data would be used to track any changes in stream temperature related to climate change or changes in land use practices within monitored drainages. This data would also allow managers

to identify drainages that may become critical thermal refugia for cold water species should climate change increase stream temperatures beyond preferred thermal levels.

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

Introduction:

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

Separate sections below discuss the predicted effects of alternatives B and C for: Commercial Timber Harvest and Non-Commercial Mechanical/Prescribed Fire Treatments; Wilderness; Recreation and Travel Management. Refer to Appendix D for a more in-depth Special Status Species (SSS) analysis.

Antelope Peak #20179

Alternative B:

Issue #1: Riparian, Wetland and Aquatic Habitat

Lentic reach #1750 failed to meet the riparian health standard. Under this alternative, this reach would be completely fenced and livestock would be excluded from the riparian enclosure. The enclosure would eliminate livestock related impacts within the wetland. Livestock exclusion from riparian areas for greater than 10 years resulted in colonization of bare soil by grasses and sedges (Hosten and Whitridge, 2007). Eliminating grazing impacts from this wetland would result in increased cover and composition of deep rooted vegetation, along with a reduction in bare ground. In addition, protecting the hydric soils from hoof impacts would ameliorate soil compaction, pugging and hummocking within the wetland and allow more effective ground water recharge within this area.

Issue #4: Special Status Species Habitat

Improving riparian habitat would be beneficial to sage grouse brood rearing as well as riparian obligate migratory birds. Not allowing grazing in the enclosure for 10 years would remove any disturbance to nesting migratory birds during that time period. Seeding of forbs on 50 acres within the Antelope Peak allotment within the unauthorized aerial spraying where the forb component was lost would benefit early brood rearing for sage grouse.

Figure 4.1 Upland Habitat in the Antelope Peak Allotment, July 2014**Brundage Creek #20708****Alternative B:**

The administrative changes proposed would have no impact on any resource in the allotment nor have any socio-economic impact to the permittee. The grazing AUMs authorized and the grazing season of use would be the same as the no action alternative.

Cocanougher Individual #10738**Alternative B:****Issue #1: Riparian, Wetland and Aquatic Habitat**

The allotment met the rangeland health standards. There are two pastures in the allotment: the south and the riparian pasture. The riparian pasture has not been grazed for the last 10 years and the BLM is proposing to allow livestock grazing in it for up to 15 days every other year for up to 30 AUMs. This grazing would normally be in the fall (September/October) period but up to two years in 10 may be during the spring (June/July) period.

Due to the excellent condition of the riparian area that the BLM IDT found, a conservative grazing plan that calls for 15 days of grazing every other year would not negatively impact the condition of the riparian area and would allow conditions to be maintained and the riparian health standard to continue to be met. The most critical aspect in any grazing plan for the protection of riparian areas is the length of time cattle spend on a stream reach (Marlow 1991). Up to 15 days of grazing every 700+ days, typically in the fall period, is a conservative approach to allow grazing in the riparian area without impacting riparian plants. The proposed 15 day

period once every two years, would allow riparian health to be maintained. In fact, occasional removal of residual vegetation may be beneficial to herbaceous wetland vegetation. Total exclusion may not be needed to maintain a healthy riparian system or to restore riparian areas that need improvement (Elmore, Boone and Kauffman 1994). See CW 2015 Watershed Assessment Report Appendix B for more information on grazing management tools.

Issue #4: Special Status Species Habitat

The grazing proposed would typically be during the fall (September/October) period. Most, if not all, migratory birds leave by September and head to wintering grounds. Fall use would remove any disturbance during the nesting season for trumpeter swans as well other migratory riparian obligates. Grazing would also only be authorized every other year allowing for residual cover for ground nesters.

In years when spring grazing (June/July), is allowed (2 out of 10 years) to accommodate the operator's livestock operation, disturbance is expected to be minimal. Much of the riparian pasture is covered in shallow standing water with only some exposed lands above the water. These lands aren't available to livestock for grazing due to the standing water and deep mud that livestock would avoid. Nesting trumpeter swans and other waterfowl utilize these lands but livestock would not be able to reach these areas. The grazing period authorized in spring is June 1 to July 30 not to exceed 15 days. If the grazing occurs in June there could be disturbance to nesting swans but if it occurs July, nesting would have been completed for most nesting migrants.

Cocanougher Individual #10738

Alternative C:

Issue #1: Riparian, Wetland and Aquatic Habitat

This alternative proposes to graze livestock for 21 days for the next three years with no rest between years in the riparian pasture. After three years of consecutive grazing, a BLM IDT would re-assess the riparian pasture and determine if the pasture is still meeting the riparian health standard. If a downward trend is documented, the IDT would develop a new management plan for livestock grazing in the riparian pasture.

Under this proposal, livestock grazing would be authorized for 21 days annually. The most critical aspect in any grazing plan for the protection of riparian areas is the length of time cattle spend on a stream reach (Marlow, 1991). Up to 21 days of grazing every 365 days, typically in the fall period, is a moderately conservative approach to allow grazing in the riparian area without impacting riparian health. Total exclusion may not be needed to maintain a healthy riparian system or to restore riparian areas that need improvement (Elmore, Boone and Kauffman 1994). See CW 2015 Watershed Assessment Report Appendix B for more information on grazing management tools.

Because the riparian pasture has been rested for the last 10 years, riparian health is high and resiliency to any ungulate grazing is also high. By grazing the allotment for 21 days for three years in a row, the BLM IDT would evaluate this 21 day grazing strategy in relation to how it impacts riparian health and if we should continue the 21 day grazing period without rest or develop a new grazing plan for the riparian pasture.

Issue #4: Special Status Species Habitat

The grazing proposed would typically be during the fall (September/October) period. During this period, avian nesting is completed and we don't expect any negative influences on nesting birds. Under this alternative no rest is planned, therefore the 21 day grazing period may not be compatible with leaving residual cover for spring nesting. Any influences on nesting would be doubled compared to Alternative B. The BLM would have to reassess the allotment after three years to determine if this authorization would continue.

Fish Creek #20172**Alternative B:****Issue #1: Riparian, Wetland and Aquatic Habitat**

There are seven stream reaches in the Fish Creek allotment. Five of these streams are larger perennial streams. These five larger reaches were rated as PFC. Two of the stream reaches (#314 and #315) found in the East pasture are small, interrupted, low energy reaches. Both small reaches were rated as FAR with a static trend. The two smaller reaches are lower priority reaches because they are not hydrologically connected to a larger stream and are interrupted or ephemeral.

Alternative B would create a riparian pasture that would include both reaches 314 and 315 that failed the riparian standard. The newly created riparian pasture would be rested every other year and during the grazing year, grazed for up to five days.

The period of use for the allotment in fall would be decreased from 23 to 18 days and both pastures (east and west) would receive growing season rest every other year.

Grazing the riparian pasture with reaches #314 and #315 for only five days every two years (5 days every 730 day period) would give each stream reach an opportunity to recover due to the very short duration of livestock use every other year. This rest would be effective because protecting soils from hoof impacts would increase the rate of recovery of riparian vegetation and reduce soil compaction. The most critical aspect in any grazing plan for the protection of riparian areas is the length of time cattle spend on a stream reach (Marlow, 1991). Total exclusion may not be needed to maintain a healthy riparian system or to restore riparian areas that need improvement (Elmore, Boone and Kauffman 1994). See CW 2015 Watershed Assessment Report Appendix B for more information on grazing management tools.

Issue #2: Upland and Sagebrush Steppe Habitat

The uplands on the Fish Creek allotment were in excellent condition. A reduction in authorized use in the fall would maintain or improve the excellent upland conditions. Although the fence would be built to BLM specifications, an increase in collisions by big game species would be expected.

Issue #4: Special Status Species Habitat

Construction of a riparian pasture and maximum use of the riparian pasture for up to five days every other year would see a recovery of riparian conditions. Improving riparian habitat would be beneficial to sage grouse brood rearing as well as riparian obligate migratory birds, refer to Issue #1 above. Decreasing the authorized AUMs by 50 by reducing fall use from 23 to 18 days

is expected to improve residual cover going into the fall and winter months and improving nesting habitat.

Fish Creek #20172

Alternative C:

Issue #1: Riparian, Wetland, Aquatic Habitat

The predicted effects of constructing a riparian pasture that includes both reaches #314 and #315 mentioned in alternative B would be the same as alternative C. We would expect measurable improvements in both stream reaches in the riparian pasture with only five days of use every two years. The riparian areas in the newly constructed northwest pasture would also improve because they would receive complete rest every other year and duration of use would be reduced by five days. Although the reaches found within the proposed northwest pasture were rated as low PFC, we expect the reaches to move up the PFC continuum to a higher PFC condition. The most critical aspect in any grazing plan for the protection of riparian areas is the length of time cattle spend on a stream reach (Marlow, 1991). A year of rest every other year would result in an increase in bank stabilizing riparian vegetation and reduced streambank impacts.

Issue #2: Upland and Sagebrush Steppe Habitat

The uplands in the allotment met the upland health standard. The newly constructed fence would create the northwest pasture. The northwest pasture would receive complete rest every other year. This additional rest would further benefit the uplands in the pasture. We expect the uplands to continue to be in excellent condition. This alternative proposes to construct 2.5 miles of new fence. Although the fence would be built to BLM specifications, an increase in collisions by big game species would be expected.

Issue #4: Special Status Species Habitat

The new riparian pasture would improve riparian habitat and this would be beneficial to sage grouse brood rearing as well as riparian obligate migratory birds, refer to Issue #1 above. Building a new fence to create the northwest pasture would allow for a full growing season of rest which would benefit ground nesting birds such as sage grouse and hiding cover for pygmy rabbits. Allowing for a maximum of 35 days of spring use and reducing fall use should allow for regrowth after the spring use and greater residual cover after fall use. This would be beneficial to ground nesters such as sage grouse.

Long Creek AMP #20154

Alternative B:

Issue #1: Riparian, Wetland and Aquatic Habitat

Two of the stream reaches in the West pasture (#378 and 1600) were rated as FAR static and therefore the Long Creek allotment did not meet the riparian health standard. Alternative B would reduce the grazing period in the West pasture from 45 to 30 days. AUMs would be reduced in the pasture from 400 to 255. All pastures would continue to receive complete rest once every third year. The permittee and the BLM would develop a water source off West Creek for livestock to drink away from West Creek.

Reducing the grazing duration (45 to 30 days) would have a positive effect on the riparian habitat. The most critical aspect in any grazing plan for the protection of riparian areas is the

length of time cattle spend on a stream reach. Total exclusion may not be needed to maintain a healthy riparian system or to restore riparian areas that need improvement (Elmore, Boone and Kauffman 1994). See CW 2015 Watershed Assessment Report Appendix B for more information on grazing management tools.

The proposed off-site water development in the West Creek pasture would help distribute cattle in the uplands and lessen time spent in the bottoms along West Creek. Providing an alternative watering site, in a suitable location is an effective tool for limiting the amount of time cattle spend in riparian areas. Adding a watering site at the head of West Creek would encourage cattle distribution in the uplands and away from the sensitive riparian areas in need of improvement.

A water development in upland areas is often a key factor in reducing livestock watering in riparian areas. Fencing the source would protect the associated habitat in the immediate vicinity. Ehrhart and Hansen (1997) state, “The one quantifiable factor 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. Where offsite water is located a sufficient distance from streams to draw livestock away from these areas and to spend less time loafing and grazing in riparian areas, there would be a reduction in waste inputs to streams, soil compaction, channel impacts and grazing on riparian vegetation. Augmenting the water development with shade, such as placing the watering trough near existing trees, would also help to reduce the time livestock spend in riparian areas (TR-1737-20, 2006). Design features for springs developments, listed in Section 2.3.3, would mitigate the potential of drying up or shrinking the wetland areas associated with spring sources. Riding the cattle out of the riparian areas is also expected to decrease impacts to the riparian area, especially once there is available water in the uplands due to the proposed off-site water development.

Reducing the duration of use by 33%, providing off-site water and requiring riding is expected to reduce livestock impacts to fish habitat. Reducing time in the West pasture would increase greenline vegetation and reduce stream bank impacts. Improvement in stream bank vegetation and reduction in bank alteration would decrease sediment input on BLM reaches. Overall improvements to the riparian area would correlate to improved fishery habitat. As riparian areas improve, stream functionality and fish habitat would follow. Improvements to stream bank stability would lead to improved spawning habitat as well as improved pool formation/ quality through reduced sediment input.

Issue #2: Upland and Sagebrush Steppe Habitat

The uplands in the allotment were in excellent condition and met the upland health standard. Grazing use in the West pasture would decrease so we expect lighter use in the uplands so upland conditions would be maintained in high PFC condition.

The new livestock watering trough would be placed east of West Creek in the uplands to reduce grazing pressure off West Creek. We expect increased grazing use in the immediate vicinity (1/4 mile) of the trough in the uplands after the project is completed. However, the 33% reduction in

authorized grazing AUMs in the West pasture should compensate for any increase in grazing use in the vicinity of the livestock trough in the uplands.

Issue #4: Special Status Species Habitat

While there is no known occurrence of arctic grayling on BLM managed portions of Long Creek or its tributaries, grayling are known to reside in the lower reaches of Long Creek downstream of BLM managed lands. Actions aimed at improving stream and riparian function on BLM land could have beneficial impacts to downstream grayling habitat. Improvements could benefit downstream habitat through decreased stream temperatures. Additionally, reductions in upstream point source sediment would decrease sediment movement through the system.

Reduction of AUMs and days grazed from 45 to 30 in the West pasture along with a water development is expected to reduce impacts along West Creek. Along with the rest every third year, riparian habitat should improve to provide increased brood rearing habitat and migratory bird nesting in the West pasture. Requiring riders would also reduce loafing by livestock and get better distribution throughout the allotment. Refer to Issues #1 and #2 above.

Long Creek AMP #20154**Alternative C:****Issue #1: Riparian, Wetland and Aquatic Habitat**

Two of the stream reaches in the West pasture (#378 and 1600) were rated as FAR static. Alternative C would eliminate livestock grazing for the next ten years in the West pasture where the riparian health standard was not met. AUMs would be reduced in the allotment from 1345 to 945.

Resting the West Creek pasture would give reaches #378 and #1600 an opportunity to improve/recover. This would be effective because livestock exclusion from riparian areas for greater than 10 years resulted in colonization of bare soil by grasses and sedges, in turn replaced by riparian shrubs and trees (Hosten and Whitridge, 2007). Protecting soils from hoof impacts would increase the rate of recovery of riparian shrubs in the area also. Livestock exclusion has shown to be the most effective way to recover a riparian zone (Elmore and Kauffman 1994). Improvements to stream reaches #378 and #1600 would improve more quickly under this alternative than Alternatives A or B.

Issue #2: Upland and Sagebrush Steppe Habitat

The uplands in the allotment were in excellent condition and met the upland standard. Grazing use in the West pasture would be eliminated for the next 10 years, so we expect West Creek's uplands to be maintained in a high PFC condition. We also expect the two other pastures to continue to be in PFC. The no grazing alternative in the West Creek Pasture would result in a build-up of fine fuels. This additional fuel loading would increase the probability of a wildfire within this area. An increase in fine fuels could facilitate fires (both natural and man caused) moving faster and further than in the other alternatives. While putting fire back into these systems has some positive ecological benefits (e.g. diversity on the landscape), a high severity wildfire could also lead to some negative impacts to riparian habitat (e.g. sediment input, down cutting, erosion) depending on the location and size of the fire in the drainage.

Issue #4: Special Status Species Habitat

While there is no known occurrence of arctic grayling on BLM managed portions of Long Creek or its tributaries, grayling are known to reside in the lower reaches of Long Creek downstream of BLM managed lands. Actions aimed at improving stream function on BLM administered land could have beneficial impacts to downstream grayling habitat. Improvements to stream function and riparian vegetation could benefit downstream habitat through decreased stream temperatures. Reductions in upstream point source sediment would decrease sediment movement through the system.

Implementing ten years of rest to improve riparian conditions would be beneficial to sage grouse for brood rearing and nest and for migratory bird nesting. The 10 year rest period would allow for riparian woody species to recover and potentially allow for beaver re-colonization. The uplands were already PFC, but the extended rest would ensure cover for sage grouse nesting and brood rearing.

Resource Concern#2: Socioeconomics

The West Creek pasture would be rested for the next 10 years. This would reduce the authorized use by 400 AUMs. Montana State University has shown that a single AUM on private land is worth about \$20-25. To replace these lost AUMs, the permittee would have to spend at least \$8,000-10,000 assuming the permittee could find available pasture within a reasonable distance to his existing operation. This action would reduce the flexibility in the permittees operations.

In order to rest the BLM administered lands in the West Creek pasture for the next 10 years, the BLM would have to build and maintain about one mile of fence to separate the BLM administered lands from the private lands in West Creek. The normal cost for a mile of fence in flat, non-rocky fence is about \$10,000.00. However, the fence needed to fence out private lands in West Creek is located in a rocky area and is rugged, steep topography. In addition, the fence is in a remote area in the Centennial Valley about 70 miles away from most fencing contractors. A reasonable estimate to build a mile a fence in this location would be around \$18,000.00.

Lousy Springs #00763**Alternative B:**

The administrative changes proposed would have no impact on any resource in the allotment nor have any socio-economic impact on the permittee. The BLM grazing AUMs authorized and the season of use would not change from the no action alternative.

McCandless Brothers SGC**Alternative B:**

The administrative changes proposed as well as addition of two additional 40 acre tracts of land to the allotment would have no impact on any resource in the allotment. There is no riparian or wetland habitat on BLM administered land within the allotment. The McCandless Brothers SGC allotment met all rangeland health standards as did the two 40 acres tracts proposed to be added to the allotment. The proposal is to rest the allotment at least every other year which is predicted to maintain or improve current upland health conditions.

Morton Individual SGC #20163**Alternative B:****Issue #1: Riparian, Wetland, Aquatic Habitat**

The Morton Individual SGC allotment is a small allotment that includes about 50% BLM administered land and 50% private land. The BLM is proposing to build a fence that would separate the BLM from the private owned lands. This new fence would then allow BLM to control grazing on the BLM administered lands. BLM would authorize a 15 day maximum grazing period every other year for 11 AUMs.

The allotment was grazed about 45 days every year during the past 10 years. The new grazing plan would create a conservative grazing plan that authorizes 15 days of grazing every other year. The reduced duration of grazing (45 days to 15 days) along with the addition of rest every other year would facilitate improvement of riparian health relatively quickly. The most critical aspect in any grazing plan for the protection of riparian areas is the length of time cattle spend on a stream reach (Marlow, 1991). Up to 15 days of grazing every 700+ days is a conservative approach to authorize livestock grazing while improving riparian condition. The proposed 15 day grazing period once every two years is expected to result in increased riparian vegetation and reduced streambank impacts which would allow stream channel recovery. Total exclusion may not be needed to maintain a healthy riparian system or to restore riparian areas that need improvement (Elmore, Boone and Kauffman 1994).

Issue #2: Upland and Sagebrush Steppe Habitat

The reduction in grazing days from about 45 to 15 would benefit uplands and help them to be able to complete most of their life cycle without herbivory by livestock. Under this alternative we expect the Uplands to be in an upward health trend within the next year and in PFC in the next five to 10 years.

Resource Concern#2: Socioeconomics

Although the grazing days would be reduced on BLM from 45 to 15, BLM is still authorizing a grazing permit for BLM acres in the allotment. Once the fence is built that separates BLM from private lands, the permittee could still graze their private lands for the 45 day grazing period. Based on the fact that the allotment is small, BLM is still authorized grazing on BLM lands and that most of the allotment is private lands, we don't expect any considerable negative socioeconomic impacts to the grazing permittee under this alternative.

Morton Individual SGC #20163**Alternative C:****Issue #1: Riparian, Wetland, Aquatic Habitat**

Under alternative C, the BLM is proposing to build approximately two miles of fence along the BLM/private land boundary. Once the fence is completed, the BLM would rest the allotment for the next 10 years. Livestock would not be allowed in the allotment.

Resting the BLM administered lands for the next 10 years would give reach #1608 an opportunity to improve/recover. This would be effective because livestock exclusion from riparian areas for greater than 10 years resulted in colonization of bare soil by grasses and sedges, in turn replaced by riparian shrubs and trees (Hosten and Whitridge, 2007). Protecting

soils from hoof impacts would increase the rate of recovery of riparian shrubs in the area also. Livestock exclusion has shown to be the most effective way to recover a riparian zone (Elmore and Kauffman 1994). Improvements to stream reaches #1608 would improve more quickly under this alternative than Alternatives A or B.

Issue #2: Upland and Sagebrush Steppe Habitat

Resting the BLM lands for the next 10 years would expedite the recovery of the uplands and help them to reach PFC sooner than alternative B.

Resource Concern#2: Socioeconomics

For the 10 year period prior to this EA, the BLM authorized 11 AUMs of grazing on BLM lands on this allotment. Under alternative C, the BLM would not authorize any grazing on this allotment and the permittee would have to find 11 AUMs of grazing somewhere else to replace AUMs lost by this alternative. Although finding these AUMs near this allotment may be challenging, we don't expect the 11 AUMs lost from BLM lands to put a substantial financial burden on the permittee. If 11 AUMs of grazing are not available, it is within reason to supplement these AUMs with the purchase of hay.

Peet Creek #10730

Alternative B:

Issue #1: Riparian, Wetland and Aquatic Habitat

Although the allotment met the riparian health standard with 10 of the 12 reaches determined to be PFC, two reaches (#1651 and 1653) were rated as FAR static. The starting date for authorized grazing would be changed from May 15 to July 1st. In addition, the Upper Pasture where reaches 1651 and 1653 are located would be rested every third year. In order for the Upper pasture to be rested, it may be necessary to build about one mile of fence to separate the Upper and Lower Pastures.

Resting the Upper Pasture every third season would provide sufficient opportunity for enhanced plant vigor, regrowth, and energy storage in both the riparian and uplands areas. During the rest year, deep rooted vegetation would establish or expand on banks void of vegetation and risk of erosion from high flows would be lessened. The increased vegetation would catch sediment and build banks more effectively during the rest year when streambanks are not being impacted by hoof action. The later authorized start date (July 1 compared to May 15) would allow most herbaceous plants to complete their life cycle each year without being grazed. We expect riparian areas 1651 and 1653 to benefit from this later grazing period for several reasons including; riparian soils are more resilient to herbivory when they aren't wet/saturated during the late spring and early summer and riparian plants are able to grow during most of the growing season and plants are better able to withstand grazing use when above ground and below ground growth is near completion for the year. Measurable improvement in the stream reaches in the Upper Pasture is expected as a result of adding rest every third year and reducing the duration of use. Research has shown that total exclusion may not be needed to maintain a healthy riparian system or to restore riparian areas that need improvement (Elmore, Boone and Kauffman 1994).

The proposed one mile of fence would benefit riparian reaches 1651 and 1653 by effectively containing livestock to the pastures in which they are authorized.

Issue #2: Upland and Sagebrush Steppe Habitat

The uplands in the allotment were in excellent condition and met the upland standard. The Upper Pasture would be rested once every three years so we expect the Upper Pasture's Uplands to maintain a high PFC condition. During the year when the Upper Pasture is rested, more grazing use would occur on the uplands in the lower two pastures but we expect both pastures to continue to be in PFC because of the later start date (July 1 compared to May 15). This would allow most upland plants to complete their life cycle up to seed shatter before the grazing occurs. The fence may impede big game movement through this area which would be mitigated by constructing the fence to meet BLM wildlife specifications.

Issue #4: Special Status Species Habitat

Overall, WCT habitat within the Peet Creek drainage is in PFC condition. However, the East Fork of Peet Creek carries a high sediment load, which originates on BLM managed lands. The source is associated with erosion in an area of naturally failing beaver dams. The tributary reaches that were rated as FAR add additional sediment to an already naturally high sediment laden stream. Providing a rest year would allow for improved stream bank conditions throughout the drainage, but would especially benefit the reaches 1651 and 1653. As these reaches improve the sediment levels overall would decrease. The placement of sediment catchment structures i.e. beaver mimicry structures, where the stream is down cutting through the old beaver complex would reduce sediment levels downstream. This would improve spawning habitat as well as improve pool formation. As sediment is trapped behind the structures, the localized water table would rise, allowing for increased deep rooted vegetation such as sedges and willows, which in turn would improve the bank stability, further reducing sediment input into the stream. The proposed project area falls within the Centennial WSA and would require work to be done in a manner compliant with WSA policy.

Resource Concern#2: Socioeconomics

The one mile of fence needed to separate the Upper and Lower pastures would need to be constructed. The normal cost for a mile of fence in flat, non-rocky fence is about \$10,000.00. However, the fence needed in Peet Creek Allotment is located in rocky areas and is rugged, steep terrain. In addition, the fence is in a remote area in the Centennial Valley about 70 miles away from most fencing contractors. A reasonable estimate to build a mile a fence in this location would be around \$18,000.00.

Red Rock #30636

This allotment is comprised of a mixed ownership of BLM and privately owned lands. About 80% are BLM administered lands and 20% are private. The allotment is about 353 acres. The allotment has two pastures: Red Rock and the Upper pasture. The Red Rock pasture has 56 AUMs and the Upper Pasture 30 AUMs.

Alternative B:**Issue #1: Riparian, Wetland and Aquatic Habitat**

The only stream reach in the allotment (#380) was rated as FAR static and therefore the allotment did not meet the riparian health standard. This stream reach is located directly below Lima Dam and therefore incurs extreme fluctuations in water flows and water levels due to operation of the dam for irrigation. This extreme fluctuation of water flows was determined to

be a causal factor in this stream reach being in FAR condition. The BLM determined that current livestock grazing was also contributing to the FAR rating. Alternative B would authorize grazing for 15 days, during two years out of three. Use would be rotated between June in year 1, and August in year 2. The Red Rock pasture would be rested once every third year.

Although the grazing rotation is the same as what is currently authorized, the grazing system and authorized use period has not been successful due to poor fence condition and fluctuating water levels in the Red Rock River caused by erratic water releases. During most years, livestock were able to break through the fence or move through along the Red Rock River at low river levels from private lands into the Red Rock pasture.

The fences on the west and south side of the Red Rock pasture would be rebuilt and a cattle guard would be installed to prevent livestock from entering the Red Rock pasture. The authorized grazing plan would be followed. It is apparent that during several years in the past, livestock grazing occurred for a longer duration than was authorized due to fences not containing livestock on private lands adjacent to the BLM.

Having a grazing duration that is limited to 15 days and resting the allotment every third year would have a positive effect on the riparian habitat. The most critical aspect in any grazing plan for the protection of riparian areas is the length of time cattle spend on a stream reach (Marlow, 1991). See CW 2015 Watershed Assessment Report Appendix B for more information on grazing management tools.

The length of rest to initiate recovery in degraded riparian areas depends upon the vegetative composition and streambank condition (Clary and Webster 1990). Stream reach # 1608 was determined to be functioning at risk with a static trend. Current riparian condition suggests that resting the allotment one year in three, along with a very short duration of use rotated between June and August is sufficient to promote improved riparian function. Resting one year in three would also allow a full growing season for riparian plants to recover and complete their physiological processes. Studies show resting pastures favors low energy stream systems with herbaceous bank forming vegetation (Elmore and Kauffman 1994), like the riparian habitat of lower in this allotment. Resting the allotment every third year along with a short duration of use would allow recovery within the control of the BLM. The extreme fluctuation of water flows will continue to impact this stream reach.

Issue #2: Upland and Sagebrush Steppe Habitat

This allotment did not meet the upland health standard. Total number of days authorized for grazing in the Red Rock River pasture would be 15 days two years out of three. Resting the allotment every third season, along with rotational grazing (June/August) would provide sufficient opportunity for enhanced plant vigor, regrowth, and energy storage in both the riparian zones and uplands. Reseeding areas of the densest noxious weed infestations after herbicide treatments would mitigate these areas being re-infested by noxious weeds and improve biodiversity and upland health within the Red Rock pasture. The Upper pasture met the upland health standard and conditions would be maintained in PFC. Reconstructing the fence would allow the grazing rotation to be effective and successful. Repairing the boundary fences to meet

BLM specifications and prevent unauthorized use as well as removal of dysfunctional interior fences would allow for freer wildlife movement.

Issue #4: Special Status Species Habitat

Trumpeter swans are known to use the river corridor below the dam; however nesting has not been documented. Improved riparian conditions along this corridor would improve potential for nesting of trumpeter swans as well as riparian obligate species.

Resource Concern#2: Socioeconomics

The permittee would be required to build the fence on the west and south side of the Red Rock pasture total about two miles. The normal cost to construct a mile of fence in flat, non-rocky fence is about \$7,000.00. However, the fence needed in the Red Rock Allotment is located in somewhat steep terrain. In addition, the fence is in a remote area in the Centennial Valley about 70 miles away from most fencing contractors. A reasonable estimate to construct two miles of fence in this location would be around \$15,000.00.

Red Rock #30636**Alternative C:****Issue #1: Riparian, Wetland and Aquatic Habitat**

The only stream reach in the allotment (#380) was rated as FAR and therefore, the allotment did not meet the riparian health standard. Alternative C would eliminate livestock grazing in the Red Rock pasture for the next 10 years. The length of rest to initiate recovery in degraded riparian areas depends upon the vegetative composition and streambank condition (Clary and Webster 1990). Stream reach # 380 was determined to be functioning at risk with a static trend. Resting the allotment every year for the full growing season for the next 10 years would allow riparian plants to recover to the extent allowed by the extreme fluctuation of water levels due to the reaches proximity to Lima Dam. Studies show resting pastures favors low energy stream systems with herbaceous bank forming vegetation (Elmore and Kauffman 1994), like the riparian habitat of lower in this allotment during the latter portions of the growing season. Protecting soils from hoof impacts would increase the rate of recovery of riparian shrubs in the area also. Livestock exclusion has shown to be the most effective way to recover a riparian zone (Elmore and Kauffman 1994).

Issue #2: Upland and Sagebrush Steppe Habitat

This allotment did not meet the upland health standard due to conditions in the Red Rock River Pasture. The Upper pasture was in properly functioning condition. The Red Rock pasture would be rested for the next 10 years. Removing domestic livestock from the Red Rock pasture would be beneficial to rangeland vegetation because residual vegetation would increase. The accumulation of dead plant material would initially be beneficial by providing additional protection to the soil from erosion as well as leading to an increase in the organic matter in the soil. Grasses evolved with periodic removal of vegetation from various causes (including fire, wild ungulate grazing, insects, etc.). After a certain point is reached however, the buildup of litter will begin to inhibit the growth of vegetation (Knapp, et al., 1986). This could cause a decrease in the productivity, palatability and overall plant health to many of the native bunchgrasses. Also additional fuel loading of fine fuels would increase the probability of wildfire in this area which may have both positive and negative impacts.

Resting the allotment would provide key herbaceous species an opportunity establish new seedlings, increase vigor and increase upland plant productivity. Bare ground would be decreased, plant interspaces contracted and the potential for wind and water erosion reduced. Key forage species like bluebunch wheatgrass and Idaho fescue, would eventually increase in abundance and relative canopy cover, while the less desirable increaser species, like broom snakeweed and rubber rabbitbrush, along with noxious weeds including houndstongue, Canada thistle, and spotted knapweed, would decline. Seeding areas currently infested with noxious weeds would also contribute to improved upland health conditions.

Although the allotment did not meet the upland standard, the Upper pasture was found in properly functioning condition. Under Alternative C, management for the Upper pasture would be the same as the No Action alternative and conditions are predicted to be maintained.

Issue #4: Special Status Species Habitat

Trumpeter swans are known to use the river corridor below the dam; however nesting has not been documented. Providing ten years of rest would improve riparian conditions along this corridor for potential trumpeter swan nesting quicker than under alternative B. Breeding habitat for riparian obligate species would also improve quicker than under alternative B.

Resource Concern#2: Socioeconomics

The Red Rock allotment would be rested for the next 10 years. This would eliminate 56 AUMs from the BLM grazing permittee. Montana State University has shown that a single AUM on private land is worth about \$20-25. To replace these lost AUMs, the permittee would have to spend at least \$1120-1400.00 assuming the permittee could find available pasture within a reasonable distance to his existing operation.

The permittee would be required to build the fence on the west and south side of the Red Rock pasture total about two miles. The normal cost to construct a mile of fence in flat, non-rocky fence is about \$7,000.00. However, the fence needed in the Red Rock Allotment is located in somewhat steep terrain. In addition, the fence is in a remote area in the Centennial Valley about 70 miles away from most fencing contractors. A reasonable estimate to construct two miles of fence in this location would be around \$15,000.00.

Rody Individual #20685

Alternative B:

Issue #2: Upland and Sagebrush Steppe Habitat

The Rody Individual allotment is mostly private lands with about 400 acres of BLM administered lands intermixed with private lands. The allotment would be grazed for <60 days each year after July 1. This allotment has been grazed for approximately 90 days in the past beginning in May. Reducing the grazing period and delaying the start date would allow all upland plants to begin their life cycle and complete most of their life cycle without herbivory. This later start date would provide upland plants an opportunity to produce new vegetation, regrowth root systems and regain vigor before being grazed. The reduction in the grazing durations to 60 days would also allow plants to regrow in the late summer or fall without being grazed. This revision is expected to improve upland health within the allotment. Reseeding areas of the densest noxious weed infestations after herbicide treatments would mitigate these

areas being re-infested by noxious weeds and improve biodiversity and upland health within the allotment.

Issue #4: Special Status Species Habitat

The reduced grazing period and deferred start date would eliminate disturbance from livestock during the nesting season for migratory birds. The reduction in grazing period should allow for increased residual cover for ground nesters and improve brood rearing habitat for sage grouse.

Shambo Units #20152**Alternative B:****Issue #1: Riparian, Wetland and Aquatic Habitat**

Although the allotment met the riparian health standard, the grazing permittee has voluntarily agreed to reduce the grazing period from 120 to 100 days of authorized grazing once every three years. During two of every three years, each pasture in the allotment would receive full rest. All five rangeland health standards were met in the allotment including the riparian standard on 30 stream reaches including 29 miles of stream.

All pastures in the Shambo allotment are rested twice every three years which is allowing the Rangeland Health standards to be met as documented by the BLM IDT (page 45, 46 CW Assessment Report 2015). Each pasture in the Shambo allotment would be grazed \leq 100 days every three years (1095 days) or about 9% of time every three years.

Based on BLM IDT findings, two years of rest every three years under current grazing management has been effective in meeting the riparian health standard throughout the Shambo allotment and reducing the duration of use from 120 days to 100 days once every third year would allow maintenance or improvement of current conditions.

Issue #2: Upland and Sagebrush Steppe Habitat

The uplands in the allotment were in excellent condition and met the upland standard. We expect these conditions to continue as the grazing rotation is similar to current management.

A small portion of fence on the Shambo Units allotment perimeter boundary in T14S, R3W Section 35 would be altered (See Picture below). The fence is currently located on the BLM/private ownership boundary which is also the Wilderness Study Area Boundary. The current location is in a steep area that has snow lodge on it each year causing the fence to break annually. The fence also creates a trap for livestock and wildlife due to the configuration of the fence which crosses two steep ravines. The proposal is to move the fence about 200-1000 feet to the south and follow the contour of the ridge which is in the Wilderness Study Area. This would reduce barriers/traps for livestock and wildlife and make the fence easier to maintain for the permittee and adjacent landowner.

Figure 4.2 Shambo Units Allotments Perimeter Boundary Fence - Proposed Change looking Southwest



Issue #4: Special Status Species Habitat

A reduction in grazing pressure through a shorter grazing duration would assist in reducing sediment inputs not originating from natural sources. Reducing the time livestock spend using riparian areas would result in less impacts to stream banks and less utilization of greenline vegetation. Both of which would reduce sediment as well as improve stream bank associated fish habitat. Projects such as reducing conifer cover in meadow habitat would also assist with sediment reduction by maintaining or increasing willow and sedge communities along stream margins. Increased sunlight reaching the understory would provide increased productivity in the deciduous and herbaceous composition in the riparian area resulting in improved bank stability due to increased vegetative ground cover as well as improved deep binding root mass.

Removing the remains of the old logging bridge in Bean Creek would remove a chronic sediment source in a system already overburdened by sediment. Additionally, this old structure acts as debris jam causing a backwater to form which is eroding the old road abutment. Removing and re-contouring this site would reduce sediment that is impacting spawning and pool habitat downstream and allow for more natural channel formation and improvements to WCT habitat.

Planting willow and sedge throughout the length of riparian area treated in the 2013 Bean Creek conifer treatment would accelerate natural re-colonization. Accelerating the process would reduce the period required to stabilize stream banks with deep rooted riparian species.

Resource Concern #7: Wilderness Characteristics

A fence is proposed to be constructed across the corner of the WSA near Shambo Creek to replace a fence that is approximately on the boundary of the WSA. The current fence was constructed in its current location to avoid the WSA, but has caused problems for both livestock and wildlife. The existing fence does not conform to any natural features of the landscape, going from ridgeline to ridgeline across a deep, narrow draw where cattle and wildlife are often trapped, and where snow loads frequently damage the fence.

BLM Manual 6330 specifically addresses grazing management activities beginning on page 1-16. The guidance relevant to this particular fencing proposal is problematic in that it distinguishes between “Pre-FLPMA livestock developments” and “New livestock developments.” The existing fence being considered was re-constructed after the Winslow Fire in 2003, but replaced a fence that was clearly pre-FLPMA (October 21, 1976). Whether the fence was constructed exactly where it was originally, or moved somewhat is unclear. The currently existing fence is approximately on the boundary of the private and public land, which is also the boundary of the WSA. However, it would be difficult to say that the fence is clearly on private or public lands. In any case, the fence would be a pre-FLPMA fence, but may or may not have been in the WSA prior to October 21, 1976. Therefore, it will be evaluated under both standards for consideration under the policy.

Under pre-FLPMA livestock developments, the policy allows for the continued use and maintenance of developments (including fences) in the same manner and to the same degree as such use was being conducted on that date. They can have “the same, but not more, physical or visual impact as they did at that time.” In this case, reconstructing the existing fence across the corner of the WSA would meet this criterion. Even if the fence is relocated from its existing location, the physical and visual impact would be essentially the same provided the existing fence is removed.

If it is considered a new livestock development, the policy is stricter, requiring that it “meet the non-impairment standard or one of the exceptions, such as protecting or enhancing wilderness characteristics.” A new fence clearly does not meet the non-impairment standard, which requires that the use or facility is temporary. Although the fence could be physically removed, there is no intention to do so since it is considered necessary to effectively manage the livestock in this area. Since the proposed fence clearly does not satisfy the non-impairment standard, it must satisfy one of the exceptions to that standard in order to be considered consistent with the policy. Two possible exceptions could apply; one is that the grazing activity is a grandfathered use, and the other is that it could protect or enhance wilderness characteristics or values.

Clearly the grazing activity is grandfathered since it occurred prior to passage of FLPMA. As a grandfathered use, “the uses and facilities may continue in the same manner and degree as on that date, even if this impairs wilderness suitability.” (BLM Manual 6330, p.1-12) It goes on to say that, “The benchmark for the ‘manner and degree’ of an existing use is the physical and visual impact that use was having on the area on October 21, 1976.” The currently proposed fence relocation, though it may be in a different location, would not exceed the physical and visual impact it was creating at that time, although it would occur in a slightly different location, and clearly within the WSA. The exact location of the fence prior to its reconstruction in 2003 is

not known. The relocated fence appears to satisfy the manner and degree benchmark for a grandfathered existing use and facility.

In two other locations, a livestock management fence is proposed to be constructed on the WSA boundary. One location would include about ½ mile of fence near Corral Creek Road on the east end of the valley, and the other about ¼ mile of fence along the WSA boundary between Peet Creek and Bean Creek. These fences would be constructed as closely as possible to the property boundary and would have minimal impact on the WSA. They could be constructed entirely outside of the WSA, resulting in no impact. Should the fence meander back and forth across the boundary, the impacts to the WSA would be negligible.

4.2.7 Predicted Effects of Commercial Forest Harvests and Non-Commercial Mechanical/Prescribed Fire Treatments

Alternative B:

Issue #1: Riparian, Wetland and Aquatic Habitat

Commercial forest harvests and non-commercial mechanical/prescribed fire treatments would take place in the Shambo Units, Price Creek, Fish Creek, Long Creek and Peet Creek allotments (see Appendix A, Map #2). Non-commercial mechanical/prescribed fire treatment boundaries may include riparian areas. Prescribed burns are not expected to affect the riparian areas although the burn may enter the greater riparian area with low intensities during holding operations.

Negative effects of the burn on riparian areas are not predicted because prescribed burns are planned in the early spring and later fall periods. During this time period, fire intensities are lessened due to shorter burn periods, lower daytime temperatures and typically higher fuel moistures. The exception may be in the fall when fuel moistures are similar to summer fuel moisture conditions. However, if fuel moisture is low in the fall burn period, the prescribed burns would be implemented with appropriate weather conditions and identified objectives as outlined in the project specific burn plan. Additionally, adequate vegetative buffers would be planned between the burn units and the streams to mitigate short term sediment input in the riparian areas.

Predicted effects of these treatments to riparian habitat are discussed in section 4.2.3 (Predicted effects common to all action alternatives).

Issue #2: Upland and Sagebrush Steppe Habitat

The Upland Health Standard in 33 of the 36 allotments in the CW was met under current management. Three allotments including Morton Individual SGC, Rody Individual and Red Rock did not meet the Upland health standard. Fuels reduction treatments are not proposed within these three allotments.

Fuels reduction treatments utilizing prescribed fire and mechanical methods would occur on up to 5,205 acres. Of these 5,205 acres, only 262 acres in the Corral West treatment specifically aims at reducing conifer expansion into sagebrush/grassland (See Alternative Comparison Table 2.47). The majority of the fuels treatments are in areas dominated by trees where the goal of the treatment is to maintain Douglas-fir savannah, promote aspen regeneration or promote 5 needle

pine regeneration. One of the primary benefits of reducing fuel loads are to decrease the intensity of potential wildfire, thus offering fire managers and firefighters more opportunity for direct fire suppression or other appropriate response. These benefits would prove effective until fuels loads reach pretreatment levels. This may be up to 30 years, depending on other disturbances that affect fuels loads (i.e. wildland fire, insects/disease outbreaks, windthrow). The health of the uplands and associated upland species, including sagebrush obligate species, is expected to remain in PFC in these areas proposed for treatment. Prescribed burning mimics wildfire, a natural occurrence, and native plants have evolved with fire. When the upland plant communities are healthy, as were 33 of the 36 allotments in the CW, they are able to withstand a low-intensity prescribed burn which occurs in early spring when fire conditions are less severe and usually create a mosaic burn pattern.

Fire is not a new disturbance to uplands in the CW as these systems evolved with fire and are dependent on this natural disturbance for regeneration. For example, three-tip sagebrush, which sprouts after a fire, is found throughout the Centennial Watershed intermixed with mountain big sagebrush. Many plant and wildlife species have adapted to fire disturbance, and their continued survival and success is dependent on it. Fire not only prompts regeneration of many plant species, it recycles mineral elements like nitrogen and phosphorus, and removes accumulated organic matter which opens up new spaces for native plants to become established. Detection and treatment efforts before and after prescribed burn treatments would mitigate the spread of cheatgrass and noxious weeds within the treatment units.

Issue #3: Forest and Woodland Habitat

Up to 448 acres of commercial harvest would be implemented within the CW. Douglas-fir dominated and mixed conifer stands would be thinned to an average basal area of 60 ft² per acre, with a range of 20-120 ft² per acre. Where spruce is dominant, spruce trees may be harvested in irregularly shaped patches, creating small openings and group reserve areas. Forest openings and reserve areas would increase structural diversity and reduce windthrow of shallow rooted tree species. Following harvest in all forest types, the decrease in competition among remaining trees for water and nutrients would increase residual stand resiliency and vigor. Healthy stands would be more likely to survive future insect outbreaks than untreated stands. Sunlight reaching the forest floor would increase herbaceous vegetation. Salvage harvest would remove trees recently affected by bark beetle and spruce budworm. Recent insect-caused mortality and currently infested trees would be harvested before decay reduces merchantability. In areas where beetle-killed lodgepole pine is harvested, natural lodgepole regeneration is anticipated to form a new age-class stand that would not be susceptible to mountain pine beetle for the next 40 to 80 years.

The construction of up to four miles of temporary road and the use of mechanized equipment has potential to cause soil disturbance, and to introduce or spread noxious and invasive weeds. Power washing and inspecting all off-road equipment prior to operating on BLM-administered land is a standard timber sale contract provision. Thorough inspections, followed with monitoring and treating weeds if discovered, would reduce the likelihood of noxious and invasive species becoming established or being spread as a result of commercial harvest activity. Construction standards on new temporary roads would be to the minimum required for safe transport of merchantable material. Following harvest activity, all new temporary roads would

have adequate drainage features constructed or installed, and be physically closed to preclude all vehicle use. BLM timber sale contracts require contractors to follow Montana SMZ Law and Rules, and Montana Forestry BMPs. Strict adherence to the regulations and guidelines found in these documents would reduce erosion and water quality impacts associated with commercial harvest activities.

The installation of up to two temporary stream crossings would result in minor sediment inputs to the streams during the process of installation and removal. By obtaining all applicable State and Federal Permits required for the installation of temporary stream crossings, appropriate mitigation measures would be reviewed prior to issuance in order minimize impacts from this activity.

Fuels treatments are specifically designed to promote aspen regeneration, promote five needle pine regeneration and maintain the Douglas-fir savannah that was restored in harvest units under the previous CW projects (See Tables 2.30 and 2.45). These fuel treatments would promote diversity and improve forage conditions for big game species. These projects are expected to be beneficial by restoring natural disturbance processes that have been absent in much of the CW.

Figure 4.3 Aspen regeneration in the 2003 Winslow Burn area - Shambo Units Allotment, July 2014



Fuels reduction treatments utilizing prescribed fire and mechanical methods would occur on up to 4,943 acres in forested and woodland habitats. Of the 4,943 total acres of prescribed burns in forested and woodland habitats, 774 acres are proposed to maintain Douglas fir savannah, 2,800 acres aimed at promoting aspen regeneration and 1,369 acres to promote five needle pine

regeneration. One of the primary benefits of reducing fuel loads are to decrease the intensity of potential wildfire, thus offering fire managers and firefighters more opportunity for direct fire suppression or other appropriate response. These benefits would prove effective until fuels loads reach pretreatment levels. This may be up to 30 years, depending on other disturbances that affect fuels loads (i.e. wildland fire, insects/disease outbreaks, windthrow).

Issue #4: Special Status Species Habitat

The timber harvest and fuels treatments are expected to increase biodiversity and mimic natural processes. Much of the Centennial Mountains has had fire suppression over the past 100 years and forested habitats are overcrowded. The proposed timber harvest equates to less than 1% of the entire forested habitat on BLM lands in the CW. Selected removal of timber to restore aspen clones and Douglas –fir savannah may have short term localized impacts to some species but would be beneficial to watershed health as a whole. Raptor surveys would be completed in the harvest units, and any great gray owl or northern goshawk nest stands would be buffered and preserved during operations. Timing restrictions would be imposed to reduce disturbance during the breeding/nesting season. All road construction associated with timber harvest would be temporary and no new open routes would be established.

Of the 3,050 acres of prescribed fire treatments under alternative B that are proposed in sage grouse PPMA, only 720 acres are identified as sagebrush steppe habitat in landfire (refer to Appendix A, Map 12). The 262 acre Corral West unit is the only treatment that is sagebrush habitat that would currently support sage grouse, and it is heavily encroached with Douglas-fir. (See Photo of Unit Below) Although 458 acres of the remaining units are identified as sagebrush and are within PPMA, those areas are not providing habitat for sage grouse and are not considered suitable due to the proximity to timber near open parks. These treatments are designed to mimic natural processes and promote aspen regeneration and shrubby understory within timber and remove the colonizing Douglas-fir in the sagebrush steppe and will improve foraging conditions for elk and mule deer. Another 670 acres mapped within the PPMA are maintenance burns in the understory of past timber sales in Douglas-fir savannah habitat. This is not expected to have an impact on sage grouse as this habitat is currently unsuitable and unoccupied. Refer to Appendix D for species specific impacts.

Figure 4.4 Conifer expansion - Corral West unit, July 2014**Resource Concern #3: Wildland Urban Interface**

Residential development in the CW is limited and little new building is expected. Proposed non-commercial/prescribed fire treatments would reduce fuel loads and continuity across the landscape, allowing fire managers greater opportunity for protection of existing identified values within the Wildland Urban Interface should a wildfire event occur

The management of naturally occurring wildfire in the Centennial Mountains WSA will continue as defined in the Dillon RMP and Dillon Fire Management Plan. Fire is desired in this area and may be managed to improve vegetation and watershed condition. Suppression action will be initiated on fires that do not fall within defined parameters or are a threat to public safety or private property.

Resource Concern #6: Visual Resource Management

A small area (about 100 acres) on the west end of the planning area is identified for commercial timber harvest and a small prescribed fire in the area of Corral Creek (west) within a drainage approximately one mile from the county road where there is no legal public motorized vehicle access across private lands to the harvest unit. This area is within an area managed as VRM Class III. The objective for visual resource management in Class III areas is to “partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.” Due to the distance from the county road (the key observation point for visual resource impact analysis), the changes would be virtually unnoticeable to the casual observers in the area. The small amount of road work required (less than ½ mile) would also not attract the attention of passersby on the county road.

Some maintenance prescribed fire and conifer treatment burns are also proposed within this area of Class III VRM management in the Price Creek area west of the WSA. Most of this activity is in the area of relatively recent commercial timber sales near the Price-Peet Road. Since the

Price-Peet Road is a relatively well-traveled road, the key observation points for activities would be along this route. Proposed activities would certainly be noticeable to travelers along this route, but would certainly not “dominate the view” of the casual observer – the upper limit of permissible activities under Class III VRM objectives. The majority of the visual impacts in this area would be most noticeable for one to two growing seasons, at which point the changes to the existing landscape would be viewed as a part of the natural environment.

Several other prescribed burn units are proposed for portions of the Centennial Mountains WSA, which is managed for VRM Class I objectives. The primary objective for Class I areas is “preservation of the landscape.” However, the objective also provides for “natural ecological changes” and “limited management activity.” It also requires that the level of change should be very low and must not attract attention.

Most of the prescribed burning activity in the WSA is in very close proximity to the area that burned in and around the WSA in 2003 known as the Winslow Fire. That naturally ignited wildfire burned over 13,000 acres that is evident from the county road through the sagebrush-dominated rolling hills, and into the timbered slopes, mountains, and drainages that constitute the background of the visual landscape. The visual remnants of this fire are very much a part of the “natural ecological changes” that make up this landscape. Without the fairly aggressive fire suppression activities that occurred to provide some security for the nearby community of Lakeview, this 2003 fire would most likely have burned much of what is now being proposed to be burned as a means to restore a more natural fire-dependent landscape as well as a more natural role for fire in the future where concerns over the wildland urban interface will not require an aggressive fire suppression response to natural ignitions.

Over the short term, these proposed burned areas would attract some attention from the casual observer traveling the county road, but these areas would not stand out as an unnatural part of the visual landscape due to the presence of nearby areas that were burned under natural conditions. The current visual environment throughout this area is dominated by rolling hills dissected by drainages and intermittently vegetated by trees and shrubs creating a coarse visual texture. Timbered portions of the area range in color from juniper green to large red while the sagebrush dominated portions are a mix of shale green, brush brown and sand beige. Previously burned areas still have patches of black with green understory as grasses, shrubs, and timber are regenerating. There are also still both vertical and horizontal linear features associated with both standing and fallen trees.

If vegetation management activities in this area are conducted over a longer period of time (10-15 years), changes to the visual landscape would be more subtle, allowing time for regeneration of some timber stands, making smaller scale changes to the existing color and texture elements, and allowing for replacement of some of those elements prior to making additional changes. Many of the areas proposed for prescribed fire in this environmental assessment were proposed and approved when this watershed assessment was last evaluated approximately ten years ago. Since none of it has been done in the last ten years, it is likely that the proposed prescribed fire within this assessment would be implemented over a long period of time, and unlikely that the visual impacts of these incrementally implemented activities would exceed the visual resource management objectives for the area.

Approximately 268 acres near Lakeview, outside of the WSA, are proposed for commercial timber harvest followed by prescribed fire. The 268 acres proposed for harvest and burn are in the foothills of the mountains less than one mile from the county road through Lakeview. Up to two miles of temporary roads could be constructed for this harvest activity, and portions of the area may be broadcast burned after harvest activities are completed to meet fuel reduction objectives. Prescribed fire in the Lakeview area is almost entirely within the WSA, and therefore within VRM Class I. A small section of BLM lands outside of the WSA is within VRM Class II. The level of change in VRM Class II should be low, and management activities should not attract the attention of the casual observer. The VRM Class I objective “provides for natural ecological changes; however it does not preclude very limited management activity.” The Lakeview prescribed burn unit includes steep heavily timbered slopes dissected by the Shambo Creek, Odell Creek, and at least three other steep drainages. The multiple steep drainages dissecting this area would serve to limit the amount of total acreage visible from any key observation point along the county road. A prescribed fire would most likely occur only under such conditions that the entire stand would not be burned, but rather stringers up the drainages, leaving large patches of timber within the boundary of the burn unit. Under these conditions, the changes to the characteristic landscape would most likely not attract the attention of the casual observer, and would mimic “natural ecological change” which could be allowed even within the VRM Class I area.

Resource Concern #7: Wilderness Characteristics

Up to 5,205 acres are proposed for non-commercial mechanical/prescribed burning in Alternative B. Of those acres approximately 4,500 acres are within the Centennial Mountain WSA. Treatments within the WSA would be limited to primarily prescribed fire to ensure protection and enhancement of wilderness characteristics and values. These treatments are aimed at reducing the elevated fuel loads in areas where conifers have expanded into areas historically occupied by aspen and/or sagebrush. The expansion of conifers into these areas resulted from fire suppression activities as well as grazing activities that reduced the availability or density of fine fuels that would normally have carried wildfire into these areas, reducing the frequency of fires. Creating more manageable fuel loads in areas that historically received more regular wildfire activity would allow the area to be returned to a more natural fire regime. Attempting to return fire into an area that historically burned had fire would be consistent with the naturalness of the area and parallel wilderness characteristics.

Alternative C:**Issue #1: Riparian, Wetland and Aquatic Habitat**

Commercial forest harvests and non-commercial mechanical/prescribed fire treatments would take place in the Shambo Units, Price Creek, Fish Creek, Long Creek, Tom Creek, Morton Individual, and Peet Creek allotments (see Appendix A, Map #2). Non-commercial mechanical/prescribed fire treatment boundaries do not include riparian areas. We expect the same limited impacts to riparian areas as listed under alternative B. Also refer to predicted effects of these treatments to riparian habitat which are discussed in section 4.2.3(Predicted effects common to all action alternatives).

Issue #2: Upland and Sagebrush Steppe Habitat

Fuels reduction treatments utilizing prescribed fire and mechanical methods would occur on up to 8,850 acres of which only 262 acres are within sagebrush steppe habitat (Corral West Unit) that would be used by sage grouse. Although another 458 acres of habitat in PPMA type out as sagebrush, it is not suitable for sage grouse. The effects of these treatments are similar to those described above under Predicted effects mentioned in alternative B.

Issue #3: Forest and Woodland Health

Up to 579 additional acres of commercial harvest would be implemented in the Corral Creek and Antelope Creek drainages near Alaska Basin. The 448 acres identified for commercial harvest in Alternative B would also be carried forward for implementation (1,027 total acres). The silvicultural prescription and treatment objectives remain the same for all Action Alternatives.

In addition to the maximum of four miles of new temporary road construction identified in Alternative B, commercial harvest activity identified in Alternative C would require up to three more miles of temporary road construction, and two more stream crossings. If route designation changes on the Corral Creek road are implemented, one stream crossing of Corral Creek would be permanent. The predicted effects of these activities would be similar to effects described in Alternative B, but increased proportionally with additional acres and additional temporary roads and stream crossings.

Non-commercial/prescribed fire treatments within alternative C are designed to return fire to the landscape as a disturbance agent to improve resiliency and increase seral diversity, promote aspen, improve shrub understory, increase five-needle pine regeneration and maintain the Douglas-fir savannah that was restored in harvest units under the previous CW projects. These treatments would also promote diversity and improve forage conditions for big game species.

The additional non-commercial/prescribed fire unit in this alternative identified as “Shambo”, includes 3,635 acres. Objectives for this unit include returning fire to the landscape as a disturbance agent to improve resiliency and increase seral diversity at the landscape level through the use of prescribed fire. Specifically in the Shambo unit this would be achieved through attaining measureable fire effects on at least 60% of the identified area. Measurable fire effects would include reductions in existing fuel loads (tons/acre), flame lengths, and fire line intensities, associated with a change in existing fuel models. By reducing existing fuel loads and competition between targeted conifer tree species, five needle pine trees would be given a competitive advantage for new seedling establishment. The predicted effects of these activities would be similar to effects described in Alternative B, but increased proportionally with additional acres.

Issue #4: Special Status Species Habitat

The commercial harvest and non-commercial mechanical/prescribed burn treatments are expected to increase biodiversity and mimic natural processes. Much of the Centennial Mountains has had fire suppression over the past 100 years and forested habitats are overcrowded. The overall disturbance associated with the timber harvest under this alternative equates to less than .4% of the entire watershed. Selected removal of timber to restore aspen clones and Douglas –fir savannah may have short term impacts to some species on a localized

basis but would be beneficial to watershed health as a whole. Raptor surveys would be completed in the harvest units, and any great gray owl or northern goshawk nest stands would be buffered and preserved during operations. Timing restrictions would be imposed to reduce disturbance during the breeding/nesting season. All road construction associated with timber harvest would be temporary and no new open routes would be established. Impacts from prescribed fire would be the same as alternative B. Refer to appendix D for species specific impacts.

Resource Concern #3: Wildland Urban Interface

The predicted effects of the treatments are similar to those described above under Predicted effects of Alternative B.

Resource Concern #6: Visual Resource Management

In addition to the vegetation treatments proposed under Alternative B, an additional 579 acres in the Alaska Basin is proposed for commercial harvest under Alternative C. This includes up to three miles of new temporary road, and possibly blading or upgrading portions of the existing road system. It is likely that use of roads across adjacent private lands would substantially reduce the amount of new temporary road miles needed to access these areas for timber harvest.

All of the additional area proposed for harvest in this alternative lies within VRM Class II, which is managed to “retain the existing character of the landscape.” The objectives of this management class require that activities “...not be evident or attract the attention of the casual observer.” In order to assess this, key observation points were established along the county road at locations where passersby would most likely see the area that would be harvested. In most locations along this route, especially on the western end of the proposed activity, casual observers would be unlikely to notice the harvest activity due to the distance from the county road and the lack of any public access opportunities across private lands that separate the road from the harvest units. In addition, on the western portions of the proposed commercial harvest activity, private land timber harvest has already occurred and/or is planned in the near future. Harvest activities on the public lands beyond is likely to more nearly repeat the basic elements of form, line, color and texture in the surrounding landscape if they are selectively harvested as well.

In the eastern portion of the proposed activity under this alternative, near Corral Creek and Nemesis Mountain, harvest activities would be limited to dead and dying trees within 100 feet of the Corral Creek Road. This would eliminate any need for road construction or creation of skid trails, and would minimize the amount of standing timber cut through this area. Changes to the visual landscape from key observation points along the county road would be minimal, and would be consistent with management of this area according to VRM Class II objectives. Harvest activities proposed to occur further up the Corral Creek Road in the area where that road crosses Corral Creek and beyond, would not be easily visible to casual observers, and would likely meet the VRM Class II objective. Travelers from the west would be more likely to see activity in this area when they turn south on the county road, but the distance from the road, the narrowness of the drainage where the activity would occur, and other visual distractions in the foreground (houses) would minimize the visual impact of the harvest activity. Proposed harvest

activities on the upper end of the Corral Creek Road would be virtually unnoticeable to passersby on the county road.

Resource Concern #7: Wilderness Characteristics

Up to 8,850 acres are proposed to be burned under alternative C. Of the total proposed burned acres, approximately 7,850 acres are within the Centennial Mountain WSA. Treatments within the WSA would be limited to primarily prescribed fire to ensure protection and enhancement of wilderness characteristics. These treatments are aimed at reducing the elevated fuel loads in areas where conifers have expanded into areas historically occupied by aspen and/or sagebrush. The expansion of conifers into these areas resulted from fire suppression activities as well as grazing activities that reduced the availability or density of fine fuels that would normally have carried wildfire into these areas, reducing the frequency of fires. Creating more manageable fuel loads in areas that historically received more regular wildfire activity would allow the area to be returned to a more natural fire regime.

It is also possible that these fires could accomplish some of the objectives of the riparian conifer removal proposal, making that activity unnecessary.

4.2.8 Predicted Effects of Recreation and Travel Management Alternatives B & C Alternative B

Issue #1: Riparian, Wetland and Aquatic Habitat

The Corral Creek road is an existing road that was closed in the past. Although it would be reopened to the public to where it meets Corral Creek, under this alternative it does not cross Corral Creek or any riparian habitat along its path. The proposed road does parallel Corral Creek for about a mile. In short stretches, it comes within about 70 feet of the creek but the road is usually >150 feet from the Corral Creek. If the public is allowed to access this road, we would expect a limited amount of additional sediment to enter Corral Creek. However, the amount of sediment would be small because there would be at least a 70 feet buffer from the road to the Creek the entire length of the proposed road.

A boat ramp would be installed on the north side of Lima Reservoir (See Appendix A, Map 4). There would be a short (100-200') primitive access road to the reservoir from the main county road. We would expect some sediment to enter the riparian area of Lima reservoir during construction of the boat ramp and while the ramp is in use. Although we expect some additional sediment to enter into Lima reservoir and the adjacent wetland area, this is the only boat ramp on the north side of the large reservoir. We don't predict the additional sediment caused by the boat ramp construction and use to negatively impact Lima Reservoir and the associated wetland to scope and scale of the reservoir and the increased sediment.

BLM would begin maintaining an existing trail known as the Blair Loop Trail. This trail was once identified as part of the CDT, but the CDT designation has since been relocated and maintained to a higher standard. The Blair Loop Trail would continue to receive a lower level of maintenance than the currently designated CDT, but would be maintained to a minimal level to preserve the loop trail opportunity. By maintaining this additional Blair Loop Trail, the impacts (stepping on vegetation and some littering) from users on the CDT would be dispersed because some users would choose to walk the Blair Loop Trail rather than the CDT. We would expect

some additional disturbance to wildlife along the Blair Loop Trail but would expect fewer disturbances to the CDT compared to the no action alternative.

Issue #4: Special Status Species

Under this alternative the open road density would decrease by 2.3 miles on BLM lands in the CW. No impacts are expected to SSS species from the changes in open road designations around Lima Reservoir or the Wolverine Creek reroute. By designating 1.0 miles of existing route in Corral Creek in the Morton Individual SGC allotment it is anticipated that there could be an increase in conflicts between grizzly bears and recreationists. For further discussion refer to Appendix D - Wildlife Biological Evaluation.

Alternative C**Issue #1: Riparian, Wetland and Aquatic Habitat**

The Corral Creek road is an existing road that was closed in the past. Under this alternative, the entire Corral Creek road extending about one mile past Corral Creek would be re-opened to the public (See Appendix A, Map #4). The road would cross Corral Creek. In order to limit the amount of sediment entering Corral Creek with increased use by the public, a culvert or bridge would be installed. Although we would expect increased sediment input during the construction/installation of the bridge or culvert, we wouldn't predict any additional sediment after the bridge has been set and the vegetation has re-established. The road would add some limited sediment within a few feet of the new bridge but the road would then go in a perpendicular direction away from the Corral Creek. Therefore, the distance that the road would be close (<50') to Corral Creek would be roughly 50 feet. We would predict that the amount of sediment added to the stream within this 50 feet distance would be negligible.

Issue #4: Special Status Species

Under this alternative the open road density would decrease by one mile on BLM lands in the CW. No impacts are expected to SSS species from the changes in open road designations around Lima Reservoir or the Wolverine Creek reroute. By designating 2.2 miles of existing route in Corral Creek in the Morton Individual SGC allotment it is anticipated that there would be an increase in conflicts between grizzly bears and recreationist. For further discussion refer to Appendix D - Wildlife Biological Evaluation.

Resource Concern #5: Recreation and Travel Management

Under Alternative C, the Corral Creek Road would be open to public motorized vehicle use to the point where it was open until 2001. This would provide additional opportunities for public camping, especially during the hunting season. It would also increase opportunities for public hunting access by foot and horseback into this east end of the mountains, allowing hunters to be better dispersed both camping and hunting.

4.2.6 Comparative Effects for All Alternatives by Issue or Resource Concern

Table 4.3 Issue #1: Riparian, Wetland, and Aquatic Habitat (only allotments not meeting the Riparian Health Standard, or site-specific riparian issues or projects included).			
Allotment	Alternative A (No Action)	Alternative B	Alternative C
Antelope Peak #20179	Causes and conditions affecting public land resources would be perpetuated.	Improved riparian habitat health expected on Lentic reach #1750 that was rated FAR.	No Alternative C
Fish Creek #20172	Causes and conditions affecting public land resources would be perpetuated.	Improved riparian habitat health expected on about 3.0 stream miles rated FAR. Build two miles of fence to create a riparian pasture that would reduce livestock use on both reaches (314 and 315) and improve riparian condition.	Improved riparian habitat health expected on about 3.0 stream miles rated FAR. Build two miles of fence to create a riparian pasture that would reduce livestock use on both reaches (314 and 315) and improve riparian condition. Build 2.0 miles of fence to create interior pasture to reduce use on BLM lands on west half of allotment and improve riparian condition.
Long Creek AMP #20154	Causes and conditions affecting public land resources would be perpetuated.	Reducing use from 45 to 30 days in the west pasture would facilitate upward trend on about 1.0 mile of riparian habitat along West Creek. Build new livestock watering location with 1,000g trough away from West Creek to reduce grazing use on West Creek.	Construct about one mile of fence along the West Creek pasture boundary to separate private and BLM lands in the West pasture. Eliminating livestock grazing in the West pasture would more quickly facilitate upward trend on about 1.0 mile of riparian habitat on West Creek.
Morton Individual #20163	Causes and conditions affecting public land resources would be perpetuated.	Build 2.0 miles of fence to separate BLM from private lands. Reducing the grazing period to <15 days every other year would facilitate an upward trend on reach 1608 that is about 150 yards long.	Build 2.0 miles of fence to separate BLM from private lands. This fence would eliminate grazing for the next 10 years on BLM lands in the allotment. Eliminating livestock grazing in the would more quickly facilitate upward trend on about reach 1608.

Table 4.3 Issue #1: Riparian, Wetland, and Aquatic Habitat (only allotments not meeting the Riparian Health Standard, or site-specific riparian issues or projects included).

Allotment	Alternative A (No Action)	Alternative B	Alternative C
Red Rock #30636	Causes and conditions affecting public land resources would be perpetuated.	Re-Build one mile of dysfunctional fence so the <15 day grazing period and rest once every three years is followed in the Red Rock Pasture. Reduced grazing period and rest would facilitate upward trend on Red Rock River that is within BLM’s control (Lima Reservoir’s influence).	Re-Build one mile of dysfunctional fence so the private lands and BLM lands are separated in the Red Rock pasture. Re-building this fence would eliminate grazing for the next 10 years on BLM lands in the Red Rock pasture. Eliminating livestock grazing in the Red Rock pasture would more quickly facilitate upward trend on the riparian reach.

Table 4.4 Issue #2: Upland and Sagebrush Steppe Habitat (only allotments not meeting the Upland Health Standard, or site-specific upland issues or projects included).

Allotment	Alternative A (No Action)	Alternative B	Alternative C
Morton Individual	Causes and conditions affecting public land resources would be perpetuated	Overgrazing in the allotment would be eliminated with the new fence separating private and BLM lands. Restricting the grazing to <15 days every other would improve upland health and vigor. Habitat responses anticipated include: the abundance and vigor of plants in key functional-structural groups would increase; bare ground and plant interspaces decrease; soil surface resistance to wind and water erosion would improve; litter would replace bare ground; total plant biomass production would increase and invasive species would decrease.	The affects would be similar to Alternatives B except without any livestock grazing competition habitat improvements would happen sooner.

Table 4.4 Issue #2: Upland and Sagebrush Steppe Habitat (only allotments not meeting the Upland Health Standard, or site-specific upland issues or projects included).			
Allotment	Alternative A (No Action)	Alternative B	Alternative C
Red Rock #20163	Causes and conditions affecting public land resources would be perpetuated	Anticipated positive affects to upland habitat attributes would include: reduction in the size of water flow patterns, decreased plant pedestals, reduced bare ground, less litter movement and an increase to biomass production.	The positive effects in Alternative B would be realized more quickly without any competition from livestock grazing.
Rody Individual #20685	Causes and conditions affecting public land resources would be perpetuated	Shortening the grazing season to 60 days we would expect positive affects to upland habitat such as: improved soil resistance to erosion, improved infiltration of soil, increased key plant species, reduction in the size of water flow patterns, decreased plant pedestals, reduced bare ground, less litter movement and an increase to biomass production.	No Alternative C

Table 4.5 Issue #3: Forest and Woodland Habitat (Non-commercial Mechanical/Prescribed Fire and Commercial Harvest Treatments).			
Treatment Type	Alternative A (No Action)	Alternative B	Alternative C
Commercial Harvest	Causes and conditions affecting public land resources would be perpetuated	Increase age-class and structural diversity, increase resilience to future insect and disease outbreaks, increase in aspen, decrease in intra-stand competition, decrease fuel loading on up to 448 acres.	Effects would be similar to those described in Alternative B, on up to 1,027 acres.
Non-Commercial Mechanical/Prescribed Fire	Causes and conditions affecting public land resources would be perpetuated	Increased seral stage and structural diversity at landscape level, increase aspen and DF savannah, restore sagebrush steppe habitat, promote 5NP. Return fire as a natural disturbance to watershed. Up to 5,205 acres would be treated.	Effects would be similar to those described in Alternative B on up to 8,850 acres

Table 4.5 Issue #3: Forest and Woodland Habitat (Non-commercial Mechanical/Prescribed Fire and Commercial Harvest Treatments).

Treatment Type	Alternative A (No Action)	Alternative B	Alternative C
Predicted Effects to Wildlife	Continued loss of open parks in timber stands leading to loss of big game forage, loss of aspen and sagebrush habitat due to colonization of Douglas-fir	Improve foraging for big game, maintenance of sagebrush steppe habitat aspen clone and Douglas-fir habitat would benefit a myriad of wildlife species.	Similar to alternative B, but on a larger scale with the addition of the Shambo unit and AK Corral commercial timber unit.

Table 4.6 Issue #4: Special Status Species Habitat (Habitats are expected to remain in the condition and along the same trends under the No Action Alternative.).

Allotment	Alternative B	Alternative C
Antelope Peak #20179	Improved sage grouse brood rearing habitat and migratory bird nesting due to riparian enclosure with ten years rest from grazing and seeding of forbs in uplands where unauthorized spraying occurred. Riparian fence could cause wildlife collisions.	No Alternative C
Cocanougher #10738	After long term rest, introducing alternating grazing every other year in spring or fall would remove some of the residual cover. Short duration late season grazing would still be compatible with nesting swans, depending spring use dates, disturbance during nesting season could occur.	Longer grazing period and no rest for three years is expected to leave less residual nesting cover. BLM would have to re-assess are after 3 years to determine if it is meeting habitat objectives.
Fish Creek #20172	Riparian fence (@2 miles) could cause wildlife collisions. Short duration grazing (5 days) in riparian pasture every other year is expected to be compatible with sage grouse, brood rearing condition for with in riparian pasture would improve. Decreasing AUMs and reducing fall use to 18 days is expected to leave more residual herbaceous cover and thereby improve nesting cover for sage grouse	Construction of riparian pasture would be the same as Alt. B. Constructing new fence to create a separate pasture would improve nesting habitat for sage grouse, sage thrasher hiding cover for pygmy rabbits and other sagebrush obligates, but the extra 2.0 miles of fence increases the risk of wildlife collisions.
Long Creek AMP # 20154	Reduced AUMs and grazing duration along with introducing rest every third year is expected to improve brood rearing habitat for sage grouse and nesting cover for migratory birds. Grazing management change would improve West Creek riparian/fishery habitat and downstream habitat for arctic grayling.	Ten years of rest would allow for improved riparian conditions as well as improve nesting cover for sage grouse and sage thrasher in the uplands in the West pasture as well as hiding cover for pygmy rabbits. The rest would improve West Creek riparian/fishery habitat.
Morton Individual SGC #20163	Designating 0.9 miles of existing route as open could increase potential conflicts with recreationists, however, the existing road is already getting used by hikers.	Increased disturbance and potential conflicts with grizzly bears due to designating 2.2 miles of open route in grizzly bear habitat. Timber harvest would increase biodiversity by restoring Douglas-fir savannah habitat and promoting aspen regeneration.

Table 4.6 Issue #4: Special Status Species Habitat (Habitats are expected to remain in the condition and along the same trends under the No Action Alternative.)		
Allotment	Alternative B	Alternative C
Peet Creek #10730	Beaver mimicry structures would reduce sediment within the East Fork Peet drainage resulting in improvements in pool quality and WCT spawning habitat	No Alternative C
Red Rock #30636	Periodic rest from livestock and fencing improvements would improve riparian habitat for potential nesting of trumpeter swans, waterfowl and migratory birds.	Long term rest would improve riparian habitat for potential nesting of trumpeter swans and removes any disturbance associated with grazing. Improved nesting habitat for riparian obligate migratory birds by increasing riparian woody species.
Rody Individual #20685	The reduction in grazing period and deferred use eliminates disturbance during the nesting season for migratory birds and allows for increased residual cover for ground nesters and improve brood rearing habitat for sage grouse.	No Alternative C
Shambo Units #20152	Reduce sediment issues associated with a degrading road crossing and improve overall riparian health by reducing conifer encroachment into riparian meadow habitat.	No Alternative C

Table 4.7 Resource Concern #2 Wilderness.		
Alternative A	Alternative B	Alternative C
There would be no immediate or noticeable changes to the wilderness characteristics in the short term, although longer term ecological changes would continue to occur, some of which would be influenced by outside, unnatural forces such as fire suppression, loss of fine fuels due to cattle grazing, and unnatural expansion of conifers due to both of the above.	Whitebark pine planting, beaver dam mimicry projects, prescribed fire, and riparian vegetation projects would influence wilderness characteristics as described in the analysis in Chapter 4.	No Alternative C.

Table 4.8 Resource Concern #3: Recreation and Travel Management.		
Alternative A	Alternative B	Alternative C
No changes to existing route designations or facilities.	Motorized routes designated open to public use would be more accurate and reflective of the routes used and available to the public. Improved route into Wolverine Creek would restore the public access that was once provided. Installation of culverts on Fish Creek would improve recreational motorized use along that route. Opening the Corral Creek Road up to the creek crossing would enhance camping and access opportunities for the public. Adding the Blair Lake loop trail to the maintenance list would ensure the opportunity for the use of this trail for the future horseback and hiking users.	Same as Alternative B except that Corral Creek Road would be opened to the point where it was open until 2001. This would extend opportunities for camping and hunting access by foot and horseback, and better disperse hunters in this end of the valley.

Table 4.9 Resource Concern #4: Socioeconomics.		
Alternative A	Alternative B	Alternative C
The BLM no action alternative would perpetuate whatever influences current management activities are having on the local/regional socioeconomic environment.	Revising management by reducing duration of use, adding more rest, or reducing AUMs may increase costs to the lessee. Constructing the structural projects in this alternative would require an investment from the BLM and the lessees. Proposed projects may create job opportunities for local individuals. The commercial timber harvests would provide employment and short term economic stimulus to the regional economy.	The shortened seasons of use and increased rest proposed in this alternative would have a higher cost to grazing lessees. Fewer structural projects are proposed so the costs of materials and labor would be less than under Alternative B. The commercial timber would provide employment and short term stimulus to the regional economy

Table 4.10 Resource Concern #5: Wildland Urban Interface.		
Alternative A	Alternative B	Alternative C
Cooperative projects aimed at reducing fuel loads in and around the town Lakeview, MT of would not occur making it more susceptible to a wildfire.	This alternative would reduce fuel loading through the use of prescribed fire and commercial harvest on up to 5,653 acres (5,205 burning and 448 acres commercial harvest).	This alternative would reduce fuel loading through the use of prescribed fire and commercial harvest on up to 9,877 acres (8,850 acres burning and 1,027 acres commercial harvest).

Alternative A	Alternative B	Alternative C
No management actions would occur that would require visual resource analysis.	All proposed activities would be consistent with objectives for the areas they are located.	Same as Alternative B except that some additional timber harvest activities would occur in the east end of the valley near Corral Creek Road. The limited harvest proposed under this alternative would also be consistent with VRM Class II objectives.

4.3 Cumulative Effects for All Alternatives

Cumulative effects are those that result from adding the anticipated direct and indirect effects of the proposed action, to impacts from other past, present and reasonably foreseeable future actions. These additional impacts are considered regardless of what agency or person undertakes such actions. The cumulative impacts area for this EA is defined as all land, regardless of ownership, in the CW assessment area (map 1) for all issues and resource concerns except Socioeconomics, for which the cumulative impacts area is Beaverhead County. Climate change is analyzed at the regional level. The temporal boundary when analyzing cumulative impacts is 10 years. Some past, present and reasonably foreseeable actions are discussed in Chapter 3 (Affected Environment) and/or Chapter 2 (Features Common to all Alternatives).

The IDT also incorporated the data from the Middle Rockies Rapid Eco-Regional Assessment (REA) and used this data to help give context and prioritize issues within the CW, as well as understand cumulative effects at multiple scales. The REA was most important to determine which conservation element (i.e. wildlife corridors, cold water fishery habitat) was important at a regional scale. Even though the cumulative impact area for this EA is the Centennial Watershed, the REA data has given the IDT a better perspective on lands outside the Watershed Assessment boundary and how our actions and decisions would affect issues or resources concerns at the regional level (i.e. make incremental progress towards mitigating regional resource issues).

4.3.1 Past and Present Actions

Past or ongoing actions that are common to all alternatives and affect current resource conditions in the CW are shown below.

Middle Rockies Rapid Eco-regional Assessment (MR-REA)

Ecoregions span across all administrative boundaries and encompass areas much larger than those managed by individual BLM field offices. Assessments of these larger areas provide land managers additional information and tools to use in subsequent resource planning and decision-making.

At the ecoregional level, REAs aid in developing broad-level land management strategies within the ecoregion. The information, maps, and tools provided by the REAs provide regional trends and strengthen BLM's analyses of the potential and cumulative effects of proposed actions within assessment areas and the Middle Rockies Eco-region. Within the CW, the MR REA data

and information has helped give context to local issues and provided information, such as regional trends, to help the IDT prioritize issues in the CW and put them in context with multi-scale and regional issues.

The IDT has selected key conservation elements and change agents from the MR REA to compare to issues in the CW. These comparisons are shown below.

Riparian Area Distribution: REA data shows that riparian areas cover about the same (3%) of the land area in the CW as the entire Middle Rockies Eco-region. It is important to note that at the Level 4 ecoregion boundary, riparian area covers 2x as much land (8%) as both the Middle Rockies Ecoregion and the CW.

Severe over-trapping of beavers and unregulated livestock use during the late 1800s and early 1900s changed the character (hydrological and vegetative) of most mountain streams and riparian areas in the Intermountain West (Elmore and Beschta, 1987; Elmore and Kaufman, 1999; Naiman, 1988). Although there are still active beaver colonies in the watershed, activity is substantially reduced from historical levels.

Figure 4.5 Historic Aspen Beaver Dams in areas now dominated by conifers - Shambo Units Allotment, July 2014.



Impacts on lands upstream from BLM administered land may contribute sediment to streams and subsequently may adversely affect downstream water quality on public land. Road use and maintenance adjacent to streams have impacted some streams and riparian areas in the watershed by adding sediments and/or removing vegetation at the crossing or adjacent to the stream.

Coldwater Fish Assemblages: REA data shows that the CW is a stronghold for cold water fishery habitat with most of the watershed rating good to fair for cold water fishery habitat. Regionally, the CW is surrounded by poorer condition cold-water fishery habitat that can be found in northeast Idaho and areas west of Helena, Montana. This shows the importance of maintaining and/or expanding and improving fishery habitat within the CW.

Introduction of non- native sport fish in the early-mid 1900's has resulted in the loss of most populations of native WCT within the watershed. Recent efforts have begun to re-introduce native WCT back into historic habitat.

An ongoing multi-agency WCT re-introduction project is taking place within the Peet Creek drainage. Although the habitat is well suited for WCT, brook trout and non-native hybridized trout species dominated the stream. This re-introduction project, when completed will restore genetically pure WCT to ~ 6 miles of historic habitat.

MT FWP, USFWS, The Nature Conservancy and other cooperators have been working together to improve fluvial arctic grayling habitat within the Centennial Watershed on lands not managed by BLM for the past decade.

BLM recently (2013) completed a riparian conifer treatment adjacent to approximately $\frac{3}{4}$ miles of stream within the Bean Creek drainage to improve WCT habitat. The project was to reduce conifer expansion into or near the riparian area in an effort to improve habitat for WCT. Additionally, the USFWS completed a stream channel restoration project on approximately 1500 feet of Bean Creek located on private land downstream of BLM to also improve WCT habitat.

BLM is proposing to improve cold-water fishery habitat on Fish Creek, Long Creek and Peet Creek and Shambo Units grazing allotments in both alternatives B and C. Alternative B proposes to improve 15 miles of streams by revising the grazing systems and/or installing new fences to create additional pastures or riparian exclosures. Alternative C proposes to improve 18 miles of streams by revising the grazing systems and/or installing new fences to create additional pastures or riparian exclosures. Both alternative B and C would allow streams additional rest from livestock use. The cold water fishery streams would benefit from the rest by, a reduction in the amount of bare ground along stream banks, allowing riparian plants to complete their life cycle without herbivory in multiple years and lessen the impacts of hoof action on stream banks.

Forested Areas with in the CW and the MRREA

Exclusion of fire from the landscape has resulted in the increase in accumulation of fuel loads and altered forest conditions by facilitating a younger cohort of Douglas fir in the understory resulting in denser forest stands.

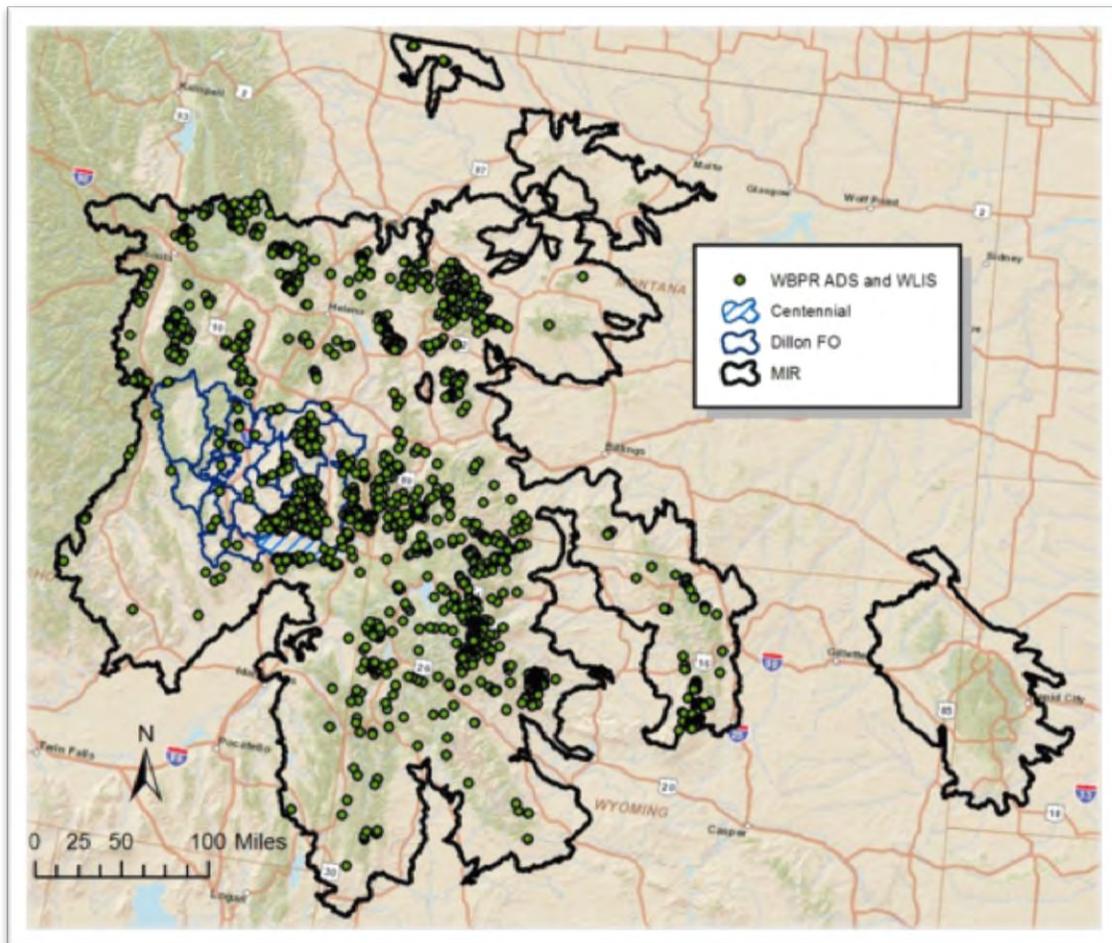
Five Needle Pine Assemblages: REA data shows that five needle pine trees (FNP) are mostly found on the southern border of the CW and make up about 3% of the total land in the CW. However, looking at the level four eco-regional boundaries, about 8% of the land is covered by Five Needle Pine trees. REA data shows that the FNP in the Centennial Mountains are influenced by mountain pine beetle and white pine blister rust infestations, recent fire regimes

changes, climate change and succession. The CW FNP tree population is within the GYE Five Needle Pine Tree population stronghold.

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

White Pine Blister Rust: REA data shows that White Pine Blister Rust (WPBR) is found throughout most of the Middle Rockies REA region including the CW. However, the lowest occurrence near the CW is in the area to the west of the CW. Heavy occurrences are found on the northern edge of the CW and to the east and south.

Map 4.1 Current Presences of White Pine Blister Rust in the MIR



Current Status of Evergreen Forests: The REA assigned a ranking of Good, Fair or Poor based on forest insect infestations and departure from simulated historical vegetation reference conditions. Currently, approximately 36% of the evergreen forest in the Middle Rockies ecoregion is rated as Poor, compared to 93% of the Centennial watershed evergreen forest in the same rating using REA data. Though forest insect activity appears to be decreasing in recent

years, the ongoing infestations, combined with high VCC departure, contribute to the 93% Poor rating.

In 2011-2013, BLM completed approximately 870 acres of commercial timber harvest which was identified for treatment in the 2005 Centennial EA. About 730 acres was harvested in the Price Creek drainage, and about 140 acres in the Bean Creek drainage. This harvest activity required the construction of 4.6 miles of new temporary road, all of which has been physically closed to all motorized vehicle use. Excluding the recent BLM harvest in Price and Bean Creeks, since the early 1980s the BLM has implemented about 360 acres of commercial harvest within the CW.

Since the early 1980s, Montana DNRC has completed approximately 600 acres of commercial harvest on state-managed land within the CW. Additionally, an unknown acreage of state-managed land in the Bean Creek drainage was harvested in the 1970s. Commercial harvest on state-managed land in Odell Creek is ongoing and is expected to total approximately 220 acres. An unknown acreage of forested land has been harvested on USFS-administered land on the northern and eastern portion of the CW, and on private land throughout the CW.

In 2012-2013, BLM implemented approximately 500 acres of non-commercial conifer cutting and girdling treatment in the Price and Bean Creek drainages. The objectives of these treatments were to promote upland aspen regeneration and deciduous riparian woody vegetation, and reduce competition and fuels around large diameter (≥ 24 "DBH) Douglas-fir trees. Follow-up pheromone treatments in these project areas are ongoing to reduce bark beetle impacts within the treatment areas and surrounding forest.

There has been post and pole utilization, Christmas tree cutting, and firewood collecting throughout the CW in the past. Cumulatively, these projects have increased biodiversity (vegetative, structural and seral) at the landscape level and increased resiliency in the forest and woodland habitat.

Watershed-wide under all management schemes on all land ownerships, there has been and continues to be a decline in aspen. This is a western United States wide phenomenon that can be attributed primarily to a combination of successional processes including reduction (or elimination) of fire, loss of predator influence on herbivores, and long-term overuse by ungulates (Bartos and Campbell, 1998; Beschta, 2003; Ripple and Beschta, 2004).

Fire Risk Rating: When generally comparing the Middle Rockies Ecoregion and the Centennial Watershed Assessment area using REA data, the Middle Rockies region has a lower overall departure and a lower risk for wildfire with about 42% of the ecoregion in the high risk category (See Map 2 CW Assessment Report). The Centennial Watershed area has a higher departure rating overall as more than 56% of its land area is in the high departure category signaling that more of the area is at a higher risk for wildfires.

Spotted Knapweed: REA data shows that the CW has low occurrence of spotted knapweed (Map #6 Centennial Watershed Assessment Report) although heavy spotted knapweed potential for invasion exists in the Bitterroot region of Montana and in Idaho. REA data points out that

the greatest risk for invasion in the CW is along roads or in any human disturbed areas.

Cheatgrass and Sage Grouse: Areas have been identified within the Middle Rockies Ecoregion that show priority habitat for sage grouse. Priority habitat is generally defined as areas occupied by sage grouse for at least a portion of their life cycle. When generally comparing the Middle Rockies Ecoregion and the Centennial Watershed, REA data shows that has 53% of the sage grouse priority land acres in the entire Middle Rockies Ecoregion are at high risk for cheatgrass establishment while just 21 % of the high priority acres in Montana are at high risk for cheatgrass invasion.

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

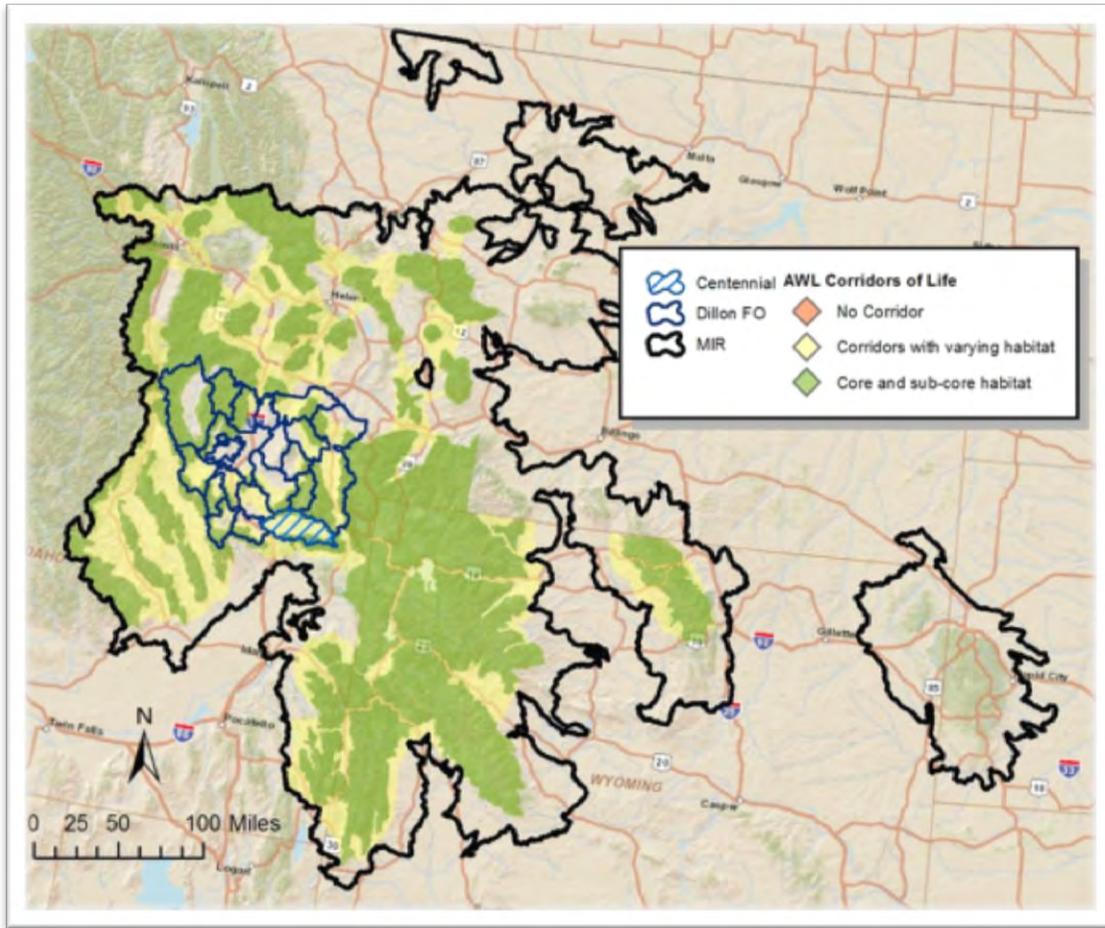
Wildlife Distribution in the CW and MRREA

Megafauna in the CW and the MR REA area vary greatly in their distribution and population sizes. Wildlife data compiled in the REA focuses on species of concern, large carnivores and big game species.

Large Carnivores Corridors: The REA data shows that the CW is a corridor between the GYE and the Northern Continental Divide Ecosystem. From a regional perspective, it is a narrow corridor that is important because no corridors exist to the north and the south of the CW. REA data supports the importance of the CW to the movement of large carnivores from east to west.

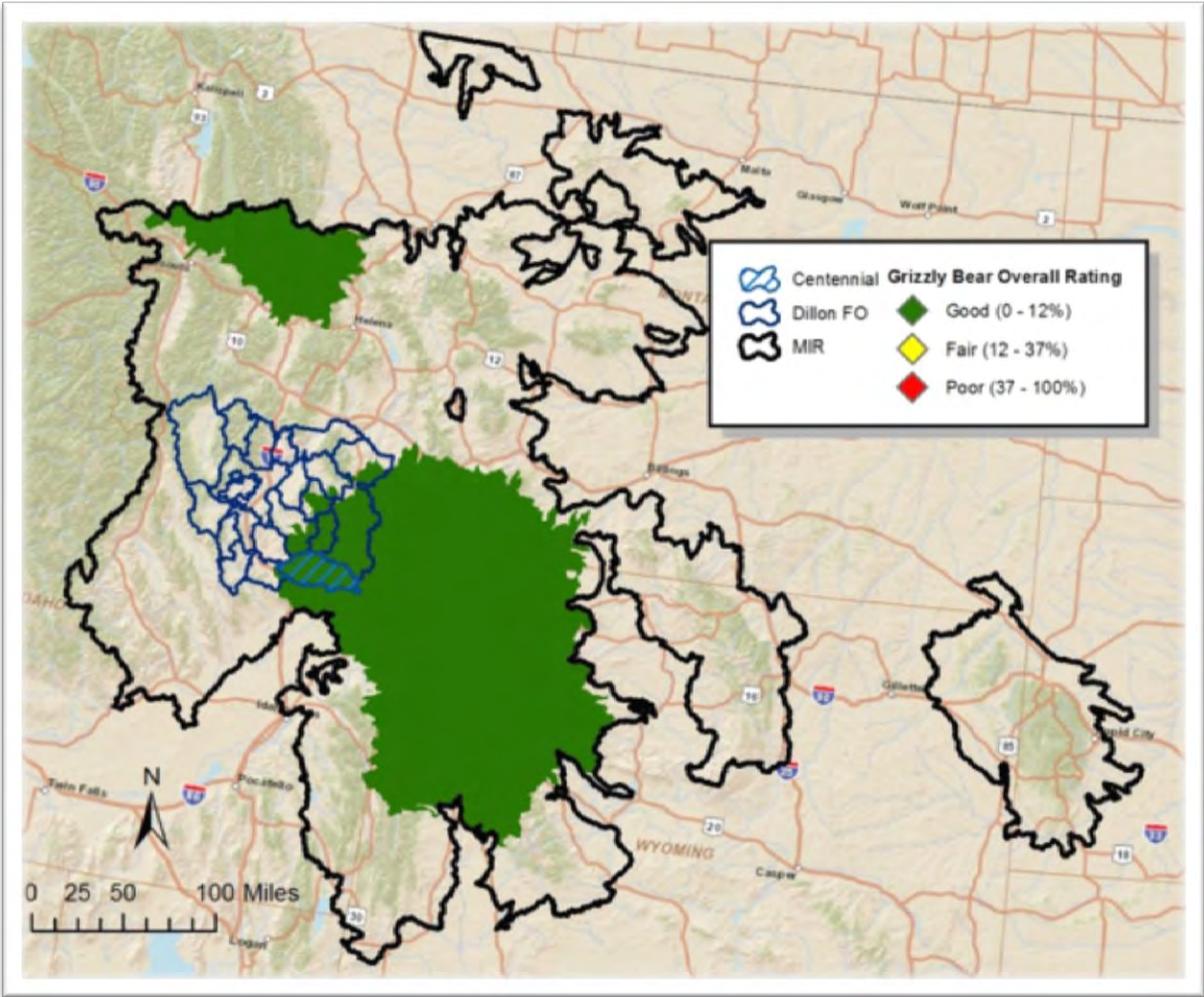
In the late 1890's and early 1900s, wolves and other large predators in the western United States were hunted, trapped and poisoned nearly to extinction. Ripple and Beschta (2005) indicate that the presence of top trophic level predators significantly affects herbivores and that this interaction alters or influences vegetation (aspen, willow, cottonwood). The reintroduction of wolves into Yellowstone National Park in 1995 and subsequent increase in wolf numbers in southwest Montana may have an effect on reversing these impacts.

Map 4.2 Large Carnivore Corridor Habitat in the MR REA

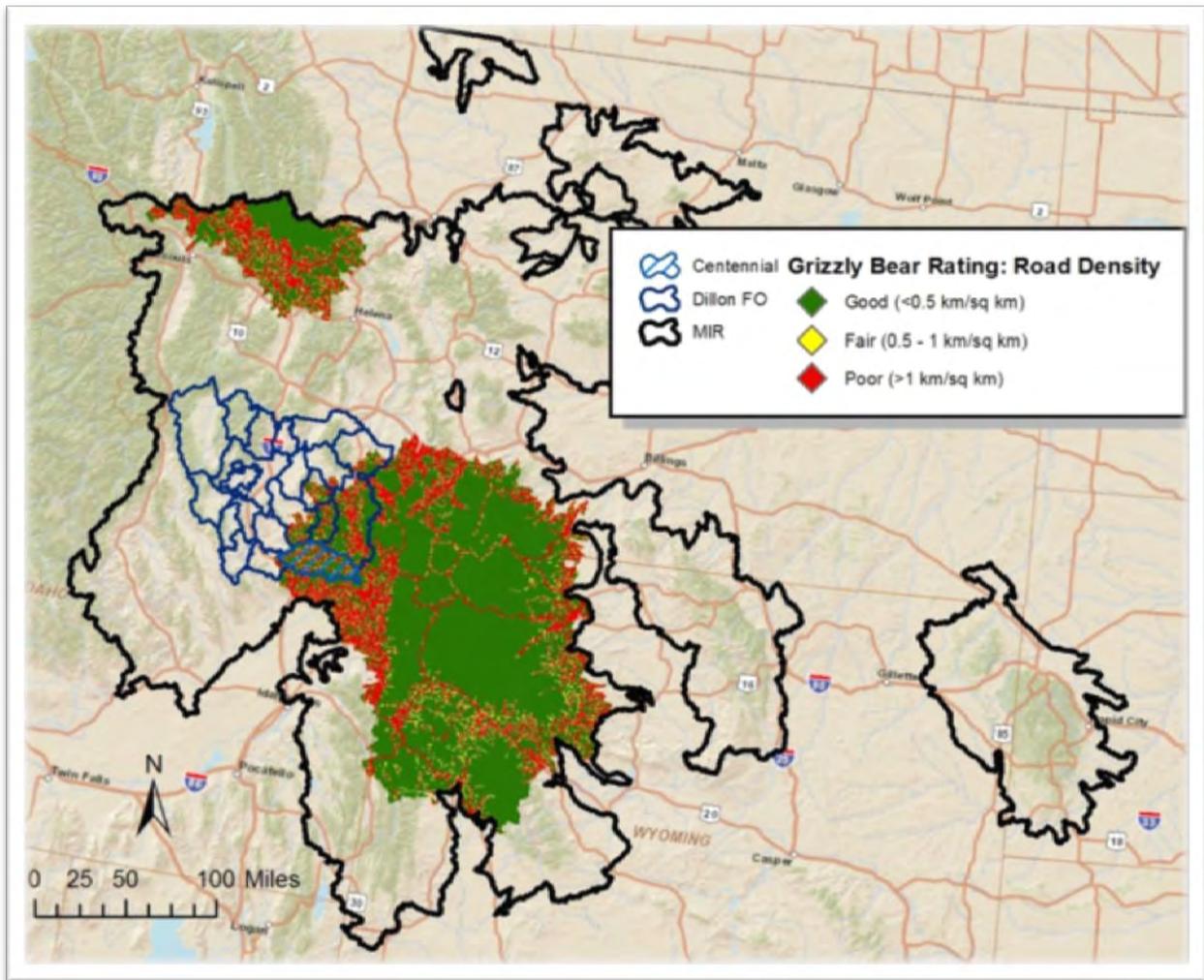


Grizzly Bear Distribution: REA data shows that the CW is on the western edge of grizzly bear distribution. Grizzly bears are found east, north and south of CW. REA data points out that areas west of the CW are likely areas where grizzly bears may attempt to expand their distribution. The CW provides a key corridor for this potential home range expansion and seasonal or permanent habitat.

Map 4.3 Grizzly Bear Distribution in Middle Rockies REA



Grizzly bears are particularly sensitive to vehicle road densities and any new road construction. The REA data shows that the CW has a low road density as shown below.

Map 4.4 Grizzly Bear Rating for Road Density**Other Past and Present Actions**

Livestock grazing has occurred within the watershed since the 1860s. Until the passage of the Taylor Grazing Act in 1934, livestock grazing was unregulated and overgrazing on the public lands was rampant. Livestock grazing management has become increasingly more intensive as other resource values and uses have become more important over the years. Livestock grazing occurs on private, state and federally managed lands within the watershed.

Recreational use has occurred, will continue to occur and is expected to increase within the watershed in the future. Increased recreation has adversely impacted isolated areas within the watershed (camp sites, new trails and roads, spreading of weed seed, etc.).

There are some historic mining impacts in the CW. The most prominent one is the old phosphate mine and associated road in the Odell Creek drainage. Refer to Centennial Watershed Assessment (pages 18 – 20).

Irrigation of private lands has been occurring in the valley since the late 1800s. Irrigation practices have changed the character of streams once they reach the valley floor and are diverted for irrigation. Irrigation practices have also changed the location and amount of wetlands in the valley. Lima Reservoir stores water for downstream irrigators. Water fluctuations in the Reservoir are extreme due to irrigation demand in the spring and early summer.

The Centennial Valley Association (CVA) is an association of private landowners in the valley working together to reduce conflicts between predators and livestock (e.g. range rider program), increase community communication about wildlife, inventory and treat noxious and invasive plant species throughout the valley and host educational workshops in the valley with the goal of increasing sustainability of the CVA.

Reasonably Foreseeable Future Actions

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

Impacts resulting from grazing, vegetative projects and/or recreation on private and State lands, which are not subject to BLM Standards, would continue. This could affect wildlife migration and dispersal depending on timber harvests planned on State and private lands in the future. Any reductions in AUMs on BLM lands would increase grazing use on private or state land within the watershed if herd numbers remain consistent. Fencing on other land ownerships and on BLM boundaries may lessen the benefit of fence modification efforts on public lands to improve wildlife movements.

Recreation, especially hunting and fishing, is expected to increase in the CW in the future. Impacts expected from this increased use are new camp sites, spreading of weed seed, more use of roads, increased wildlife disturbance and increased conflicts with wildlife.

Food storage orders will be implemented in the DFO within the GYE. These will most likely be implemented within the next year anticipating the USFWS finalizing the delisting process for grizzly bears. When implemented, this would be expected to minimize conflicts between grizzly bears and recreationists.

Decreases in mountain big and three tip habitat through Douglas-fir expansion can be anticipated. In areas that are treated to remove competing conifers, the seral stage of sagebrush steppe habitat would be set back to early seral and would take up to 30 years to progress back to late seral plant communities. This creates seral stage and structural diversity within sagebrush habitats across the landscape.

Montana DNRC intends to implement approximately 670 acres of commercial timber harvest in the near future in the Bean and Sand Creek drainages and may have a timber sale in Corral Creek.

Red Rock Lakes National Wildlife Refuge is currently proposing a fuel reduction and aspen restoration/maintenance treatment on up to 350 acres of refuge-administered land east of Lakeview, in the Amelia Creek drainage. This proposed project would include the commercial

removal of conifers, and is adjacent to BLM's Amelia Creek commercial harvest unit identified in Alternatives B and C.

The potential for wildfire ignitions on all ownerships will continue. The appropriate fire management response will be implemented on federally-administered lands throughout the watershed based on relative values to be protected commensurate with fire management costs. The long-term benefits of fire will also be considered on case-by-case basis.

MT FWP, USFWS, Nature Conservancy, BLM and other cooperators will continue grayling habitat improvement projects within the CW. Allotment management changes implemented by the BLM to improve riparian habitat upstream or downstream of these areas would have a beneficial effect on these grayling habitat projects. Cooperative efforts between the State, FS and BLM to expand and re-establish WCT and arctic grayling populations by improving existing habitat within the CW would be expected to continue during the next five to ten years. The BLM will continue to monitor WCT habitat, populations and long term stream temperatures within the CW.

After assessing the restoration potential of all drainages within the Centennial Valley, MT FWP and BLM have identified O'Dell Creek as the priority drainage for WCT restoration within the Centennial Watershed. This is based in part, on barrier site potential, length of habitat restored, and potential WCT population size.

The BLM intends to work with MT FWP within the next year to analyze the installation of a fish barrier in the O'Dell Creek drainage to allow for restoration of native WCT. Completion of a fish barrier within this drainage would allow for the re-introduction of WCT to nearly 30 miles of historic habitat, potentially supporting the largest population of genetically pure WCT in SW Montana. Due to the remoteness and topography of the O'Dell Creek drainage, locations to construct a fish barrier are extremely limited. Within the O'Dell Creek drainage, all suitable barrier locations are located on BLM administered land within the Centennial Mountains WSA. A portion of the drainage upstream of the barrier would be chemically treated to remove existing non-native trout populations so that pure WCT can be restored. Chemical treatment of non-native fish would be analyzed by MT FWP in a future document prior to any barrier construction.

High probability habitats will be surveyed for sensitive plants prior to any ground disturbing activities of federal land but botanical surveys aren't required on private and state lands even on cooperative projects.

The economic situation of the lessees is affected by changes in cattle prices, hay prices, fuel prices, interest rates, land prices, labor costs, labor inputs, equipment costs, equipment maintenance costs, facilities maintenance costs, costs of feed supplements, irrigation costs and availability of irrigation water, livestock loss, private land lease rates, veterinary costs, local weather and other miscellaneous factors. Cumulative economic impacts could influence grazing lessees to subdivide private land to maintain economic viability. Substantial sub-dividing of private land within the watershed is expected to continue or increase in the foreseeable future. Land use patterns on private and public lands in Madison County are changing. As traditional agricultural lands are converted to residential and recreational properties fewer large scale

ranching operations remain. Access to public land across private land is becoming more restricted and will likely continue as traditional ranches are subdivided into smaller parcels.

Livestock production and sustainability will continue to be important in Beaverhead County and the State of Montana. According to the 2012 Revision of the official United Nations World Population Prospects, the world population of 7.2 billion in mid-2013 is projected to increase by almost one billion people within the next twelve years, reaching 8.1 billion in 2025, and to further increase to 9.6 billion in 2050 (UN 2013). Given this projection, food security is and will continue to be an important issue and livestock are integral to addressing food security. The United Nations Food and Agriculture Organization (UNFAO), on their Livestock and the Environment webpage project “growing populations, rising affluence and urbanization are translating into increased demand for livestock products, particularly in developing countries. Global demand is projected to increase by 70 percent to feed a population estimated to reach 9.6 billion by 2050” (UNFAO2014). Livestock production and sustainability, as well as food security, will continue to be important issues locally, regionally and globally.

Climate change may also impact food production. The USEPA, citing papers published from 2007 through 2009, predicts several impacts of climate change on agriculture and food supply. Moderate warming and more CO₂ may help plants grow faster, however these effects may be offset by severe warming, floods and drought. Livestock production may be reduced. Livestock may be at risk directly by heat stress and indirectly from reduced quality of their food supply (USEPA, USGCRP 2009). Forage quality in pastures and rangelands generally declines with increasing carbon dioxide concentration because of the effects on plant nitrogen and protein content, reducing the land's ability to supply adequate livestock feed (USGCRP 2009). Livestock production is a major contributor to “climate change, air pollution, land, soil and water degradation and to the reduction of biodiversity.”(Steinfeld et al.2006). The Bureau of Land Management recognized this fact with the passage of the Taylor Grazing Act and subsequent legislation. In Livestock’s Long Shadow: Environmental Issues and Options (Steinfeld et al. 2006), mitigation measures that would reverse soil organic carbon losses and reduce enteric CH₄ emissions are discussed. Alternatives B and C would implement the recommended mitigation measures applicable to Public Land Grazing: improved grazing management, providing appropriate water sources and improving water quality.

4.3.2 Cumulative Effects of All Alternatives, Including the No Action

The intermingling of private and state lands with public lands throughout the watershed ensures that activities outside the control of BLM will continue. Grazing on these lands at various times throughout the year will influence forage and cover availability, and distribution of seasonal wildlife uses.

Development and population growth in the Centennial Valley may increase slowly and may continue to cause some wildlife habitat fragmentation (roads, utilities). Other impacts may include: higher levels of vehicle traffic, newly established or expanded areas of noxious and invasive species, reduced open space, increased outdoor recreation, difficulty in obtaining access to public land, and perhaps an increased demand for water.

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

The loss of forest canopy and cover, due to insect and disease mortality, is likely to continue across all ownerships in untreated forested habitat resulting in the accompanying change in wildlife habitat. Large-scale mortality of trees across forested portions of all ownerships within the CW may increase annual stream flows and change the timing of water delivery, due to decreased water uptake by trees and reduced interception of precipitation resulting from the loss of canopy (Colorado State Forest Service, 2009).

Large amounts of large woody debris are expected in and along riparian reaches in forested habitat as dead and dying trees fall. These reaches are primarily steep, narrow valley types (A channels). This will reduce or eliminate both big game and livestock access along these reaches which will reduce or eliminate any impacts from grazing along these reaches and increase use proportionately on adjacent accessible reaches. Increased woody debris in these stream reaches will increase step pool habitat and sediment storage along these areas. Additional fuel loading as a result of insect-caused mortality in - steep, narrow valleys may burn – intensely during a wildfire. Overland water flow following severe wildfire may cause very rapid sediment release, depositing excessive sediment lower in the stream system.

The projects and actions proposed by the BLM in this environmental assessment would have undetectable influences on climate change. There is growing scientific evidence that climate change is a reality and human activities are contributing. The recent *National Climate Assessment* (Melillo et al. 2014) (nca2014.globalchange.gov), compiled by over 300 experts on climate change states; “The majority of the warming at the global scale over the past 50 years can only be explained by the effects of human influences, especially the emissions from burning fossil fuels (coal, oil, and natural gas) and from deforestation” (Gillett et al. 2012; Santer et al. 2013; Scott et al. 2010). “The conclusion that human influences are the primary driver of recent climate change is based on multiple lines of independent evidence. The first line of evidence is our fundamental understanding of how certain gases trap heat, how the climate system responds to increases in these gases, and how other human and natural factors influence climate. The second line of evidence is from reconstructions of past climates using evidence such as tree rings, ice cores, and corals. These show that global surface temperatures over the last several decades are clearly unusual, with the last decade (2000-2009) warmer than any time in at least the last 1300 years and perhaps much longer” (Mann et al. 2008). However, there is uncertainty about the local effects during the foreseeable future. While the long-term (100 year) trend clearly shows warming, local climatic records show great variability for any particular 15 year period. This would make any analysis of short-term impacts from climate change purely hypothetical. While it would be nearly impossible to accurately predict short-term climatic conditions, the land health standards remain relevant during either warm/dry or cool/wet periods.

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

Without grazing management changes and new range improvement projects cattle-induced riparian health concerns identified in the CW Assessment Report would not be addressed and

objectives for improving riparian health would not be accomplished. Static or downward trends would continue on stream reaches in four grazing allotments which could affect riparian health, fisheries habitat and/or water quality downstream from BLM administered lands. Conversely, on those allotments that were meeting rangeland health standards, resource conditions are expected to continue meeting or making progress toward management objectives.

The loss of whitebark pine habitat has landscape-level ecological consequences, including decline of biodiversity, alteration of successional pathways, changes in distribution of subalpine vegetation, and increased rates of snowmelt in high elevation areas (Tomback et al, 2001). This could also affect bear, rodent, Clark's nutcracker, and other bird species' as this food source declines.

The loss of sagebrush steppe habitat as a result of conifer expansion would continue under the no action alternative. This would result in continued departure of seral stages and increased fuel loadings associated with FRCC 2 &3 as identified in Predicted Effects for Alternative B&C above.

The expansion of conifers into the riparian habitat in the watershed would persist. Increasing Douglas-fir and Englemann spruce would continue to crowd out other riparian obligate woody and herbaceous plant species and communities. Loss of flora diversity in the riparian areas would have direct, detrimental impacts to critical fish and wildlife habitat. Reduced plant community diversity would decrease the abundance and variety of riparian dependent birds, mammals, insects and amphibians within specific drainages and throughout the entire watershed.

Current impacts and trends to fish habitat would continue under Alternative A. Fish habitat in an upward, downward or static trend would likely continue. In situations where habitat conditions are limiting populations, habitat requirements for fisheries would not be met and could result in long term declines.

The predicted effects of climate change would be the same as described in section 3.3.3.

4.3.4 Cumulative Effects All Action Alternatives

The proposed changes in livestock management would improve riparian health, water quality and upland health on BLM-administered land and other lands (private, state) within the proposed allotments. The timing and degree of change would vary based on specific resources issues and concerns and treatments implemented. The anticipated benefits to riparian habitat function would be improved sediment transport, better access to floodplains, dissipation of energy and, over time, improvements in channel morphology. Improved riparian function and health would improve water quality. The effects of implementing the selected alternative would be quantitatively determined by monitoring physical and vegetative indicators of riparian and upland function, and monitoring vegetative components of habitat.

Cumulative economic impacts could influence grazing lessees to subdivide private land to maintain economic viability. Sub-dividing of private land within the watershed is expected to continue or increase in the foreseeable future to some degree on private lands without conservation easements. Land use patterns on private and public lands in Beaverhead County

are slowly changing. As traditional agricultural lands are converted to residential and recreational properties fewer large scale ranching operations remain. Access to public land across private land is becoming more restricted and will likely continue as traditional ranches are subdivided into smaller parcels.

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

Commercial timber harvests provide economic benefits, including helping to pay for the management of diverse values. America's wood products and paper manufacturing sector employs approximately 900,000 workers, representing nearly 7% of manufacturing jobs in the United States (U.S. Census Bureau, 2011). Jobs in logging, trucking, road construction and forest and management services also benefit indirectly from commercial harvest. Employment related to forest products remains in urban areas of America, but it is especially important in rural communities where there are few other high-wage jobs (Society of American Foresters, 2012). It was estimated in 2002 that the direct forest industry employment in Washington and Oregon produced 13.2 workers per million board feet (MMBF) of annual timber harvest (Lippke & Mason, 2005). A similar study by Keegan et al. (2004) found that harvesting and processing saw timber generates nine direct full-time jobs per MMBF annually in Montana. Both studies indicated that some mill activity may depend on imported materials from other states and may not be directly linked to local harvests.

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

Implementing the proposed non-commercial/prescribed fire treatments in conjunction with past and reasonably foreseeable future actions, would increase the structural and seral heterogeneity within the watershed and result in more discontinuous fuel loading within the sagebrush steppe habitat. As future disturbances (e.g., wildfire, insects) occur, the effects would be more varied across the landscape. Future wildfires would still occur but would be expected to be smaller and less severe as a result of the heterogeneous fuel loading.

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

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

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

Inevitably recreational use in the CW will continue to increase. The threat of new aquatic invasive species entering the area, specifically Lima Reservoir, will be high. Education of fishermen, boater and other recreationists remains the primary way to reduce the risk. A cooperative effort between federal state and local authorities will be required to prevent the establishment of new species.

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

Cumulative efforts to improve the quality of occupied WCT and fluvial arctic grayling habitat and expand their habitat in the Centennial Valley will help decrease the threat of localized extirpations as well as improve the species resiliency to long term events outside of our control, such as climate change.

A large portion of occupied WCT habitat within the watershed occurs on federally managed lands located upstream of private property. Improvement of riparian resource conditions on public land administered by the BLM within this watershed would have a positive impact on WCT habitat and populations.

The action alternatives identified in this EA are expected to make incremental progress towards mitigating related resource issues in the Middle Rocky Ecoregion.

As previously discussed above in Section 4.2.3.1, it is difficult, if not impossible to identify specific impacts of climate change on specific resources within the analysis area. As

summarized in the Climate Change SIR (2014), climate change impacts can be predicted with much more certainty over global or continental scales. Existing models have difficulty predicting temperature changes at small scales. On smaller scales, natural climate variability is relatively larger, making it harder to distinguish changes expected due to external forces (such as changes from local activities to GHGs). Uncertainties in local forces and feedbacks also make it difficult to estimate the contribution of GHG changes to observed small-scale temperature changes (IPCC 2007b, as cited by the Climate Change SIR 2014). Effects of climate change on resources are described in Chapter 3 of this EA (section 3.3.3) and in the Climate Change SIR (2010).

The BLM expects only minor changes in the form of increased carbon sequestration capability of vegetation and soil with regard to climate change from actions implemented by the BLM within the Centennial Watershed. In fact, given current technology, any change would likely be undetectable. Regarding impacts from climate change, there is a great deal of uncertainty over what to expect during the life of the Watershed Plan (10 years). While the long-term (100 year) trend clearly shows warming, local climatic records show great variability for any particular 15 year period. This would make any analysis of short-term impacts from climate change purely hypothetical.

The implementation of the selected alternative would improve the ability of affected public land within the CW to perform their physical and biological functions including carbon sequestration. As discussed above under 4.2.3.1, healthy forests, riparian/wetland areas, and rangelands mitigate GHGs in the atmosphere by storing carbon in the soil and vegetation. Proper livestock management on rangelands increases carbon sequestration in these areas and decreases the number of livestock produced in feedlots that contribute to GHGs (at least for a portion of their life cycle).

The alternatives in this EA reduce the number of livestock overall on public land within the Centennial Watershed along with other actions expected to improve riparian/wetland, upland and forest health conditions. Therefore, the limited emissions associated with livestock digestion and excretion would decrease from current levels and carbon sequestration in the soil and vegetation would increase as land health conditions improve. The proposed alternatives and projects are not expected to cause negative impacts to climate change. Conversely, a reduction in net GHGs in the atmosphere is expected, as land health conditions improve.

The application of the land health standards requires that they are met regardless of climatic conditions. While it would be nearly impossible to accurately predict short-term climatic conditions, the land health standards remain relevant during warm/dry or cool/wet periods. Progress towards meeting Land Health Standards is expected regardless of fluctuations in climate over the life of this plan. The Dillon Field Office's Watershed Assessment and planning process facilitates adaptive management over ten year increments. By reviewing land health across the watershed(s) and adjusting management to account for documented land health issues, impacts or effects from climate change (as well as other causes/uses) will be accounted for and alternatives developed to mitigate impacts and continue to maintain, or progress towards, site specific objectives and Land Health Standards.

Please refer to Chapter 3, section 3.3.1 for a more thorough discussion of climate change and its effects on resources.

4.3.5 Cumulative Effects of Alternative B

Generally, additional impacts or predicted effects other than those described in section 4.2.4 and 4.2.5 are not expected on a landscape level. Because many allotments within the CW are intermingled with state and private lands, improvements to resource conditions resulting from management changes and projects would produce benefit across all ownerships. Impacts resulting from grazing, vegetative projects and/or recreation on private and State lands, which are not subject to BLM Standards, would continue. This could impact wildlife migration and dispersal depending on timber harvests planned on State and private lands in the future. Any reductions in AUMs on BLM lands would increase grazing use on private or state land within the watershed if herd numbers stay the same.

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

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

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

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

4.3.6 Cumulative Effects of Alternative C

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

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

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

The economic impacts to individual ranchers and on a cumulative basis are expected to be relatively greater under Alternative C than under the other alternatives. Alternative C generally

has more added rest, decreased duration of use and fewer livestock numbers than either Alternative A or B.

Chapter 5

5.0 List of Preparers - Consultation/Coordination

5.1 List of Preparers

Core IDT members:

Pat Fosse, Assistant Field Manager for Renewable Resources.

Paul Hutchinson, Fisheries Biologist.

Steve Armiger, Hydrologist/Riparian Coordinator (Soil/Water/Air).

Kelly Bockting, Wildlife Biologist.

Kipper Blotkamp, Forester.

Rick Waldrup, Outdoor Recreation Planner/Wilderness Specialist.

Joe Sampson, Fuels Specialist.

Ryan Martin, Rangeland Management Specialist, IDT Leader.

Support IDT members:

Laurie Blinn, GIS Specialist.

Jason Strahl, Archaeologist .

Michael Mooney, Weeds Specialist.

Kelly Savage, TES plants.

Bob Gunderson, Mining.

Dave Williams, Geology.

Other Support Personnel.

Leea Anderson, Range Technician.

Berett Erb, Range Technician.

Kate Alder, Administrative Assistant.

Ellen Daugherty, Administrative Assistant.

Mike Philbin, Riparian Program Lead MT/Dakotas.

Kerry Wahl, Wildlife Biologist, Montana Department of Fish, Wildlife and Parks.

Tim Egan, DNRC, Dillon Field Office.

Ron Slader, Dubois Ranger District.

Avery Beyer, Dubois Ranger District.

5.2 Consultation/Coordination

5.2.1 Notifications.

Assessment Initiation Notice; Centennial Watershed mailing list – May, 2014.

Media Release; Assessment Initiation Notice – May, 2014.

Internet NEPA Log – Dillon Field Office – January, 2014.

Media Release; Centennial Watershed Assessment Report Completion and EA Initiation Notice – January, 2015 .

Montana/Dakotas External Website - Assessment Report – January, 2015 .

5.2.2 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. IDT members coordinated/consulted with many members of the public, conservation groups and local, state and federal agencies during alternative development.

5.3 Glossary of Terms

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

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.

Anthropogenic: relating to, or influenced by the impact of man on nature.

Application for Beneficial Water Use Permit: Montana DNRC Application for Beneficial Use Permit, Form 600, is used for surface water appropriations and groundwater developments in excess of 35 GPM or 10 AC-FT per year ten acre.

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.

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.

Climax plant community: the final or stable biotic community in a successional series; it is self-perpetuating and in equilibrium with the physical habitat.

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

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

Desired Future Condition: Stream channels display the dimensions, pattern and profile that are representative of site potential (Rosgen) Dillon RMP 2006.

Ecological processes: include the water cycle (the capture, storage, and redistribution of precipitation), energy flow (conversion of sunlight to plant and animal matter), and nutrient cycle (the cycle of nutrients such as nitrogen and phosphorus through the physical and biotic components of the environment). Ecological processes functioning within a normal range of variation will support specific plant and animal communities.

Ecotone: 1. the transition zone between two adjoining communities, 2. an edge habitat.

Evapotranspiration: the conversion of water, whether surface water, soil moisture (both by evaporation), or within plants (by transpiration) into water vapor that is released to the atmosphere.

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.

Gall: a pronounced swelling or abnormal growth, usually localized, of greatly modified tissue structure arising on plants in response to irritation by a foreign organism, commonly an insect or pathogen.

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 woody component; non-woody vegetation such as graminoids and forbs.

Herbivore: a plant eating animal.

Herbivory: the act of feeding on plants by an herbivore.

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

Hummocking: a form of micro-topographic relief characterized by raised pedicels of vegetated soil as much as 0.6 m (2ft) higher than the surrounding ground which results from long term large animal trampling and tracking in soft soil. Vegetation on the pedicels usually differs from that on the surrounding lower area due to moisture difference between the two levels. Hummocking is also caused by abnormal hydrologic heaving.

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.

Krummholz: the shrubby, multistemmed form assumed by trees and other woody vegetation near the treeline.

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

Lek: Traditional arenas where male prairie grouse, e.g. sage grouse, gather during early spring to conduct a courtship display, attract females, and breed. For sage grouse, the lekking arena often is referred to as a “strutting ground”.

Mesic: characterized by, relating to, or requiring a moderate amount of moisture.

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

Notice of Completion of Groundwater Development: Montana DNRC Notice of Completion of Groundwater Development, Form 602, is used for completed groundwater developments where the water has been put to use with a maximum use of 35 GPM not to exceed 10 AC-FT per year.

Objective: planned results to be achieved within a stated time period. Objectives are subordinate to goals, are narrower in scope and shorter in range, and have increased possibility

of attainment. The time periods for completion, and the outputs or achievements that are measurable and quantifiable, are specified. (See goal).

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

Phloem: a layer of cells just inside the bark of plants that conducts food from the leaves to the stem and roots.

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

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

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

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

Rosgen Classification System: A classification system for natural rivers in which a morphological arrangement of stream characteristics is organized into relatively homogeneous stream types. Morphologically similar stream reaches are divided into 7 major stream type categories that differ in entrenchment, gradient, width/depth ratio, and sinuosity in various landforms. Within each major category are six additional types delineated by dominant channel materials from bedrock to silt/clay along a continuum of gradient ranges.

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

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

Seral: of, relating to, or constituting an ecological sere.

Sere: a series of ecological communities that succeed one another in the biotic development of an area or formation.

Shear stress: the force exerted by flowing water on the bed or banks of a stream. Shear stress may be estimated as the product of mean flow depth or hydraulic radius, channel slope, and the density of water.

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.

Statement of Claim: a sworn statement for an existing water right, as defined in § 85-2-224, MCA, filed with the department upon order of the Montana supreme court.

Sublimination: the transition of a substance (such as water) from the solid phase (ice) directly to the vapor phase, or *vice versa*, without passing through an intermediate liquid phase.

Succession: the orderly process of plant 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.

Total Maximum Daily Loads: A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that load among the various sources of that pollutant.

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.

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

5.4 References Used or Cited

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Appendix A – Centennial Watershed Maps - 1-12

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Appendix B - Centennial Watershed Monitoring Plan

Monitoring Plan for Centennial Watershed

Introduction

The purpose of this resource monitoring plan is to measure the effectiveness of management changes, structural projects and vegetative treatments in meeting the goals and objectives developed for the Centennial Watershed (CW). This plan has been designed to measure progress towards site specific objectives developed by an ID team where resource concerns were identified during the Centennial Watershed Assessment. This plan will identify when, where and how studies will be conducted, as well as the types of data that will be collected, how the data will be evaluated, and who will participate in the process. All monitoring methodologies are approved BLM monitoring methodologies and are described in various BLM or Interagency Handbooks. This information, including technical references, BLM policy and procedure handbooks, and monitoring guidelines and methodology descriptions are available for review at the Dillon Field Office. Technical references and BLM procedural handbooks are also available on the BLM library website; <http://web.nc.blm.gov/blmlibrary>.

All *existing* monitoring studies that are needed to measure progress towards objectives or Standards will continue to be read on the same time schedule as any identified new studies.

Site Specific Objectives

Four Key Issues and eight additional Resource Concerns were identified during the Centennial Watershed Assessment and through public scoping and were analyzed in the Centennial Watershed Environmental Assessment (EA). Site specific objectives have been developed based on each key issue and resource concern. The amount of change desired for each of the objectives will be determined once additional baseline data is gathered during the 2015 field season. The goal is to make measurable progress towards site specific objectives to be able to meet all Rangeland Health Standards and site specific objective by 2024.

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

Objectives:

- Improve streambank stability and width/depth ratio of streams within the natural range of variability based on Rosgen Stream Types.
- Mitigate excessive head cutting and restore vertical channel stability.
- Restore deciduous woody and herbaceous riparian habitat types, with emphasis on reducing conifer and non-native species composition.
- Increase deep-rooted riparian vegetation (sedges, willows) where decreased composition was documented.
- Reduce sediment inputs into streams where human activities such as authorized grazing, recreational impacts and roads are contributing to unacceptably high sediment loads.
- Maintain/enhance habitat for cold water fisheries in occupied streams.
- Restore, maintain and/or enhance native vegetation and hydrology of springs, seeps and wet meadows with emphasis on ecological function and biodiversity.
- Protect the water source of developed springs from impacts (hoof action) by livestock.

Monitoring activities to measure progress towards meeting Riparian, Wetland and Aquatic Habitat objectives:

- **Continue monitoring existing riparian studies to measure progress towards objectives.**
- Springs that are developed/redeveloped will be photographed before and after development and inspected and photographed periodically after development (every 2-3 years), including prior to the next scheduled assessment.
- Spring developments will be checked at least annually during compliance inspections to verify that maintenance is being completed as agreed to in Cooperative Agreements.
- Dysfunctional spring developments that are removed/cleaned up will be photographed before and after project clean-up.

Table 1: Additional Site Specific Riparian and Wetland and Aquatic Habitat Monitoring

Allotment Name and #	Stream and Stream Reach	Objective	Monitoring Methodology
Antelope Peak	Antelope Peak wetland #1750	Increase sedge composition Decrease pugging/hummocking	Greenline transect and/or Photo point
Coconouger	Red Rock River #362 & adjacent wetland	Maintain condition of stream and wetland	Photo point(s)
Fish Creek	Metzel Creek #1315 Fish Creek #312	Increase sedge Reduce streambank impacts Increase sedge Reduce streambank impacts	Greenline transect Cumulative width-depth transects and photo points
Lima Reservoir AMP	Wolverine Creek #364	Reduce streambank impacts Increase sedge along the greenline	Cumulative width-depth transect Greenline transect Photo point(s)

Allotment Name and #	Stream and Stream Reach	Objective	Monitoring Methodology
Long Creek	Middle Creek #339 Mohican trib #340 West Creek #378 Wolverine Creek #1600	Reduce streambank impacts and sediment input; Increase deep-rooted riparian vegetation Increase sedge along the greenline Reduce streambank impacts and sediment input Increase willow regeneration Reduce streambank impacts Increase deep-rooted riparian vegetation	MIM or Cumulative width-depth transect Greenline transect MIM Greenline transect and photopoints
Morton Individual	Corral Creek trib #1608	Increase deep rooted riparian vegetation and decrease streambank impacts	Greenline transect and/or Photo points
Peet Creek	East Fork Peet Creek #1653 Bean Creek #1651	Decrease streambank impacts and reduce sediment input/ Decrease streambank impacts and reduce sediment input.	MIM or Cumulative width-depth transect MIM or Cumulative width-depth transect
Red Rock	Red Rock River #380	Decrease streambank impacts	Photo-points
Shambo	Bean Creek #1651 Jones Creek #317	Decrease streambank impacts and reduce sediment input	Cumulative width-depth transect

Allotment Name and #	Stream and Stream Reach	Objective	Monitoring Methodology
Shambo	Bean Creek #300, 301 & 302	Monitor results of riparian conifer treatment. Increase deciduous woody vegetation and sedge along the greenline.	MIM or Greenline transect and photopoints.

Key Issue #2: Upland and Sagebrush Steppe Habitat

Objectives:

- Restore the soil/site stability, hydrological function, and biotic integrity of upland sites in allotments where one or more of these attributes of rangeland health was determined to be reduced.
- Increase cover and frequency of native perennial cool season herbaceous species where concerns were documented, which will improve the hydrological function and site productivity.
- Restore/maintain open sagebrush communities in habitats incurring conifer expansion.

Monitoring activities to measure progress towards meeting upland habitat and associated species objectives:

- Continue monitoring existing upland studies to measure progress towards objectives.
- Non-commercial mechanical/prescribed fire treatments:
 - Gather fuels and vegetation transect data on up to five representative sites. Photographic documentation should include pre and post-treatment photos from a designated point to verify ocular estimates. If prescribed burns are conducted after May 15, complete migratory bird surveys prior to burning activities.
 - Directly after prescribed fire treatments, retake photographs at established points and/or retake measurements along each pre-treatment transect to determine if treatment objectives have been attained.
 - One to four years after treatment: Re-measure transects and photo points to show vegetative response to the treatment and progress towards meeting objectives. Changes in use by big game, specifically elk, within a sample of the treatment areas will be measured by conducting pellet group transects prior to treatment and then, at least annually, for up to five years following treatment.

Table 2: Site Specific Upland and Sagebrush Steppe Habitat Monitoring

Allotment Name	Objective	Monitoring Methodologies
All allotments	Maintain or increase composition and cover of cool season perennial bunchgrasses	Daubenmire or Quadrat Frequency transects and/or Photo points (most of this monitoring is already in place, but will be continued)
Red Rock Rody Morton Individual Lima Reservoir Mud Lake	Increase composition and cover of cool season perennial bunchgrasses	Daubenmire or Quadrat Frequency transects and/or photo points
Price Creek Peet Creek Shambo Unit Duff Creek allotments	Reduce 60% or more of conifers less than 30 feet tall that have recently expanded into previously open sagebrush-dominated communities	See bullet points above Table 2 and in addition Line Point Intercept transect to measure sagebrush canopy cover pre and post treatment.

Key Issue #3: Forest and Woodland Habitat

Objectives:

- Maintain/enhance existing aspen and promote successful regeneration of aspen.
- Increase diversity of seral stages and structures in forested habitats.
- Reduce hazard rating for spruce budworm and Douglas-fir bark beetle activity.
- Mitigate mortality of whitebark and limber pine from insects and disease in priority areas and priority individual trees (PLUS trees), and promote successful regeneration of whitebark and limber pine.
- Utilize forest products where feasible.
- Return fire to the landscape as a natural disturbance agent for the purpose of resiliency and diversity of seral classes (age, structure), through the use of prescribed fire.

Monitoring activities to measure progress towards meeting forest and woodland habitat objectives:

Pre- Implementation:

- Commercial Harvest Units:
 - Complete Forest Vegetation Information System (FORVIS) walkthrough survey to classify the existing vegetation type within a representative sample of each stand type. Walkthrough survey data includes canopy species

composition and density, understory vegetation, fuel loading, and density and size class of snags and down wood.

- Establish GPS photo points within a representative sample of stand types, and document general stand conditions with photos. Documentation will reflect the particular objectives of individual units.
- Establish GPS photo point(s) showing approximate percent cover of habitat type species and any occurrence of insect/disease at the landscape-scale.
- Whitebark and Limber Pine Treatments:
 - For trees suspected of being blister rust resistant, GPS and tag tree. Measure DBH, height, and crown ratio.
- Complete Forest Vegetation Information System (FORVIS) walkthrough survey to classify the existing vegetation type within a representative sample of each stand type. Walkthrough survey data includes canopy species composition and density, understory vegetation, fuel loading, and density and size class of snags and down wood.
- Establish GPS photo points within a representative sample of stand types, and document general stand conditions with photos. Documentation will reflect the particular objectives of individual units.
- Establish GPS photo point(s) showing approximate percent cover of habitat type species and any occurrence of insect/disease at the landscape-scale.

Post Implementation:

- Commercial Harvest Units:
 - Within two years after implementation on a given unit, re-visit each stand to obtain the same data measurements described above and evaluate if the stand objectives were reached.
 - Monitor post-harvest stands for new insect and disease activity.
 - Ungulate browse monitoring of aspen regeneration may be implemented if excessive browsing appears to be restricting new aspen suckers from growing taller than browse height.
 - Whitebark and Limber Pine Treatments.
 - Complete re-application of pheromones or insecticide. Inspect trees for evidence of mountain pine beetle attack and/or blister rust.
 - Complete stocking surveys in areas planted with whitebark pine.
 - Within two years after implementation on a given unit, re-visit each stand to obtain the same data measurements described above and evaluate if the stand objectives were reached.
 - Monitor post-harvest stands for new insect and disease activity.

Monitoring of prescribed fire treatments to reduce slash post-harvest, and following whitebark pine day-lighting treatments are the same as described for prescribed fire monitoring activities listed under Key Issue #2: Upland Health and Sagebrush Steppe Habitat.

Key Issue #4: Special Status Species Habitat

Objectives:

- Enhance/improve/protect “Priority Habitats” including aspen, whitebark pine and limber pine.
- Improve streambank stability, vegetative cover and width/depth ratio on westslope cutthroat trout (WCT) streams.
- Continue to work with MT Fish, Wildlife and Parks and other partners in the management of native fish (WCT and arctic grayling).
- Maintain >70% mountain big sagebrush habitat in canopy closure of 5 to 25 percent.
- Maintain an adequate herbaceous understory in sagebrush steppe habitat emphasizing multiple species of native forbs and grasses.
- Maintain or enhance habitat for sensitive plant species and provide ample opportunity for reproduction and seedling establishment. Increase/Improve early seral habitat in the Centennial Sandhills.
- Mitigate mortality of whitebark and limber pine from insects and disease in priority areas and priority individual trees (PLUS trees) and promote successful regeneration of whitebark and limber pine.
- Continue monitoring rare plant populations in the Sand Dunes in coordination with TNC. May add additional transects in treatment areas to monitor effectiveness of mechanical disturbance.

Monitoring Activities to measure progress towards meeting Fish, Wildlife and Special Status Species Habitat objectives:

Table 3: Site Specific Monitoring for Sagebrush Obligate Species Habitat

Allotment Name	Objective	Monitoring Methodologies
All Priority and General Sage Grouse Habitat Antelope Peak Allotment	-Maintain 15 – 25% sagebrush cover in nesting/early brood rearing habitat. Maintain or increase composition of forbs. -Maintain an average of 6-7 inch residual understory within site potential on the majority of the area. Increase forb and sagebrush composition in within the area of Antelope Peak that was treated for sagebrush (unauthorized in 2011).	-Habitat Assessment Framework (HAF) - Line Point Intercept plots to measure canopy cover of sagebrush, and herbaceous and forb understory. -Forage utilization and herbaceous understory cover will be measured annually within time constraints of staff. HAF

Related objectives and monitoring activities to measure progress towards fish, wildlife and special status species habitat are included above under Key Issues for Riparian, Wetland, and Aquatic Health, Upland Health and Sagebrush Steppe Habitat, and Forest and Woodland Habitat.

Additional monitoring activities specific to fish, wildlife and special status species habitat include:

- Document and establish baseline inventory for any new “unmapped” populations of sensitive plants that are found.
- The inventory should include the number of individual plants, a description of the habitat (e.g., associated species, soils, aspect and elevation) and an assessment of any existing and potential threats to the population.
- Coordinate with MTFWP and USFS biologists to continue delineating seasonal habitat for sage grouse.
- Coordinate with MTFWP and Montana Audubon to continue annual sage grouse lek monitoring (counts).
- Continue coordination efforts with TNC and USFWS on sage grouse research.
- Coordinate with MTFWP and USFS biologists to continue monitoring population trends of WCT in within the Centennial Watershed.
- Assist MTFWP with arctic grayling surveys within the Centennial Watershed.
- Maintain a 6” herbaceous stubble height along greenline and/or three inches on the floodplain by reach, whichever occurs first to provide a sediment buffer on all WCT stream.
- Continue habitat monitoring on WCT Habitat every 5-10 years to include temperature data and habitat surveys using the DEQ protocol for monitoring with the exception of Bean Creek.
- Continue stream temperature monitoring on a two-year alternating basis on Bean Creek to track potential changes due to the riparian conifer treatment.
- Continue WCT population monitoring on a five-year basis in Bean Creek to track potential changes resulting from the riparian conifer treatment.
- Initiate riparian willow/sedge restoration on Bean Creek within the riparian treatment area.
- Inventory harvest units for northern goshawk and great gray owl to identify any nesting territories and determine nesting activity.
- Continue to monitor trumpeter swam oxbow excavations to determine occupancy and continue monitoring territories to document nest success.
- Set up photo points and possibly greenline or woody browse regeneration transects to monitor vegetative changes as a result of the conifer treatments along Price, Peet and Bear Creeks.

Resource Concern #1: Noxious and Invasive Species

Objectives:

- Reduce the composition of noxious and invasive vegetative species within the watershed.
- Mitigate the spread of noxious and invasive plants into, within, or from the watershed.

Monitoring activities to measure progress towards meeting noxious and invasive species objectives are included in above under Riparian, Wetland, and Aquatic Habitat and Upland and Sagebrush Steppe Habitat.

Any seeding projects (e.g. Red Rock allotment) will be monitored using a photo point and a quadrat frequency or Daubenmire transect or macroplot.

Resource Concern #2: Socioeconomics

Objectives:

- Continue to contribute to the local economy by providing an opportunity for sustainable uses on public land through livestock grazing, utilization of forest products, and recreational activities.
- Recover economic value of dead/dying timber before it is lost due to decay, where feasible.

Trends in socioeconomics will not be monitored by the local BLM office.

Resource Concern #3: Wildland Urban Interface

Objectives:

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

Monitoring Activities to measure progress towards meeting Wildland Urban Interface objectives are:

- Designate photo points to record fuel conditions pre and post treatment. Plots may be established to estimate the stem count of conifers before and after treatments if the information is necessary to quantify treatment effectiveness.

Resource Concern #4: Cultural and Paleontological Resources

Objectives:

- Preserve and protect significant cultural and paleontological resources and ensure that they are available for appropriate uses by present and future generations.
- Reduce imminent threats from natural or human-caused deterioration, or potential conflict with other resource uses.

- Ensure that all authorizations for land and resource use avoid inadvertent damage to federal and nonfederal cultural resources in compliance with Section 106 of the National Historic Preservation Act and the Paleontological Resources Preservation Act.

Monitoring activities to measure progress towards meeting cultural and paleontological resource objectives include:

Cultural Resources: Visit a minimum of 10 previously recorded cultural resource properties that are listed on the National Register of Historic Places or determined eligible for listing, on an annual basis, to update the site form to current professional standards and to assess the current condition and trend of significant resource values.

Paleontological Resources: Of the five major geographic paleontological areas in the field office, visit one of the geographic areas on an annual basis to identify if any adverse impacts are occurring.

Resource Concern #5: Recreation and Travel Management

Objectives:

- Effectively implement the Dillon RMP Travel Management Plan.
- Revise motorized route designations as necessary to correct mapping errors and improve route designations.
- Reduce unauthorized (non-designated route travel) motor vehicle use on closed routes within the Centennial Mountains WSA.
- Maintain motorized wheeled vehicle access to those areas where it already exists, and improve access to public land where appropriate and where opportunities are currently limited.
- Reduce resource impacts caused by recreationists, including spread of noxious weeds.

The goals for both Travel Management and OHV Use and Transportation in the Approved Dillon Resource Management Plan for Recreation collectively say; “to manage roads and trails and manage motorized travel to provide for public access or administrative needs, while maintaining or protecting resource values in conjunction with other federal agencies, state and local governments, and private landowners.”

Monitoring will consist of compliance checks to determine if closed roads show signs of use, as well as the enforcement of the travel management plan, specifically during the big game hunting season.

Resource Concern #6: Visual Resources

Objectives:

- Limit management activities or projects within the Centennial Mountain WSA to avoid “attracting attention” in accordance with VRM Class I and Class II objectives

- Manage the rest of the CW so as not to detract from the existing landscape and other objectives stipulated under VRM Class III guidelines.

Monitoring activities to measure progress towards meeting visual resource objectives include: Reviewing proposed activities for consistency, and encouraging field staff to look around when they are in the area and report unauthorized activities that may be impacting visual resources.

Resource Concern #7: Wilderness Characteristics**Objectives:**

- Maintain wilderness characteristics of the Centennial Mountains Wilderness Study Areas.
- Manage the WSAs to the non-impairment standard as outlined in BLM Manual 6330 - Management of Wilderness Study Areas, until congress either releases them or designates them as wilderness.
- Maintain, on a continuing basis, an inventory of wilderness characteristics as describe in BLM Instruction Memorandum No. 2011-154.

Planned monitoring will consist of compliance checks and continuation of existing monitoring. WSA monitoring forms will be completed, and photographic documentation will be used where applicable.

Resource Concern #8: Air Quality**Objectives:**

- Minimize impacts to Air Quality by coordinating with the Montana/Idaho Airshed Group and utilizing Burn Plans.

Actions will consist of coordination with the Montana/Idaho Airshed Group and following their guidance while preparing and implementing our Burn Plans.

Types of Data Collected

The established permanent vegetative and physical trend transects in the Centennial Watershed were read and data was updated during 2013. The date when these studies were initially established and read is considered baseline data. However, in order to adequately measure progress towards site specific objectives, additional studies will be established in key areas during 2015 or 2016 and baseline data will be gathered on the newly established studies. Baseline data is considered the starting point from which to measure progress towards meeting objectives or effectiveness of management changes implemented beginning in 2016 (on the new studies only). Data from existing studies will be compared and evaluated from the time they were established and data was initially collected.

Key areas are defined as relatively small areas that reflect or have the capability to reflect the effectiveness of management of the resources of a larger area. Depending on management objectives, a key area may be a representative sample of a large stratum, pasture, allotment, or a particular management area. Key areas or monitoring sites should represent the high variability

of riparian, upland and forest habitat types, patterns of use, and conditions of forest, rangeland or riparian health. Over the next several years the following data will be collected (See Table 4).

- Actual livestock and wildlife use. Actual use is the grazing use of an area by all classes of forage consumers. This information is necessary to provide a correlation between utilization and trend data. Considered alone, actual use data are essentially meaningless. However, when considered in conjunction with climate and utilization data, this data is necessary to interpret trend data accurately.
- Annual compliance, including utilization of upland forage, browse levels on willows and aspen, measurement of sedge stubble heights and/or measurement of stream bank alteration. This monitoring will occur primarily at established key areas, but may occur in other areas as well. Annual compliance monitoring will be done on a prioritized basis with I category allotments being the highest priority, followed by M, and then C category allotments. In areas where competition for resources may occur between livestock and big game, pre-livestock data may also be collected. This annual data will be used to help determine pasture moves, accurately interpret trend data, and serve as an early indicator on whether implemented changes are effective. If annual monitoring reveals resource degradation or ineffective management changes (as determined by BLM specialists), trend studies may be read at any time prior to the next scheduled assessment (2024), and adjustments in management analyzed in the interim.
- Local precipitation and temperature. This data is necessary to interpret trend data accurately.
- Long term trend. Trend data will be used to measure progress towards meeting objectives as described above.

Trend refers to the direction of change and indicates whether the forest, rangeland, riparian area or other resource is being maintained or is moving toward or away from the desired plant community or other specific management objectives. Trend studies are important in the long term for determining the effectiveness of management actions in meeting or moving towards management objectives.

Trend data will be collected again in 2023 or 2024, unless specified otherwise for specific objectives. The Centennial Watershed will be re-assessed or evaluated during 2024. In this process, all monitoring data will be summarized, analyzed, interpreted, and evaluated to measure progress toward meeting objectives. Trend data gathered in 2023 will be compared to baseline (established in 2015 or 2016) and existing trend data gathered or updated in 2013. The measured change in the data will be used to measure progress toward meeting objectives, thereby evaluating management and making informed decisions regarding subsequent management (continuation or change). This is called adaptive management. For example, if monitoring data shows that progress is being made toward established objectives, current management will be continued or modified slightly as warranted, according to the data. However, if data shows a downward trend (change away from objectives) or does not show any progress toward meeting objectives by 2022, and it is determined that current livestock management is a significant factor

in precluding progress toward meeting objectives, then management will be adjusted by implementing an alternate system, changing the season of use and/or reducing authorized AUMs. The level of adjustment will be determined by the degree of divergence from the objectives.

Monitoring methodology descriptions are available for review at the Dillon Field Office. Technical references and BLM procedural handbooks are also available on the BLM library website: <http://web.nc.blm.gov/blmlibrary>.

Table 4: Planned Resource Monitoring Activities

Type	Method	Responsibility	Frequency
Actual Use	Actual Use Reports submitted by grazing lessees Wildlife observations Wildlife population monitoring in cooperation with the MFWP Recreation user days	Range, Wildlife and Recreation Staff	Annually
Compliance/ Utilization	Utilization – Grazed/Ungrazed Method or Key Forage Plant Method	Range, Wildlife or Fisheries Biologists, Hydrologist Outdoor Rec Planner.	Annually on a prioritized basis
	Stubble height – Stubble Height Method		
	Bank alteration – Stream bank Alteration Methodology as defined by Idaho State Office BLM, 2000		
	Browse use – Extensive Browse Method		

Type	Method	Responsibility	Frequency
Climate	Precipitation data available from National Oceanic and Atmospheric Administration and other sources	Available from external sources	Annually
Habitat Characterization	Inventory for leks and seasonal habitats Sagebrush canopy and herbaceous understory measurements along established transects in sage grouse (Habitat Assessment Framework), elk calving and mule deer winter habitats	Wildlife Staff, MFWP, NWF	Annually on a prioritized basis
Population(s)	Sage Grouse – male lek attendance WCT – periodic population sampling through electro-fishing Pygmy rabbit surveys Trumpeter Swan nests	MFWP and BLM Biologists will coordinate and assist, where applicable	Annually for sage grouse; 5 year intervals for WCT

Type	Method	Responsibility	Frequency
Trend (also see Table 3)	<p>Biotic Quadrat Frequency Daubenmire Line Point Intercept Cover Board Woody Species Regeneration Greenline Multiple Indicator Monitoring (MIM) Macroplots/Belt Transects Photopoints Fire Regime Condition Class (FRCC) LANDFIRE (as applicable)</p> <p>Physical Cumulative width/depth ratio</p>	Range, Wildlife or Fisheries Biologists, Hydrologists, Foresters, Fuels Specialists	Any new trend monitoring studies will be established during 2015. Trend data (new and existing studies) will be gathered again in 2023 or 2024.
Watershed Evaluation	Analysis, Interpretation, Evaluation and Recommendations	ID team	FY2024

Budget Requirements

This monitoring plan was prepared with the assumption that funding will remain at or near existing levels for the foreseeable future. In this light, it is anticipated that the bulk of the monitoring workload will have to be borne by the existing range, wildlife, fisheries, forestry, fuels, hydrology, recreation, wilderness and cultural resource specialists along with a minimum of six seasonal employees each field season for the duration of this plan.

Litigation workload associated with Watershed Assessments also directly effects how much monitoring the existing staff is able to complete.

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Appendix C - Centennial Watershed Biological Evaluation for Special Status Plants

**Biological Evaluation for
Special Status Plants on BLM Lands in the Centennial Watershed
(Centennial Watershed Environmental Assessment)
DOI-BLM-MT-B050-2015-0011-EA**

Prepared by
Kelly Savage, Rangeland Management Specialist/TES Plants
May 2015

None of the plants currently listed as endangered or threatened under the Endangered Species Act inhabit BLM lands in the Dillon Field Office. However, Ute ladies' tresses, which is listed as threatened in Montana, is known to occur on private and state lands in Beaverhead, Madison, Gallatin, and Jefferson counties. Twelve sensitive plant species inhabit BLM-administered lands within the Dillon Field Office. Seven of those species are known to occur within the Cumulative Impact Area of the Centennial Watershed (CW) Environmental Assessment. One of the seven sensitive plant species is whitebark pine which is discussed in section 3.2.3. The potential effects that the various alternatives may have on these species are summarized in the following table. A detailed discussion of predicted effects and potential impacts to special status plant species and their habitat is provided in the attached "Supplemental Information on Special Status Plants on BLM Lands in the Centennial Watershed."

Definitions of Abbreviations used in the Table.

NI - No Impact

BI - Beneficial impact to populations or habitat

MIH - May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

* **WIFV** - Will impact individuals or habitat with a consequence that the action may contribute to a trend toward federal listing or cause a loss of viability to the population or species.

* Consultation with the U.S. Fish and Wildlife Service will be initiated if an alternative is selected that may contribute to a loss of viability to a population of species reviewed in this evaluation.

Biological Evaluation Summary for Special Status Plants for the Centennial Watershed Environmental Assessment (DOI-BLM-MT-B050-2014-0011-EA)

Common Name <i>Genus species</i>	Does the species occur on Public Lands within the Centennial Watershed?	Is the species or its habitat found in the Cumulative Impact Area?	Are irreversible or irretrievable resources involved?	What effect could this proposal have? *		
				Alt. A	Alt. B	Alt. C
Ute ladies' tresses <i>Spiranthes diluvialis</i>	NO	NO	--	--	--	--
Cusick's horse-mint <i>Agastache cusickii</i>	NO	NO	--	--	--	--
Sapphire rockcress <i>Arabis fecunda</i>	NO	NO	--	--	--	--
Painted milkvetch <i>Astragalus ceramicus</i> <i>var. apus</i>	YES	YES	NO	MIH	BI	BI
Bitterroot milkvetch <i>Astragalus scaphoides</i>	NO	NO	--	--	--	--
Railhead milkvetch <i>Astragalus terminalis</i>	YES	YES	NO	NI	NI	NI
Idaho sedge <i>Carex idahoa</i>	YES	YES	NO	NI	NI	NI
Fendler cat's-eye <i>Cryptantha fendleri</i>	YES	YES	NO	MIH	BI	BI
Beautiful bladderpod <i>Lesquerella pulchella</i>	YES	YES	NO	NI	NI	NI
Sand wildrye <i>Leymus flavescens</i>	YES	YES	NO	MIH	BI	BI
Alkali primrose <i>Primula alcalina</i>	NO	NO	--	--	--	--
Silver chicken sage <i>Sphaeromeria argentea</i>	NO	NO	--	--	--	--

* The livestock management and project proposals are not consistent across alternatives. For example, the season of use for one allotment under Alternative B may not be the same as the season of use for another allotment under the same alternative. For the purposes of this biological evaluation if a proposed grazing treatment (numbers, duration, time of year, frequency of rest), project or vegetative treatment within a given alternative is likely to adversely affect a sensitive plant or its habitat, then that effect is reflected in the table.

Supplemental Information on Special Status Plants on BLM Lands in the Centennial Watershed

The Dillon Resource Management Plan provides guidance that requires project sites in high probability habitats to be surveyed for sensitive plants prior to any ground disturbing activities. This reduces the possibility that sensitive plant species would be accidentally or inadvertently impacted by BLM activities.

No impacts from any of the three alternatives considered in the EA are anticipated for railhead milkvetch, Idaho sedge, or beautiful bladderpod. Railhead milkvetch inhabits grasslands and sagebrush steppe habitats. It is vulnerable to intensive grazing and weed invasion. However, the only known population of this species in the Centennial valley exists in an unallotted section of

BLM administered land. Beautiful bladderpod inhabits harsher sites in the Centennial Mountains. It is found growing in sparsely vegetated sites in the montane and the subalpine zones. Idaho sedge inhabits riparian areas scattered throughout the Centennial valley on both private and BLM administered land. None of the three species just mentioned are likely to be impacted by any of the alternatives. Both railhead milkvetch and beautiful bladderpod occupy current habitat that is not frequented by cattle. The riparian areas inhabited by Idaho sedge are currently meeting the riparian health standard. There are no proposed management changes in these areas. All three species are located in areas that would not be affected by proposed projects such as range improvement projects or vegetation treatments.

Painted milkvetch, Fendler cat's-eye, and sand wildrye are found only in the sand dunes of the Centennial valley in Montana. These three species require early seral habitat to thrive. If no action is taken to promote this early seral habitat, late seral vegetation would begin to colonize areas of formerly open sand which would decrease the populations of these rare plants in this very specialized habitat. Both alternatives B and C have the potential to benefit these species by destabilizing blowout areas in the dunes which would increase and improve early seral habitat required for these rare plants.

During the summer of 2010, the U.S. Fish and Wildlife Service announced a 90-day finding on a petition to list whitebark pine (*Pinus albicaulis*) as endangered or threatened and to designate critical habitat. In July of 2011, the finding was released; whitebark was given a warranted but precluded listing with a priority of 2 and is currently on the candidate species list (For a complete description of whitebark pine in the CW see Forest and Woodland Health section 3.2.3).

Cumulative Considerations:

High probability habitats will be surveyed for sensitive plants prior to any ground disturbing activities on federal land but botanical surveys aren't required on private and state lands even on cooperative projects (e.g. a pipeline that crosses multiple ownerships). It's possible that sensitive plant species could be accidentally or inadvertently impacted by construction or placement of range improvement projects on non-federal lands.

The invasion of introduced species and noxious weeds near and into special plant species habitat across all ownerships poses a direct threat to these plants through competition, habitat degradation and the potential impact of herbicides. The use of insecticides on private lands within the CW to control grasshoppers or other insects may affect pollinators that visit sensitive plant species on BLM lands.

/s/ Kelly Savage
Signature

May 7, 2015
Date

Printed Name and Title: Kelly Savage, Rangeland Management Specialist/TES Plants

References:

Heidel, B.L. 1998. Conservation status of *Spiranthes diluvialis* Sheviak in Montana. Unpublished report to U.S. Fish and Wildlife Service. Montana Natural Heritage Program, Helena. 55 pp. + app.

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Lesica, P. 2003. Conserving Globally Rare Plants on Lands Administered by the Dillon Office of the Bureau of Land Management. Report to the Bureau of Land Management, Dillon Office. Montana Natural Heritage Program, Helena, MT.

Montana Natural Heritage Program (MNHP). 2015. Montana Rare Plant Field Guide. (Available online at <http://mtnhp.org/SpeciesOfConcern/Default.aspx>)

United States Department of the Interior, Bureau of Land Management, Dillon Field Office. 2014. Montana BLM Sensitive Plant Species Found on or Near BLM Lands Administered by the Dillon Field Office. List prepared for the Dillon Field Office based on Instruction Memorandum No. MT-2014-067

**Appendix D - Centennial Watershed Biological Evaluation
for Special Status Fish and Wildlife Species**

BLM DILLON FIELD OFFICE
Biological Evaluation for Special Status Fish and Wildlife Species.
 Form Revised August 2014 - Updated September 2014

Project: Centennial Watershed EA # DOI-BLM-MT-B050-2015-0011-EA

Step 1a.	Step 1b.	Step 1c.	Step 2	Step 3.	Step 4.	Step 5.	Step 5.	Step 5.
List of all Special Status Species that are known or suspected to occur on the DFO.	Current Management Status of the Species.	Does the species occur on this portion of the Field Office?	Is the species or its habitat found in the surrounding area?	Could this proposal have any effect?	Are Irreversible or Irretrievable Resources involved?	Alt A level of effect	Alt B level of effect	Alt C level of effect
Canada Lynx (<i>Lynx canadensis</i>)	Threatened	N	Y	N				
Grizzly Bear (<i>Ursus arctos horribilus</i>)	Threatened	Y	Y	Y	N	MIIH	NLAA	NLAA
Greater Sage Grouse (<i>Centrocercus urophasianus</i>)	Canidate	Y	Y	Y	N	MIIH	BI	BI
Mammals								
Fringed Myotis (<i>Myotis thysanodes</i>)	Sensitive	N	Y	N				
Gray Wolf (<i>Canis lupus</i>)	Sensitive	Y	Y	Y	N	MIIH	MIIH	MIIH
Great Basin Pocket Mouse (<i>Perognathus parvus</i>)	Sensitive	Y	Y	N				
North American Wolverine (<i>Gulo gulo luscus</i>)	Sensitive	Y	Y	N				
Pygmy Rabbit (<i>Brachylagus idahoensis</i>)	Sensitive	Y	Y	Y	N	MIIH	MIIH	MIIH
Spotted Bat (<i>Euderma maculatum</i>)	Sensitive	N	N	N				
Townsend's Big-eared Bat (<i>Plecotus townsendii</i>)	Sensitive	Y	Y	N				

Step 1a. List of all Special Status Species that are known or suspected to occur on the DFO.	Step 1b. Current Management Status of the Species.	Step 1c. Does the species occur on this portion of the Field Office?	Step 2 Is the species or its habitat found in the surrounding area?	Step 3. Could this proposal have any effect?	Step 4. Are Irreversible or Irretrievable Resources involved?	Step 5. Alt A level of effect	Step 5. Alt B level of effect	Step 5. Alt C level of effect
Birds								
American Bittern (<i>Botaurus lentiginosus</i>)	Sensitive	Y	Y	N				
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Sensitive	Y	Y	N				
Black Tern (<i>Chlidonias niger</i>)	Sensitive	Y	Y	N				
Black-backed Woodpecker (<i>Picoides arcticus</i>)	Sensitive	Y	Y	Y	N	NI	MIIH	MIIH
Brewer's Sparrow (<i>Spizella breweri</i>)	Sensitive	Y	Y	Y	N	MIIH	MIIH	MIIH
Burrowing Owl (<i>Athene cunicularia</i>)	Sensitive	Y	Y	N				
Caspian Tern (<i>Hydroprogne caspia</i>)	Sensitive	Y	Y	N				
Chestnut-collared Longspur (<i>Calcarius ornatus</i>)	Sensitive	N	N	N				
Common Tern (<i>Sterna hirundo</i>)	Sensitive	N	Y	N				
Ferruginous Hawk (<i>Buteo regalis</i>)	Sensitive	Y	Y	N				
Flammulated Owl (<i>Otus flammeolus</i>)	Sensitive	Y	Y	Y	N	NI	BI	BI
Forster's Tern (<i>Sterna forsteri</i>)	Sensitive	Y	Y	N				
Franklin's Gull (<i>Larus pipixcan</i>)	Sensitive	Y	Y	N				
Golden Eagle (<i>Aquila chrysaetos</i>)	Sensitive	Y	Y	N				
Great Gray Owl (<i>Strix nebulosa</i>)	Sensitive	Y	Y	Y	N	NI	MIIH	MIIH

Step 1a. List of all Special Status Species that are known or suspected to occur on the DFO.	Step 1b. Current Management Status of the Species.	Step 1c. Does the species occur on this portion of the Field Office?	Step 2 Is the species or its habitat found in the surrounding area?	Step 3. Could this proposal have any effect?	Step 4. Are Irreversible or Irretrievable Resources involved?	Step 5. Alt A level of effect	Step 5. Alt B level of effect	Step 5. Alt C level of effect
Lewis's Woodpecker (<i>Melanerpes lewis</i>)	Sensitive	Y	Y	Y	N	NI	BI	BI
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	Sensitive	Y	Y	Y	N	NI	BI	BI
Long-billed Curlew (<i>Numenius americanus</i>)	Sensitive	Y	Y	N				
McCown's Longspur (<i>Calcarius mccownii</i>)	Sensitive	Y	Y	N				
Mountain Plover (<i>Charadrius montanus</i>)	Sensitive	N	N	N				
Peregrine Falcon (<i>Falco peregrinus anatum</i>)	Sensitive	Y	Y	Y	N	NI	MIH	MIH
Sagebrush Sparrow (<i>Artemisiospiza nevadensis</i>)	Sensitive	Y	Y	N				
Sage Thrasher (<i>Oreoscoptes montanus</i>)	Sensitive	Y	Y	N				
Sprague's Pipit (<i>Anthus spragueii</i>)	Sensitive	N	N	N				
Trumpeter Swan (<i>Cygnus buccinator</i>)	Sensitive	Y	Y	N				
Veery (<i>Catharus fuscescens</i>)	Sensitive	Y	Y	Y	N	NI	BI	BI
White-faced Ibis (<i>Plegadis chihi</i>)	Sensitive	Y	Y	N				
Yellow Billed Cuckoo (<i>Coccyzus americanus</i>)	Sensitive	N	N	N				
Amphibian/reptiles								
Boreal/Western Toad (<i>Bufo boreas</i>)	Sensitive	Y	Y	Y	N	MIH	MIH	MIH
Northern Leopard Frog (<i>Rana pipiens</i>)	Sensitive	N	N	N				

Step 1a.	Step 1b.	Step 1c.	Step 2	Step 3.	Step 4.	Step 5.	Step 5.	Step 5.
List of all Special Status Species that are known or suspected to occur on the DFO.	Current Management Status of the Species.	Does the species occur on this portion of the Field Office?	Is the species or its habitat found in the surrounding area?	Could this proposal have any effect?	Are Irreversible or Irretrievable Resources involved?	Alt A level of effect	Alt B level of effect	Alt C level of effect
Fish								
Westslope Cutthroat Trout (<i>Onchorhynchus clarkii lewisi</i>)	Sensitive	Y	Y	Y	N	MIIH	BI	BI
Arctic Grayling (<i>Thymallus arcticus montanus</i>)	Sensitive	Y	Y	Y	N	MIIH	BI	BI
Invertebrates								
Western Pearlshell (<i>Margaritifera falcatea</i>)	Sensitive	N	N	N				

Step 6. Are there any specific recommendations to avoid significant effects (if any)? These are mitigation measures needed to avoid determinations of: LAA, LJ, WIFV. If so, the narrative describing these recommendations would be discussed in the NEPA document.

Step 7. Documentation: This short form is intended to follow a seven-step process to provide basic biological evaluations. Judgments must not be arbitrary but should be reasoned. This form provides a “road map” of that reasoning and assumes the judgments are drawn from numerous sources. Any species-specific impacts should be discussed in the NEPA document or below under the Narrative of Potential Impacts.

The signature below certifies that:

1. The wildlife biologist has reviewed the proposed action and its alternatives, but may or may not have provided input to alternative design, depending on the issues.
2. The wildlife biologist has an understanding of the specific conditions found in the affected area. Column 1a lists all possible Special Status Species in the Dillon Field Office. Column 1b identifies the species’ current management status. Column 1c indicates whether there are no records (N/A), or whether the species is considered a Transient (T) or Resident (R) {for our purposes, resident includes migratory species that fulfill a portion of their life history here}. Step 2 is satisfied by field visits or knowledge of local conditions from previous visits resulting in enough information to determine if the area is potential habitat for species listed in Step 1. Extensive surveys are not necessary if the conservative approach is taken that: “suitable habitat” means the potential for occupancy.
3. The wildlife biologist has an understanding of the species habitat needs and other attributes important to the determination. This can be a combination of literature review, professional experience, and consultation with others.
4. The wildlife biologist has assimilated the above information in making the “determinations” (i.e. final judgments about the scientific significance of the effects).

Signed: /s/ Kelly Bockting Date: 6-9-15 Signed: /s/ Paul Hutchinson Date: 6-9-15

Printed Name and Title: Kelly Bockting, Wildlife Biologist Paul Hutchinson, Fisheries Biologist

N/A – “Not Applicable.” Indicates this species does not occur in the project area or that the project would have no bearing on its potential habitat. These species were removed from detailed analysis after field review of existing and potential habitats and consideration of distribution records.

FEDERALLY LISTED SPECIES

NE - No Effect.

***LAA** - May Effect - Likely to Adversely Affect (formal consultation required) .

NLAA - May Effect, Not Likely to Adversely Affect (informal consultation - concurrence with determination - required).

BE - Beneficial Effect (informal consultation - concurrence with determination - required).

SPECIES PROPOSED FOR LISTING

NE - No Effect.

NLJ - Not likely to Jeopardize the continued existence of the species or result in the destruction or adverse modification of proposed critical habitat.

***LJ** - Likely to Jeopardize the continued existence of the species or result in the destruction or adverse modification of proposed critical habitat.

SENSITIVE SPECIES

NI - No Impact.

MIH - May Impact Individuals or Habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

***WIFV** - Will Impact Individuals or habitat with a consequence that the action may contribute to the need for federal listing or cause a loss of viability to the population or species.

BI - Beneficial Impact.

* triggers formal consultation process.

NARRATIVE of POTENTIAL IMPACTS

Canada Lynx - *Lynx canadensis*: The project area lies between the Northern Rocky Mountain and Southern Rocky Mountain core areas. The Centennial Mountains are identified as a linkage zone for Canada lynx between the Beaverhead Mountain Range and the Pioneer Mountains; however USFWS has not identified Beaverhead County as a county where lynx is reasonably expected to occur. No known occupied lynx habitat occurs in the watershed, although historic lynx observations have been made in the Centennials Mountains. Potential Canada lynx habitat is limited on BLM lands to the Centennial Mountains along the ID border on the south side of the valley. Lynx analysis units were identified in the CW in 2005 but are now obsolete since no lynx critical habitat has been designated in southwest Montana (USDI, 2014a). The Centennial Mountains have been designated as secondary habitat unable to sustain lynx populations but may enable successful dispersal (USDI, 2005.) Snowshoe hare are the primary prey for lynx and

winter snowshoe hare habitat is a limiting factor for lynx persistence. Snowshoe hare habitat consists of early succession, dense, young, regenerating forests or multistory forests that have trees whose limbs come down to snow level. In contrast, late succession mature stands are required for lynx denning habitat (Ulev. 2007).

No critical or occupied habitat has been identified on BLM lands or on the adjacent Beaverhead-Deerlodge (B-D) National Forest lands. The project area is considered unoccupied for lynx, but transient lynx may potentially move through the area. The USFWS concluded that areas naturally occupied by lynx populations at the time lynx were listed under the ESA are sufficient to conserve the population. Therefore, the critical habitat designation does not include areas not occupied by lynx at the time of listing. Much of the optimum habitat on the adjoining B-D has been surveyed multiple times using track surveys and hair snares between 1999 and 2014 and no lynx have been detected. Most recently, the B-D implemented a 3-year survey effort from 2012-2014 in the Anaconda Pintler Wilderness that is believed to be the most suitable lynx habitat on the forest. The DNA results from these surveys were negative for lynx and documented only black bears and bobcats. Also, remote trail cameras only detected non-target species (pers. com. Amie Shovlain 2015.) The nearest designated critical habitat is on the Gallatin National Forest directly adjacent to Yellowstone National Park.

In the Western U.S. lynx are associated with cool moist Engelmann Spruce, subalpine fir and lodgepole pine forest. Dry Douglas-fir and lodgepole pine forest, as found in the project area, do not provide lynx habitat. Discussions with Katrina Dixon and Anne Vandehey (FWS) in the previous years have conferred that the habitat on the B-D National Forest is too dry to support lynx long term. This area likely does not contain all physical and biological features in adequate quantities and spatial arrangements to support lynx populations over time [Interagency Lynx Biology Team (ILBT,) 2013]. The forest habitat within the project area is generally drier than the preferred moist boreal forests that include dense understories that provide foraging habitat and cover for the lynx's main prey; the snowshoe hare (ILBT, 2013). Vegetation management objectives to promote aspen and create a mosaic of forest structure including early seral coniferous stands are consistent with conservation measures outlined on page 96 of the Lynx Conservation Assessment Strategy (LCAS) for secondary areas. Regeneration following timber harvest, in conjunction with similar treatments on adjacent State and private lands, could provide cover and forage for potential snowshoe hare colonization.

The following rationale was used in determining that actions implemented under this EA will not affect Canada lynx.

- 1) The habitat in the project units is classified as unoccupied, secondary/peripheral habitat, and multiple survey efforts on the highest quality habitat on the B-D National Forest in the past 15 years have yielded negative results.
- 2) Management objectives are consistent with conservation measures for vegetation management in secondary/peripheral areas as outlined in the LCAS.
- 3) Proposed projects would not impede movement or reduce habitat connectivity for transient lynx across the landscape.
- 4) The habitat has minimal value other than for dispersing or transient lynx and limited regional distribution of lynx reduces the likelihood that potential habitat will be occupied.

Grizzly Bear - *Ursus arctos horribilus*: The CW lies in the Greater Yellowstone Ecosystem (GYE) outside of the Grizzly Bear Primary Conservation Area (PCA) formerly called the Yellowstone Recovery Zone. The CW borders the Beaverhead – Deerlodge National Forest to the north and Caribou – Targhee National Forest to the south. The CW and surrounding forests have been identified as suitable and /or occupied habitat for grizzly bear distribution outside the PCA. In the past five years the population estimate in the GYE has grown from 582 bears in 2009 to 757 bears in 2014 for grizzly bears was (USGS 2015). A Montana state management plan is being developed that would direct grizzly bear management if future delisting were to occur.

Grizzly bears are opportunistic and adaptable omnivores with a large vegetative component to their diet (fruit, grasses, bark, roots, mushrooms), while also feeding on carrion, fish, large and small mammals, insects, garbage and at times livestock. Yellowstone area grizzlies prefer open grasslands adjacent to cover for feeding activities. The Gravelly mountain range to the north has been occupied for years and documented observations have been on the rise in the CW for the last decade. Hibernation has not been documented in the Centennial Mountains but it is highly likely to occur, based on the increase in distribution and population growth in the GYE.

The CW is becoming increasingly popular to recreationists. As bear numbers increase, user conflicts are also expected to increase. To date, one incident has occurred 2014 when a bear hunter misidentified the species of a bear and was attacked. According to the 2014 IGBC report, even as populations have expanded outside the GYE, the long-term mortality trend since 1992 is 4-4.5 bears per year. However management removals due to livestock depredations during that same period have increased from 4% to 13% of the average annual mortalities (USGS 2015.) All 91 livestock conflicts reported in 2014 were south and east of Yellowstone National Park (YNP), none were reported in SWMT. An increase in depredations is to be expected as grizzly bear distribution expands outside of YNP and will continue to affect grizzly bear and livestock management in the future. Livestock grazing permits will be amended to make permittees aware that losses to livestock could occur from grizzly bears on all allotments in the CW. Formal Consultation was completed in 2006 for the Dillon RMP and a take permit was issued for potential mortalities due to livestock depredation. Changes in the distribution, quantity, and quality of cover are not necessarily detrimental to grizzly bears (ICST 2007), therefore the proposed fuels and forestry treatments are not expected to impede bear occupancy or prey base.

The Priority Linkage Assessment completed by American Wildlands in 2008 identified the CW as one of the highest linkage corridors in the High Divide. This includes habitat for all big game species as well as large carnivores such as black bears, gray wolves, grizzly bears, mountain lions and wolverines. The Middle Rockies Rapid Eco-regional Assessment (MR REA) used the American Wildlands Corridors of Life (ACLOL) model to depict grizzly bear habitat suitability for the CW. Based on habitat quality, the Centennial Mountains rate out as core and sub-core habitat with the valley rating out as secondary habitat acting as a corridor for connectivity between occupied habitats. This is depicted by shortest distance and high centrality to occupied habitat and has the highest landscape condition based on grizzly bear habitat requirements.

Efforts to minimize conflicts between people and bears represent a major component of any management program directed at the long-term conservation of the GYE grizzlies. In the past

decade public education and outreach has consisted of posting bear aware signs in the CW outlining recommendations for hiking, food storage, pet control and bear spray to avoid back country conflicts. The BLM also contributes funds to the Interagency Grizzly Bear Committee to support the BEAR AWARE programs in SW MT promoting how to properly manage potential food attractants and how to recreate safely in bear country.

The Centennial WSA is managed as a roadless area and provides the majority of the suitable grizzly bear habitat in the CW. Designated open road density within the CW on BLM-administered lands is currently 0.67 miles road/square mile which is below the 1 mile/square mile recommended by the Grizzly Bear Recovery Plan (GBRP). Under all alternatives in this EA, 6.8 miles of currently designated open roads would be un-designated. Under alternative B, 4.5 miles would be designated as open and under Alternative C, 5.8 miles would be designated as open. Both of these alternatives would lead to a net decrease in designated open road density within the CW on BLM lands. However, the 2.2 miles of existing route that could be re-designated as open in the east Corral creek area, (see Appendix A, map 4) is in currently occupied grizzly bear habitat and could lead to increased conflicts with recreationists in the future. The changes in open road density under all alternatives are virtually unmeasurable within the watershed and the open road density will be maintained well under the 1 mile/square mile within the CW.

Whitebark pine seeds are a primary food source for grizzly bears where this habitat exists. Grizzly bears are opportunistic omnivores and the loss of whitebark pine region wide has shifted their foraging base. Conservation efforts promoting regeneration of whitebark pine stands identified in this EA are expected to benefit grizzly bears in the CW.

All projects are consistent with the terms and conditions of the Biological Opinion that was issued for the Dillon RMP. Alternatives under this EA would alter habitat, but not to the extent that it would become unsuitable for dispersal or future occupancy. Therefore, is not likely to adversely affect grizzly bears.

Greater Sage Grouse - *Centrocercus urophasianus*: Important sage grouse seasonal habitat is centered on breeding and winter complexes. Brood rearing habitats require a mix of forbs and insects for a high protein diet usually in association with riparian habitats adjacent to sagebrush habitat. Winter diets consist of almost 100% sagebrush. Sage grouse populations and sagebrush habitats have declined in the Western United States on a regional basis due to significant habitat losses range-wide from: habitat agricultural conversion, urbanization, poor livestock grazing, and wildfire leading to annual grassland conversion. This emphasizes the importance of maintaining the integrity of all seral stages of sagebrush habitats on public lands. Refer to CW Assessment Report for a discussion on the diversity of existing sagebrush habitats in the CW.

Crucial time periods for sage grouse are the breeding, nesting and winter seasons. Sagebrush canopy cover (CC) habitat requirements for sage grouse during the breeding and nesting season are 15-25% and 10-30% for winter (Connelly et. al 2000). Habitat requirements for sage grouse also act a surrogate for other sagebrush obligate species, such as the pygmy rabbit and migratory birds that require sagebrush for nesting. Sagebrush cover amounts for both breeding/nesting and winter were found to be adequate throughout the CW during the field assessment. Sagebrush

vegetation monitoring data collected during 2014 averaged 36% CC of sagebrush and shrub height averaged 28 cm. Herbaceous CC averaged 55% and 11 cm in height. The CC and heights of shrubs and herbaceous vegetation is highly variable based on species composition and soil types.

Historically, there were large flocks of sage grouse that migrated and wintered in Idaho. Telemetry data from 2005-2006 have shown that some migration still occurs into Idaho as grouse migrate southwest across Interstate 15 to winter in Idaho or in the Snowline area in southwest Montana. This telemetry data has also documented sage grouse seasonally migrating north into the Basin Creek area. However, many sage grouse do stay and winter in the Centennial Valley. This migration may be dependent on annual snow pack conditions. Yearly counts of displaying males on leks in the CW have remained relatively stable in the past 10 years and in 2014 and 2015 the average male attendance per lek was the highest since 2007. Several potential new leks have been identified in the CW in the past few years and four of these leks were confirmed active in the spring of 2015. MT FWP also performed lek locating flights in 2015 to search for any unknown lek locations, but yielded negative results (Pers Com. Waltee. 2015.)

The CW contains 266,583 acres of Preliminary Priority Management Areas (PPMA) which was adopted from MT FWP (2009) sage grouse core areas as well as 27,682 acres of Preliminary General Management Areas (PGMA) for sage grouse which was adopted from *Distribution of Sage Grouse in North America* (Schroeder et.al. 2004.) Due to the large scale at which these maps were created it allowed for many acres of unsuitable sage grouse habitat to be included within the PPMA and PGMA. When analyzing a project, specific habitat within the project area will need to be identified/refined at the project level. The Schroeder distribution was mapped range wide at 1:2,000,000 and MT FWP core areas were mapped at 1:200,000. MT FWP (2009) core area designations relied on a focus area typically within 10km of a lek complex, recognizing that unsuitable habitat is included within these boundaries. One such criterion that is met in the CW for unsuitable habitat is “Areas where 20% or more of the surrounding 1,000 acres are forested.” There are 2,460 acres identified for prescribed fire treatments in the CW that meet these criteria as unsuitable within PPMA (Refer to map 12.) Of these, 670 acres are designed to maintain open Douglas-fir savannah habitat (units PC1A - PC3B, Map 2.) another 1,790 acres is unsuitable and is identified to promote aspen regeneration. These projects would not have any impact on sage grouse in the CW.

The only prescribed burn unit in sagebrush habitat that is identified for conifer removal to promote long term sagebrush maintenance is the Corral West unit (Refer to Appendix A, Maps 2 and 12). This unit totals 262 acres which represents less than 1% of the sagebrush-steppe habitat on BLM lands in the CW. Although this unit is bordered by timber, it is late seral mountain big sagebrush habitat. Burning this area would increase diversity by promoting forb production, removing the existing colonizing Douglas-fir trees and restore the unit to an early seral stage sagebrush grassland habitat. There are no known noxious weeds in any of the identified units, so the risk of invasion is low to non-existent. This project would have short term localized impacts due to the loss of sagebrush with the goal of maintaining the sagebrush steppe habitat long term. Sage grouse have been documented in treatment areas within the DFO foraging for forbs and insects following the implementation of similar projects. Davies (2011) recognized the need to re-introducing fire into these higher elevation mountain big sagebrush habitats early on by

stating “Priority should be placed on restoring infrequent fires to sagebrush plant communities that are in the early phases of woodland development.” “A longer-term view of restoration is needed, where short-term loss of sagebrush dominance to reduce early conifer encroachment is acceptable and practiced where it will not result in a devastating decline in habitat for sagebrush-associated wildlife.” (Davies et.al.2011).

Proposed seeding of forbs on 50 acres within the Antelope Peak allotment would benefit early brood rearing for sage grouse. This would be within the unauthorized aerial spraying where the forb component was reduced. Alternatives that are designed to improve riparian habitat would also improve sage grouse brood rearing, and existing management that is providing adequate seasonal habitat and sagebrush overstory is expected to continue.

Two peregrine falcon hack towers are located in PPMA that overlook sage grouse leks and brooding habitat. These would be removed under the action alternatives (refer to Peregrine falcons below.) Removal of the hack towers would be consistent with current greater sage grouse management to remove tall structures that assist predators in becoming more effective. This would potentially reduce predation on sage grouse, especially young broods. None of the alternatives identified in this EA are expected to impact sage grouse that would lead to Federal listing.

American Bittern - *Botaurus lentiginosus*: American bitterns favor large freshwater wetlands with tall emergent vegetation such as cattails and bulrushes. They prefer beaver-created wetlands to those of glacial origin. Occasionally, sparsely vegetated wetlands are occupied and tidal marshes rarely. Managed wetlands, such as those at wildlife Lakes NWRs, are often used. In the CW the Red Rock Lakes NWR provides the best habitat. A typical nest is a platform of dried rushes, sedges, and cattails placed in dense emergent vegetation over shallow water. Bitterns forage along shorelines, in dense marsh vegetation, and in wet meadows. American Bitterns are almost always solitary and can be difficult to see, often hiding among wetland vegetation, walking slowly as they forage. They migrate to winter ranges in the southern U.S. and Central America where temperatures stay above freezing and waters remain open. American Bitterns eat mainly insects, amphibians, crayfish, small fish and small mammals, occasionally garter snakes. Little is known about population trends and general biology throughout their range, but protection of large wetlands (> 10 ha) with emergent vegetation is the most urgent management need. Depending on the precipitation from year to year, habitat can be found throughout the valley. The alternatives in this EA would not affect the existing habitat for the American bittern.

Bald Eagle - *Haliaeetus leucocephalus*: The USFWS delisted the bald eagle in August 2007 but the species is still protected under the Bald and Golden Eagle Protection Act of 1940. The Montana Bald Eagle Management Plan (MBEWG 1994) directs management of this species in Montana. Specific objectives identified in the plan include: a minimum of 99 breeding territories in Montana; nesting success rate of 65% over a 5-year period with annual average production of 1.0 fledged. Population trends in Montana have steadily increased from 31 breeding pairs in 1980 to over 550 in 2010 with a nest success averaging 76% and an average brood size of 1.8 during that period (MBEWG 2010.) Breeding pairs now occupy a high percentage of suitable habitat across the state with five known active territories in the CW. General objectives of habitat management for Bald Eagles in Montana include: maintaining prey

bases; maintaining forest stands currently used or suitable for nesting, roosting, and foraging; planning for future potential nesting, roosting, and foraging habitat; and minimizing disturbances from human activities in nest territories. Operations associated with the timber harvest in Corral Creek would not be allowed during the nesting season if the nest is occupied. This would alleviate any disturbance that could potentially cause the bald eagles to abandon an active nest. None of the alternatives in this EA are expected to impact habitat or prey species to the extent that it would lead to Federal listing.

Black Tern - *Chlidonias niger*: Black tern breeding habitat is mostly wetlands, marshes, prairie potholes, and small ponds; however, several locations are on man-made islands or islands in man-made reservoirs. The core of the breeding range is the prairie pothole area of the northern Great Plains. Across all Montana sites where black terns are present, approximately 30%-50% of the wetland complex is emergent vegetation. Vegetation within known breeding colonies includes alkali bulrushes, canary reed-grass, cattail spp., sedge spp., rush spp., grass spp., indicating a wide variety of potential habitats are usable by black terns. Migrating black terns have been observed just north of Dillon as early as April with the majority of spring migration observations in May and June. Primary diet consists mainly of insects and small freshwater fish.

The main causes of population declines in North America appear to be habitat loss and degradation on the breeding grounds, although introduced species, human disturbance, and contaminants may be contributing factors. However little is known about threats to the black tern during migration and winter. The largest black tern colony in Montana was formerly at Red Rock Lakes NWR, which prior to the mid 1980's hosted 1000+ Black Terns. A dramatic decline in numbers followed the installation of a new dam structure in the late 1980's (Shuford 1999.) although black terns are still known to nest on the Red Rock Lakes NWR (pers. com. Cutting). None of the alternatives in this EA would impact habitat or individuals as to lead to Federal listing.

Black-backed Woodpecker - *Picoides arcticus*: The habitat of black-backed woodpeckers in Montana is early successional, burned forest of mixed conifer, lodgepole pine, Douglas-fir, and spruce-fir. Black-backed woodpeckers are a resident species in Montana and have been observed during almost every month of the year. Black-backed woodpeckers are highly responsive to forest fire and other processes, such as spruce budworm outbreaks, resulting in high concentrations of wood-boring insects invading dead trees. Local and regional irruptions and range extensions have been observed in response to burns and wood-borer outbreaks. The Tipton-Winslow fire in 2003 along with the beetle and spruce budworm outbreak in SW Montana over the past 10 years has supported a higher concentration of black-backed woodpeckers in the past decade, than in previous decades. The bulk of the diet of black-backed woodpeckers is wood-boring beetle larvae but they also feed on other insects and will occasionally eat fruits, nuts, sap, and cambium. Timber harvest activities that remove bug killed trees may reduce some foraging opportunities where wood boring beetle larvae still exist. Prescribed fire treatments under both action alternatives that are targeted to kill colonizing Douglas-fir would increase foraging opportunities. Under alternative B less than 1% of the forested habitat in the watershed would be harvested and under alternative C less than 2% would be harvested. Neither of these alternatives, nor the no action, is expected to impact the black-backed woodpecker and lead to Federal listing.

Brewer's Sparrow - *Spizella breweri*: The Brewer's Sparrow typically breeds in shrubsteppe habitats dominated by sagebrush. In sagebrush areas in central Montana, Brewer's sparrows nested in sagebrush averaging 16 inches high with nests 6-8" above the ground. Foraging occurs primarily in shrubs consisting of insects during the breeding season, young are fed almost exclusively arthropods (Rotenberry et al. 1999).. Brewer's sparrows are migratory and arrive on breeding grounds by late April with nesting occurring by late May. Nestlings have been observed as early as early June and fledglings by early July.

Breeding bird surveys and monitoring by the Rocky Mountain Bird Observatory in the past 25 years have documented this species throughout the CW. Throughout its range, this species faces threats from loss of sagebrush habitats as a result of habitat conversion for agriculture and increased frequency of fire as a result of weed encroachment and drought. Conservation efforts for greater sage grouse may also assist in the conservation and management of other sagebrush-dependent species, including the Brewer's sparrow. Under the alternatives, prescribed fire may remove some nesting and foraging habitat for the short term. All prescribed fire treatments would occur prior to nesting season. The overall goal of using prescribed fire is to remove colonizing conifers from sagebrush habitats, therefore maintaining the shrubsteppe habitat long-term. Under the no action alternative conifers would continue to colonize sagebrush steppe habitat and habitat would be lost long-term. The alternatives in this EA are not expected to impact the Brewer's sparrow and lead to Federal listing.

Burrowing Owl - *Athene cunicularia*: Burrowing owls are found in open grasslands characterized by sparse vegetation and bare ground where abandoned burrows dug by mammals such as ground squirrels, prairie dogs and badgers are available. They are not known to excavate their own burrows, but existing burrows may be enlarged or modified making them more suitable. There are no prairie dog colonies in the CW, but badger, ground squirrel and pygmy rabbit burrows are prevalent. Although they provide burrows, badgers are a major predator of burrowing owls. Burrowing owls in the CW are thought to be migrants, as breeding has not been documented and habitat is limited as open grassland makes up only 8% of the overall watershed. Burrowing owls in the northern part of its range migrate to Mexico and Central America. They are opportunistic feeders with a varied diet dependent upon the time of year with invertebrates comprising the majority of their diet in most areas, but small mammals, amphibians, reptiles, and birds may also be consumed. The alternatives in this EA are not expected to have any effect on burrowing mammals that provide nesting habitat for burrowing owls and grassland habitat is not expected to change. None of the alternatives in this EA would impact burrowing owls or lead to Federal listing.

Caspian Tern - *Hydroprogne caspia*: Caspian Terns are migratory in Montana and begin arriving in late April to mid-May. Fall migration starts in late August and continues through the end of September. Transient sightings occur throughout the state during spring migration, especially between April and June. Most of its continental population is concentrated at a couple of key estuaries, several very large inland lakes, and scattered islands along the Gulf Coast. All records in the CW are on the Red Rock Lakes NWR and thought to be transients as nesting has not been documented.

The Caspian Tern prefers islands within large lakes or reservoirs, where sandy or stony beaches are used for nesting. The species has also been noted to utilize rivers during migration, though

nesting in this habitat is not documented. Caspian terns are less tolerant of vegetation succession than other gulls, and vegetation succession has rendered many sites unsuitable for breeding terns (Shuford and Craig, 2002.) There are multiple accounts from around North America of individual colonies being rapidly destroyed or severely impacted by mammalian predators, especially foxes, coyotes, raccoons, feral cats, and mink. Individual eagles, falcons, or owls can also pose serious threats to a Caspian tern colony (Shuford and Craig, 2002.) None of the alternatives in this EA would impact the Caspian tern or lead to federal listing.

Ferruginous Hawk - *Buteo regalis*: Ferruginous hawks breeding in Montana are entirely migratory. Fall migration begins in August and continues into early September. Young birds will migrate south earlier than, and independent of, adults. Restani (1991) reported most returns to the Centennial Valley occurring in April and May and sagebrush-grassland complexes on mid-elevation slopes are where most hawks nested in southwest Montana. Atkinson (1992, 1993) described the preferred habitat in southwestern Montana as sagebrush steppe over foothill prairie or mountain mahogany. These complexes included sagebrush species and rabbitbrush as overstory to wheatgrasses, needle-and-thread grass, and junegrass. Distribution appears clumped, with large areas of apparently suitable habitat unoccupied (Atkinson 1992.) BLM monitoring of many the territories identified in 1992-93 document that they have remained occupied. Primary prey sources include white-tailed jack rabbits, ground squirrels and western meadowlarks. Other prey sources include passerines, grasshoppers, and voles. Some studies in other areas of the species' range focused on vulnerability of prey. It is an important factor in habitat suitability because ferruginous hawks avoid dense vegetation that reduces their ability to see prey. None of the alternatives are expected to reduce prey availability or alter habitat as such that it would impact the ferruginous hawks and lead to Federal listing.

Flammulated Owl - *Psiloscops flammeolus*: In the northern part of their range flammulated owls are a Neotropical migrant arriving in late April-early May and departing by October. Flammulated owls are obligate cavity nesters and prefer mature open canopy ponderosa pine and Douglas-fir forests but have also been documented using cavities in pure aspen stands. No food habit data exists for flammulated owls in Montana, however information gathered from other areas of the species' range indicate flammulated owls mainly hunt at night foraging on nocturnal arthropod prey along the interface between forest or woodland and grassland. Most studies have shown that flammulated owls have a preference of ponderosa pine and although they have not been documented in the CW, they have been documented using Douglas-fir in other watersheds in the DFO. Under the action alternatives there would be plenty of snag retention post-harvest and the increase in shrubby browse species by opening up the forest canopy would be beneficial to foraging. The alternatives in this EA are not expected to have any impacts to this species that would lead to Federal listing.

Fluvial Arctic Grayling - *Thymallus arcticus montanus*

Arctic grayling are found in several water bodies within the CW. The largest segment of the population is found in Upper Red Rock Lake and Red Rock Creek. Smaller segments of this population utilize Lower Red Rock Lake and the lower portions of O'Dell Creek, Long Creek, West Creek and Lima Reservoir. Declines in this population are attributed to habitat alteration, reduced stream flows, loss of access to spawning streams, siltation, and predation or competition from non-native fish species.

Grayling occupation of BLM lands within the CW is very limited. Lima Reservoir and West Creek are the only two documented areas with grayling occupation. As such alternatives in this EA are unlikely to directly impact grayling habitat. Grayling are found in several streams downstream of BLM managed land within the CW. Improvements to riparian areas through management changes proposed in Alternative B and C to allotments within the Long Creek and West Creek drainages could lead to improvements in downstream habitat and would result in beneficial impacts to grayling habitat. None of the alternatives in this EA are expected to have any impacts to grayling that would lead to Federal listing. On the contrary, alternatives in this EA are expected to be beneficial to arctic grayling.

Forster's Tern - *Sterna forsteri*: In general, this species is described as a short- to medium-distance migrant. It is present throughout the year in all but the most northerly portions of its breeding range. In Montana normal arrival and departure migration dates for the Forster's tern are generally mid-May through the third week in September. This species has been documented breeding on the Red Rock Lakes NWR in the CW. The preferred breeding habitat for the Forster's tern are large marshes with extensive reed beds or muskrat houses that provide nesting structures, it is also occasionally found along marshy borders of lakes and reservoirs in Montana. The species generally nests colonially, with as many as five nests recorded on one muskrat house. Primary prey consists of insects caught in the air or snatched off the surface of the water while the bird is in flight and also dives into water for fish. Large bodies of water with emergent vegetation and nest structures, such as muskrat houses, are central to maintaining habitat for this species. None of the alternatives in this EA are expected to reduce available habitat that would lead to Federal listing of this species.

Franklin's Gull - *Leucophaeus pipixcan*: The Franklin's Gull is migratory in Montana. It generally returns to the state in mid-April and is gone by early to mid-October. Preferred habitat is relatively permanent prairie marsh complexes, building nests over water on a supporting structure of emergent vegetation, usually cattails and bulrushes. A key factor in nest site selection is that the floating nest must be on water deep enough so that the marsh area does not dry completely before the young can fledge (Casey, 2000.) They are primarily insectivorous, consuming aquatic invertebrates (especially midges and midge larva) but are also known to follow agricultural equipment and consume what is disturbed, including earth worms, grasshoppers, and small mammals. Maintaining water levels in marshes to keep from flooding nests and provide protection from mammalian predators during nesting is crucial. None of the alternatives in this EA would alter available habitat that would lead to Federal listing of this species.

Fringed Myotis - *Myotis thysanodes* and Townsend's Big-eared Bat - *Plecotus townsendii*: Habitat for both of these species consist of caves and abandoned mines that are used for maternity roosts and hibernacula, use of buildings in late summer has also been reported. Habitats in the vicinity of roosts include Douglas-fir and lodgepole pine forests, ponderosa pine woodlands, Utah juniper-sagebrush scrub, and cottonwood bottomland. Townsend's Big-eared Bat feeds on various nocturnal flying insects near the foliage of trees and shrubs and appears to specialize primarily on small moths although other insects in the diet include lacewings, beetles, true flies, and wasps. Fringed myotis also feed on beetles and moths as well as some spiders. Fringed myotis and have been found with many other bat species including Townsend's Big-

eared bat. Neither of these species has been reported to occur in the CW but habitat does exist. None of the alternatives are expected to impact either of these species.

Golden Eagle - *Aquila chrysaetos*: Golden eagles are protected under the Bald and Golden Eagle Protection Act of 1940. Some golden eagles remain in Montana year-round, but vertical migration from mountains to valleys occurs in the winter. They generally nest on cliffs when available, or in large trees associated with sagebrush/grassland. This open shrub/grassland is used for hunting jackrabbits, ground squirrels, and carrion. They occasionally prey on deer and Pronghorn (mostly fawns), waterfowl, grouse, weasels, skunks, and other animals. Breeding Bird Survey (BBS) data for Montana show non-significant annual increases of 1.0% per year during 1966-2009 and 1.7% per year for 1999-2009. Documented territories in the DFO have been known to be active for decades. Golden eagles are regularly observed in the CW with one known nesting territory occurring. None of the alternatives in this EA are expected to impact nesting habitat or prey abundance to any degree that would lead to Federal listing.

Gray Wolf - *Canis lupus*: Gray wolves are now a BLM sensitive species and are identified as a “species in need of management” under jurisdiction of MT FWP. MT FWP is the lead agency for managing gray wolves, including population monitoring, resolving wolf-livestock conflicts, research, and public outreach. Federal regulations continue to guide Montana FWP management practices.

This species is not migratory but may move seasonally following migrating ungulates within its territory. Gray wolves also disperse widely and exhibit no particular habitat preference except for the presence of native ungulates within its territory on a year-round basis. They are opportunistic carnivores that predominantly prey on large ungulates. Primary prey species in the CW include deer, elk and moose. Alternative prey sources include rodents, vegetation and carrion as well as domestic livestock such as cattle and sheep. Gray wolves commonly hunt in packs, but lone animals and pairs are able to kill prey as large as adult moose. They are territorial throughout the year and packs generally consist of a socially dominant pair, their offspring of the previous year, and new pups, although other breeding-age adults that may or may not be related to the alpha pair may also be present. Gray wolves establishing new packs in Montana have demonstrated greater tolerance of human presence and disturbance than previously thought characteristic of this species.

Gray wolf populations continue to increase throughout Montana. According to MTFWP 2013 Annual Wolf Report (Bradley et.al. 2014), the estimated minimum number of wolves in MT in 2013 was 627 with a minimum of 152 verified packs. In southwest MT, including the GYE, there is an estimated minimum of 92 wolves and 22 packs. There are no verified packs in the CW although sightings continue to increase. No confirmed depredations occurred to livestock in the CW in 2014. Livestock depredation is an issue that will continue to affect wolf distribution and management in the future and although no sheep permits are authorized on BLM administered lands in the CW, with an increase of wolves in the CW it is expected that there will be an increase in wolf cattle conflicts. Livestock grazing permits will be amended to make permittees aware that losses to livestock could occur from gray wolves. Even with the introduction of hunting and trapping seasons in MT since de-listing, wolf populations have

continued to increase. None of the alternatives in this EA are expected to impact gray wolf populations that would lead to re-listing the species.

Great Basin Pocket Mouse - *Perognathus parvus*: The Great Basin pocket mouse is scattered throughout the sand hills habitat in the CW. Occupied habitats in Montana are arid and sometimes sparsely vegetated comprised of grassland-shrubland with less than 40% cover, stabilized sandhills, and landscapes with sandy soils, more than 28% sagebrush cover, and 0.3 to 2.0 meters shrub height (Hendricks and Roedel, 2002). Presence is positively correlated with percent sand and negatively with percent clay. Data from other portions of its range suggest a variety of western arid and semiarid habitats are occupied, including pine woodland, juniper-sagebrush scablands, sandy short-grass steppes, and shrubland covered with sagebrush, bitterbrush, greasewood, and rabbitbrush; heavily forested habitats are avoided.

They are not considered a social animal; individuals occupy separate nests. During winter it enters torpor and is not surface-active, they emerge from winter torpor from late March to May, and may also enter torpor for various periods at any season. They are nocturnal or crepuscular when active away from its burrow. They are primarily a seedeater of grasses, legumes, borages, composites, nettles, and mustards, and in spring also feed on insects. Predators in the CW include short-eared owls, coyotes, weasels, skunks, badgers and foxes. Land management designed to maintain a mosaic of sagebrush cover, size, and age classes will benefit this species. The project to destabilize localized areas in the sand dunes is not expected to have an impact on the Great Basin pocket mouse. This species prefers open canopy and the project would increase forage and a mosaic of age classes within shrub cover. None of the alternatives are expected to impact this species that would lead to Federal listing.

Great Gray Owl - *Strix nebulosa*: Great gray owls are the largest owl species in North America and occur in a wide range of habitats and elevations, but prefer forest and meadow associations across their range. Mature and old-growth coniferous and deciduous forests with a high density of snags are preferred for breeding. They do not build their own nests; therefore nest sites include large, broken-top trees, trees with dwarf mistletoe induced witch's brooms and stick nests from other raptors. Forest patches used for nesting do not need to be large but must occur frequently throughout a landscape. Great gray owls prefer natural forest openings such as meadows, bogs, fens for foraging as well as subclimax, old-growth, selectively logged, and small clear-cut forests. Primary prey species are small mammals including rodents such as voles, mice and pocket gophers. They usually forage in open areas where scattered trees or forest margins provide suitable sites for visual searching and perching. Impacts associated with Alternatives B and C from commercial timber harvest would be mitigated as follows: Surveys would be completed prior to any activity and if nesting is found, the units would be modified to avoid nests stands. Timing restrictions would also be imposed to minimize disturbance during the nesting season if nests are found within or directly adjacent to the harvest units. Any impacts associated with this disturbance would not be sufficient to lead to Federal listing of the great gray owl.

Lewis's Woodpecker - *Melanerpes lewis*: Lewis's Woodpecker is migratory, usually showing up in breeding habitat in April and leaving in August. Distribution is strongly associated with fire-maintained old-growth ponderosa pine. Breeding habitat is open, often logged or burned coniferous forest or riparian woodland. Important habitat features include an open tree canopy, a brushy understory with ground cover, dead trees for nest cavities, dead or downed woody

debris, perch sites, and abundant insects. They have been generally considered a species of older burns rather than new ones, moving in several years post-fire once dead trees begin to fall and brush develops. Unlike other woodpeckers, Lewis's woodpeckers are not morphologically well adapted to excavate cavities in hard wood. They tend to nest in a natural cavity, abandoned northern flicker hole, or previously used cavity. Sometimes they will excavate a new cavity in a soft snag, dead branch of a living tree, or rotting utility pole.

Lewis's woodpeckers feed on adult emergent insects (e.g., ants, beetles, flies, grasshoppers, tent caterpillars, mayflies) in summer. They are opportunistic and may respond to insect outbreaks and grasshopper swarms by increasing breeding densities. They do not bore for insects but will fly catch and glean insects from tree branches or trunks; they will also drop from a perch to capture insects on the ground.

Management for Lewis's woodpeckers in dry forests fits very well with the management needs for flammulated owls. The landscape-level needs of the flammulated owl would probably accommodate any habitat-area needs of Lewis's woodpeckers. Specific needs of the Lewis's woodpecker at the microsite and site level could be met in the form of interspersed zones of shrubby understory within the overall habitat mosaic (Casey 2000.).

The burn proposals and timber treatments recommended in this EA would benefit the Lewis woodpecker by promoting aspen and opening up the canopy in crowded Douglas-fir stands to maintain an open canopy Douglas-fir savannah. The projects under the action alternatives in this EA would not negatively impact this species or lead to federal listing, but would have a beneficial effect.

Loggerhead Shrike - *Lanius ludovicianus*: Loggerhead shrikes are the only known predatory songbird. They are migratory in the CW with spring and fall normal migration periods, April 20 to May 15 and August 10 to September 10. Nesting occurs from mid-June through mid-July (MTNHP 2015.) Their diet consists mainly of insects, but it also takes spiders, snails, crabs, crayfish, and small vertebrates such as lizards, amphibians, birds, rodents and even carrion. They are somewhat habitat generalists preferring open and semi-open areas, typically with short vegetation and scattered trees or shrubs but have also been documented in pastures, open woodland, agricultural fields, semi-desert, scrubland, wooded savanna, old orchards, mowed roadsides, parks and golf courses. They require perching sites and thorny trees or barbed wire fences for impaling prey. Improved riparian and upland conditions would improve prey species for the shrike. The prescribed fires may improve habitat by maintain open aspen and Douglas-fir savannah habitat. None of the alternatives in this EA are expected to impact the loggerhead shrike or lead to Federal listing.

Long-billed Curlew - *Numenius americanus*: The long-billed curlew is migratory and arrives in Montana in mid-April. Southbound migrations take place between early July and early September and they winter along the Gulf of Mexico. Throughout much of the Great Basin, Northern Rockies and northwestern portions of the Northern Great Plains, curlews nest in shrub-steppe habitats, generally on sites with low shrub densities, a dominance of grass in the understory, and an open ground component. Virtually all studies of have indicated that relatively short graminoid vegetation is among the key habitat variables selected by nesting

curlews (Casey 2013.) This species forages in open prairie grasslands and meadows, at the edges of prairie ponds and sloughs feeding primarily on invertebrates and also small vertebrates such as bird eggs and nestlings. Livestock grazing, particularly early season grazing, typically has a positive benefit on nesting Long-billed Curlews, although year-round grazing can be detrimental (Dugger and Dugger 2002.) Rocky Mountain Bird Observatory and Breeding Bird surveys in the past two decades have documented that the Long Billed curlew are well represented in the CW. Improving riparian habitat would improve foraging conditions and hiding cover for brood rearing. The alternatives in this EA would not impact this species or lead to Federal listing.

McCown's Longspur - *Rhynchophanes mccownii*: The McCown's longspur is migratory in MT, spring migration occurs from late April to mid-May and fall migration is in September. They are characteristic summer residents of short-grass prairie communities on the western Great Plains of North America. In addition to native prairies, they also regularly occur in overgrazed habitats where the vegetation is very short. The CW is on the edge of its range, but populations in the core of their breeding range in northeast Montana appear to be relatively stable (MTNHP 2015.) Primary threats are from cover type conversion from short grass prairie to cultivated fields and although poorly studied, impacts to winter range has led to declines of this species on breeding grounds in native short grass prairie. Short grass prairie habitat for McCown's longspur is very limited in the CW and no active habitat conversion is expected. None of the alternatives in this EA would impact McCown's longspur that would lead to listing.

North American Wolverine - *Gulo gulo luscus*: The North American wolverine, a large but elusive member of the weasel family found in the mountain west, has made a steady recovery in the past half century after hunting, trapping and poisoning nearly extirpated the species from the lower 48 states in the early 1900s. Wolverine populations in MT have rebounded from historic lows in the early 1900's even with regulated trapping. The USFWS examined potential threats due to human use and disturbance of habitat, trapping, and effects of climate change and found no concentration of threats to suggest that the Distinct Population Segment of North American wolverine may be in danger of extinction in a portion of its range (USDI 2014b). On August 13, 2014, the USFWS withdrew a proposal to list the North American wolverine in the contiguous United States as a threatened species under the Endangered Species Act (USDI. 2014b).

Wolverines occur in coniferous montane forest types preferring rugged, isolated habitats. Home range size for females and males averages 422 km² in Montana (Foresman, 2012) and often move long distances in short periods of time. They naturally occur at low densities and are rarely and unpredictably encountered where they do occur. There is strong support for the existence of an obligate relationship between wolverines and deep spring snow at the den site. Wolverine can be found on National Forest lands adjacent to BLM lands and most likely use the Centennial Mountains as a dispersal corridor, as a few wolverines have been trapped in the CW in the past 10 years (MT Heritage Website 2015).

Small scale timber harvest activities and aspen restoration is not known to impact wolverines as they have shown that they can coexist with some habitat modification. They prefer medium to scattered timber, while areas of dense, young timber were used least and avoided clear-cuts and burns, crossing them rapidly and directly when they were entered at all. Much of the existing

wolverine habitat in the Northern Rockies is already protected through wilderness designations. The Centennial Mountains WSA is managed as a roadless area. BLM lands may be used for foraging and dispersal but the elevation within the project area may not hold enough late season snow pack for denning sites. The proposed timber harvest in this EA are lower elevation primarily Douglas-fir and are designed to promote aspen with an open Douglas-Fir canopy cover and are not clear-cuts. None of the alternatives proposed in this EA are expected to impact the wolverine and lead to Federal listing.

Peregrine Falcon -- *Falco peregrinus*: The peregrine falcon was delisted in 1999. In the mid-1980s there were no breeding pairs documented in Montana. Statewide Montana populations have gone from 14 active eyries in 1994 to 140 known eyries that were monitored in 2014 (Montana Peregrine Institute 2014.) Peregrine falcons are migratory in Montana and arrive to breeding areas in late April to early May; departure begins late August-early September. Peregrine falcons feed primarily on birds, primarily medium-size passerines up to small waterfowl as well as sage grouse. They have occasionally been reported to prey on small mammals (e.g., bats, lemmings), lizards, fishes, or insects. Nests typically are situated on ledges of vertical cliffs, often with a sheltering overhang. Ideal locations include undisturbed areas with a wide view, near water, and close to plentiful prey. Substitute man-made sites can include tall buildings, bridges, rock quarries, and raised platforms such as the hack towers erected in the CW in 1984.

Peregrine falcon management in the CW has centered on re-establishing natural eyries or territories. In the mid-1980s three hack towers were built in the valley along with a hack box placed in Hell Roaring Creek to assist with re-establishing peregrine falcons in the CW. In the last 30 years they have successfully fledged young from the hack towers in most years. Natural eyries have been established in the Centennial Mountains as well. BLM personnel assist the Montana Peregrine Institute with monitoring of six active eyries in the CW yearly.

Two of the hack towers that overlook sage grouse leks and brooding habitat would be removed under the action alternatives. The intent of the hack towers never was to maintain them long term, but for the peregrines to establish natural nesting habitat. The removal would be done outside of the breeding season so the returning falcons could re-locate upon spring migration. Removal of the hack towers would be consistent with current greater sage grouse management to remove tall structures that assist predators in becoming more effective. Due to the increase in population state wide in the past 20 years and availability of natural nesting features in the CW, removal of the hack towers is not expected to impact the peregrine falcons and lead to Federal listing.

Pygmy Rabbit - *Brachylagus idahoensis*: Pygmy rabbits are endemic to sagebrush and are the only rabbit on the continent to dig their own burrows requiring sagebrush for forage and cover, as well as deep alluvial soil to dig burrows. Sagebrush comprises nearly 100% of their winter diet and over half of their summer diet. Estes-Zumpf (2008.) recently documented that the ID and MT populations are genetically linked and much more mobile than previously thought. Pygmy rabbits are found throughout the CW in suitable sagebrush habitat. They still occupy all of their historical range in Montana and DFO staff and the Montana Heritage Program have documented occurrences outside of the historic range in Montana in past years (Hendricks et al.

2007). Pygmy rabbit populations that were documented by Rauscher (1997) as well BLM personnel in 2004-05 were still active throughout the CW in 2013 and 2014.

A recent study in the DFO (Camp et.al. 2014) concluded that the presence of cattle did not markedly influence properties of vegetation related to predation risk or integrity of burrow systems when grazing is permitted at sustainable levels. This is evident by the fact that pygmy rabbits have persisted in the in the CW in known areas for the past 20 years under current management. Pygmy rabbits have not been documented in any of the proposed burn units, as most of them are in or directly adjacent to forested habitat. They are known to occur near the corral west unit, but with the high density colonizing Douglas-fir, it is doubtful that this unit is occupied. A survey would be completed prior to implementation to determine occupancy and unit boundaries would be modified to preserve the best habitat. No prescribed fire units are identified within the primary occupied habitat in the valley and on the North side of the valley. None of the alternatives in this EA are expected to impact pygmy rabbits that would lead to Federal listing.

Sagebrush Sparrow - *Artemisiospiza nevadensis*: The sagebrush sparrow occurs in contiguous areas of big sagebrush primarily in the Great Basin, and is uncommon in the southwestern and south-central part of Montana as this is the northern extent of its range. They prefer tall, dense stands of big sagebrush with high vertical and horizontal heterogeneity. In Montana, adults arrive on breeding grounds beginning in late March, nests in June and July and migrates south in September. Breeding bird surveys in the CW have not documented the sagebrush sparrow (MTNHP 2015) but breeding habitat is very similar to the sage thrasher (see below.) Loss or fragmentation of intact sagebrush landscapes due to wildfire and cheatgrass invasion post fire will eliminate habitat for sagebrush sparrows. This has generally not been a threat in the CW as sagebrush habitat is intact and current management is compatible with sustaining conditions. None of the alternatives in this EA are expected to impact the sagebrush sparrow that would lead to Federal listing.

Sage Thrasher - *Oreoscoptes montanus*: The sage thrasher is North America's smallest thrasher. It is a migratory breeder in Montana arriving in late April through mid-May and fall migration begins in August. Sage thrasher abundance is positively correlated with sagebrush cover and bare ground and negatively correlated with grass cover (Reynolds et al. 1999) and appears to prefer flat terrain. Nests are built deep within or under sagebrush shrubs in relatively dense big sagebrush and three-tip sagebrush habitat and appears to be positively correlated with vertical heterogeneity and “shrubbiness.” They are rarely found outside that habitat during the summer breeding season. There have been reports of male sage thrashers displacing Brewer’s sparrows and sage sparrows when establishing breeding territories in the spring, suggesting possible interspecific competition for nest-sites (Reynolds et al. 1999.) They primarily forage on the ground for grasshoppers, caterpillars, beetles and other insects although they will also feed up in low bushes and scrub.

Conservation of large, intact sagebrush stands with high structural complexity is critical to maintaining habitats for the sage thrasher (Reynolds et al. 1999.) However, burning habitat to create a mosaic pattern appears to be compatible with sage thrasher. After prescribed fire in SE Idaho, in which 45% of the study area burned in a mosaic pattern and cover of sagebrush was

reduced from 23 to 12%, density of breeding sage thrashers did not change significantly (Peterson and Best 1987.) The largest concentration of documented sage thrashers is on the north side of the valley. No burn units are identified on the north side of the CW therefore these projects would not affect sage thrashers. None of the alternatives in this EA are expected to impact sage thrashers that would lead to Federal listing.

Trumpeter Swan - *Cygnus buccinator*: Trumpeter Swans are the largest waterfowl in North America. Swans must remain near open water to obtain their preferred diet of aquatic plants that includes waterweed, pondweed, water milfoil, and duck potato. They also feed occasionally on grain, seeds, freshwater invertebrates, snails, and worms. Favorite nesting sites are on muskrat houses or in broad beds of marsh plant. The population in the Greater Yellowstone Ecosystem (GYE) Tri-state area (consisting of MT, ID and WY) is currently over 500 and survey efforts in 2012 recorded the highest count since 1990 (USFWS, 2013.) Between the late 1980's to early 1990's trumpeter swans were relocated from Red Rock Lakes National Wildlife Refuge (RRLNWR) in the CW to locations in Idaho, Oregon, Wyoming and Utah to promote exploration of new wintering habitats. This also helped to remedy the increasing problem of overpopulation in the refuge during winter due to a winter feeding program from 1936-1992. Since the winter feeding program on the RRLNWR was terminated in 1992 winter distribution has shifted as Montana wintering populations have decreased and Idaho and Wyoming winter populations have increased. Even with the termination of the winter feeding program the number of swans wintering in the tri-state region has increased since 1972.

Compared to other regional subpopulations, they are as productive as any other in the GYE (Roscoe 2011.) In the CW, 32 trumpeter swan nesting territories have been identified west of the RRLNWR. However, almost all of these territories have influences outside of the control of the BLM (primarily water fluctuations for irrigation.) The proportion of cygnets for swans counted in the tri-state region during winter 2014 was the lowest on record and a 47% decrease from the 1974-2013 average. However, the poor proportion of cygnets counted in the tri-state region may be due to the survey being compromised by weather conditions as production in 2013 was near the long term average (USFWS, 2014.)

Loss of wetlands remains the largest threat to trumpeter swan populations. In the past 10 years, the DFO has worked cooperatively with the Trumpeter Swan Society and Ducks Unlimited (DU) to create wetlands and excavate old oxbows along the Red Rock River in historic swan nesting territories. To date, no nesting has been documented on the excavated oxbows, but two of the DU ponds have had nesting pairs in the years when adequate water levels were maintained. The DFO will continue to work in cooperation with supporting agencies and the Trumpeter Swan Society to ensure their presence in the CW. None of the alternatives in this EA are expected to impact or eliminate existing wetland habitat that would lead to Federal listing of the trumpeter swan.

Veery - *Catharus fuscescens*: Veerys are summer migrants arriving in May and departing in September. They are widespread throughout Montana but are considered uncommon on the RRLNWR and although they have not been documented on BLM lands in the CW, habitat is present. Veerys are often associated with willow thickets and aspen along streams and lakes in valleys and lower mountain canyons and can be found in a variety of forested plant communities as long as willow is a significant component. They are primarily a ground forager feeding on

insects during breeding season and on fruit during late summer and fall. Their susceptibility to cowbird parasitism makes it vulnerable to landscape changes and disturbances (Casey 2000.) However, it may favor disturbed forests where the understory shrub layer is denser than in undisturbed sites. The proposed aspen restoration and timber harvests that promote understory shrub growth would be beneficial to the veery. Over grazing can lead to an increase in cow birds which in turn leads to increased parasitism. All of the grazing AMP's are managed for moderate grazing and would not have a significant impact. Managing or improving the riparian habitat to meet PFC and increase riparian woody regeneration would also be beneficial. None of the alternatives in this EA would impact the veery that would lead to Federal listing.

White-faced Ibis - *Plegadis chihi*: White-faced Ibises are migratory usually arriving in Montana in May, begin their southern movement in August, and by September they are usually gone from the state. They typically feed in freshwater marshes on crayfishes, frogs, fishes, insects, newts, earthworms and crustaceans. They usually nests in emergent vegetation or low trees and shrubs over shallow water, but they can nest on the ground on small islands as well. Nesting colonies are often shared with black-crowned night-Herons and Franklin's gulls, both of which may prey on white-faced ibis chicks or eggs (MTNHP 2015.) The total population in North America apparently increased from 1970's to 1990's. During that same period breeding range has expanded eastward. Montana is on the northern extent of its range and prior to 1970, no breeding records existed for Montana. Even into the early 1980's only a few scattered breeding instances were observed. Since the mid-1980's, white-faced ibis numbers in known colonies have increased and new colonies have been located (MTNHP 2015).

The primary habitat for this species in the CW is on the RRLNWR, this corresponds with most observations in the CW. White-faced ibises are extremely dependent on appropriate wetland habitat and water level consistency. All white-faced ibises in Montana currently breed in colonies located within water units managed for waterfowl. Active management of water level can and does impact the breeding ibises in managed wetlands. Conscious management of water levels for waterfowl that include white-faced ibises would maintain or enhance nesting habitat for the species. Although they have not been documented nesting in the DU ponds on BLM lands in the CW, maintaining consistent water levels during the breeding season would benefit this species by providing potential nesting habitat. None of the alternatives in this EA are expected to impact wetland complexes in the CW that would lead to Federal listing of the white-faced ibis.

Western Toad – *Bufo boreas*: This species is widely distributed throughout the Northwest and Rocky Mountains (Werner et. al 2004.) According to the Montana field guide online, current trends of decline throughout the state remain obscure, but are assumed to be from an increase in predation and loss of breeding habitat. Breeding habitat includes low elevation beaver ponds, reservoirs, streams, marshes, lake shores, potholes, wet meadows, and marshes, to high elevation ponds at or near treeline. Forest cover around occupied montane wetlands may include aspen, Douglas-fir, lodgepole pine, Engelmann spruce, and subalpine fir. A long list of predators of adult western toads include raccoon, domestic dog, coyote, red fox, weasel, mink, marten, badger, black bear, northern pygmy-owl, black-billed magpie, raven, crow, Steller's jay, gray jay, robin, loggerhead shrike and northern shrike. Predators of western toad tadpoles include

mallard, spotted sandpiper, terrestrial garter snake, tiger salamander, wood frog tadpoles, and diving beetle larvae.

Western toads have been documented in the CW primarily on the RRR but breeding habitat probably occurs within the allotments in the valley bottom due to the high concentration of wetlands and potholes in the valley. Reduced access by livestock to known breeding sites within grazing allotments can prevent undue trampling mortality. Maintaining existing and constructing new livestock exclosures to improve riparian habitat can benefit breeding populations. No breeding habitat exists in the forestry treatment units and operations would occur during the day; therefore mortality caused from equipment operations is expected to be negligible. The alternatives in this EA may impact individuals but is not expected to lead to federal listing.

Westslope Cutthroat Trout (WCT) - *Onchorhynchus clarkii lewisi*: Current management on the majority of occupied WCT habitat has habitat meeting PFC standards. Proposed changes should result in further improvements to stream bank vegetation, stream banks stability, channel morphology all of which should help reduce sedimentation. The proposed timber harvest and burn units are unlikely to have a negative impact to WCT due to adequate vegetative buffers between treatment units and WCT streams. It is likely that they will have a beneficial impact by increasing understory vegetation which will draw livestock away from WCT habitat. The riparian conifer treatment projects and beaver mimicry structures are expected to improve habitat in localized areas. The alternatives proposed in the CW would be beneficial to WCT habitat and populations.

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