Medicine Bow National Forest
Routt National Forest

2008 Monitoring Report
Medicine Bow NF 5 Year Evaluation
Routt NF 10 Year Review

Fiscal Years 2004 to 2008
October 1, 2003 through September 30, 2008

United States Forest Service
Rocky Mountain Region

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Certification

The Medicine Bow National Forest Land and Resource Management Plan (Medicine Bow Plan) Record of Decision (ROD) was signed on December 29, 2003. The Routt National Forest Land and Resource Management Plan (Routt Plan) Record of Decision (ROD) was signed on February 17, 1998. The Plans are dynamic documents, subject to change based on annual monitoring and evaluation as we implement them. Monitoring is intended to provide me with information necessary to determine whether the Plans are sufficient to guide management of the Medicine Bow and Routt National Forests for the subsequent year or whether modification of the Plans or if modifications of management actions are necessary.

I have reviewed the Five Year Review and 2008 Annual Implementation and Monitoring Report for the Medicine Bow and Routt National Forests that was prepared by the Forest Interdisciplinary Team (IDT). Overall, the 2008 Monitoring and Evaluation results indicate that the management of both Forests meets goals, objectives, standards and guidelines, and management area prescriptions. I believe that the results of monitoring and evaluation for FY08 meet the intent of Chapter 4 of the two Forest Plans. I also believe that the monitoring and evaluation requirements displayed in Chapter 4 of the Forest Plans have been met, and that the decisions made in the Forest Plans are still valid.

The Forest IDT has not identified any modifications to the Plans or adjustments to management actions. The Medicine Bow Plan and Routt Plan are sufficient to continue to guide management of the Forests.

Please contact Frank Romero at the Medicine Bow-Routt National Forests, 2468 Jackson Street, Laramie, Wyoming, 82070, or call (307) 745-2300, if you have any specific concerns, questions, or comments about this report.

/s/ Phil Cruz

PHIL CRUZ
Acting, Forest Supervisor

09/29/2010

Date

Introduction

The Medicine Bow and Routt National Forests and Thunder Basin National Grassland are managed under the administrative unit known as the Medicine Bow-Routt National Forests and Thunder Basin National Grassland extending into the states of Wyoming and Colorado. Since there are three Land and Resource Management Plans that provide guidance for the National Forest System (NFS) lands managed on this unit, we are required to prepare three annual monitoring and evaluation reports. In an effort to streamline costs for field work and report preparation and because the forested ecosystems are similar and provide for similar multiple uses, reporting for the Medicine Bow and Routt portions of the unit have been combined into a single annual monitoring report since 2004. Similar monitoring items have been combined. This single report is intended to meet the requirements of monitoring and evaluation for the implementation of the two Forest Plans.

The National Forest Management Act (NFMA) requires specific legally required monitoring items for forest and grassland plan implementation as well as additional monitoring that will be conducted based on the availability of funding and personnel.

This report contains the 2008 annual monitoring results as well as the five year review. Fiscal Year 2008 is the fifth year of implementation of the Medicine Bow National Forest Revised Land and Resource Management Plan (Medicine Bow Plan) and the tenth year of implementation of the Routt National Forest Revised Land and Resource Management Plan (Routt Plan). This report includes reporting on all monitoring items in Chapter 4 of both forest plans. The previous 5-year evaluation of the Routt Plan was completed in 2005, and is available, in addition to the annual monitoring reports for both forests on the following website:

http://fs.usda.gov/goto/mbr/planning

A Watershed Condition Assessment was completed as part of the 5 year review, and to update the watershed condition analysis to meet current NFS direction. Results of this assessment are summarized in the related monitoring items included in this report.

The Medicine Bow National Forest contains 1,095,384 acres of National Forest System lands in southeast Wyoming. The Forest includes four units in three distinct mountain ranges; the Laramie Range, the Medicine Bow Mountains, and the Sierra Madre Mountains. The Continental Divide crosses the Forest for approximately 45 miles. The major river drainages are the Green River Basin that flows west into the Colorado River system and the western Dakota sub-Basin that flows into the Platte River to the east. Elevations range from 5,050 feet above sea level in the Laramie Range to 12,013 feet above sea level at Medicine Bow Peak. More than 50 percent of Wyoming's population lives in the vicinity of the Forest. Timber harvest and domestic livestock grazing have been historic uses on the Forest since before the turn of the century. The Forest provides a wide variety of recreation activities, including hunting, snowmobiling, skiing, hiking and camping.

The Routt National Forest contains 1,125,568 acres of National Forest System land within northwest Colorado. In addition to the management direction for the Routt National Forest, the 1997 Routt Revised Plan contains direction for the 85,350 acres of the Arapaho National Forest administered by the Routt National Forest; as well as the 104,744 acres of the Williams

Fork Area of the Arapaho National Forest, administered by the Arapaho Roosevelt National Forest. The Forest is a varied mix of high plateaus, rolling foothills, and mountains. Many of the mountains exceed 13,000 feet in elevation. The Continental Divide crosses the Forest for approximately 113 miles. Though most of the Forest can be called "remote and undeveloped", it still provides a high level of multiple use values for people, including outstanding wildlife habitat, important watersheds, valuable recreational opportunities, timber, livestock, minerals, and other natural resources.

Goals and Objectives

The first chapters of both the Medicine Bow and Routt Plans, lists the Goals and Objectives to be accomplished through National Forest management. Goals and objectives provide broad, overall direction regarding the type and amount of goods and services the National Forests provide and focus on achieving ecosystem health and ecological integrity. The progress made toward all of these objectives for both of the plans is listed in Appendices 1 and 2.

Goals are concise statements that describe desired conditions, and expected to be achieved sometime in the future. They are generally timeless and difficult to measure. Goals describe the ends to be achieved, rather than the means of doing so.

Objectives are concise, time-specific statements of measurable, planned steps taken to accomplish a goal. They are generally achieved by implementing a project or activity.

The goals and objectives in the Medicine Bow Revised Forest Plan are tiered to the *USDA Forest Service Government Performance and Results Act Strategic Plan: 2000 Revision (GPRA)*. This strategic plan presents the goals, objectives and activities that reflect the Forest Service's commitment to a sustainable natural resource base for the American people. The Routt Forest Plan pre-dates the GPRA legislation; however the goals in the Routt Plan are consistent with the strategic plan. All goals and objectives fall under the overall mission of the Forest Service, which is to sustain the health, productivity, and diversity of the land to meet the needs of present and future generations. "Caring for the Land and Serving People" expresses the spirit of this mission. Implicit in this statement is the agency's collaboration with people as partners in caring for the nation's forests and rangelands.

The Forest Service's mission, strategic goals and objectives are derived from the laws defining and regulating the agency's activities. Goals and objectives describe tangible progress toward achieving the agency's mission through implementing land and resource management plans. These plans guide on-the-ground natural resource management to ensure sustainable ecosystems and to provide multiple benefits. The Forest Service is committed to achieving the stated goals and objectives.

Conclusions and Recommendations

The primary finding from the fiscal year (FY) 2008 report is related to the expanding bark beetle epidemic. More details can be found under the *Insect and Disease* monitoring item. The IDT developed Forestwide recommendations related to this and other resource areas. Numerous additional recommendations are contained within the monitoring items in this report concerning ways to improve both monitoring and forest resource management.

Conclusions

- The forests will have much larger areas of young forest and much less older forest resulting in changes to watersheds, habitats for wildlife species.
- The changes in habitats will reduce habitat for some management indicator species (MIS) and sensitive species (SS), while other species will gain habitat.
- The tree mortality and hazards from falling trees will have large effects on virtually all infrastructure on the forest which may result in increased safety hazards.
- Rangeland management will become much more difficult due to damage to fences, and from changes in transitory range and natural barriers.
- Invasive weed species will likely increase in coverage across the forests.
- Fire risk and fuel loading has changed and will continue to change over time as trees die and fall over.
- SIAs and RNAs with lodgepole pine stands may change, but current forest plan direction is still valid.

Action Recommendations

- Evaluate specific forest direction (desired conditions, goals, objectives, standards and guidelines) related to MIS/SS habitat, old growth (MBNF), and late successional forest (RNF) to determine if additional direction and/or modification is needed to make the plans relevant to the changed conditions.
- Incorporate the language and terminology found in the new federal wildland fire policy into the forest plans in order to avoid confusion while analyzing fire management strategies in any given area.
- Continue treating hazard trees around forest infrastructure and administrative sites.
- Complete a forestwide assessment of the watersheds which are most at risk of adverse effects to aquatic systems, public water supplies, and other infrastructure due to large scale fire.
- Continued emphasis on travel management, use of the recently created Motor Vehicle Use Maps, and an active restoration program are necessary to ensure properly functioning riparian and wetland conditions on the Forest.
- Develop a comprehensive strategy to address streamflows while still recognizing the need for additional consumptive uses of water
- A sample of soil and water mitigation measures undertaken should be monitored during and after implementation to determine the effectiveness for protecting water quality.

- Review forest plan standards, in both forest plans, relating to snag retention in harvest units, in light of the amount of tree mortality from the MPB epidemic which will result in high densities of snags across the forests.
- Limit and/or reduce disturbance in remaining late successional forest habitats and near fen/wetland habitat to maintain certain elements of plant diversity. Provide interim direction.

Actions Taken on FY07 Recommendations

Insects and Disease

The rate of spread of mountain pine and spruce bark beetle that the Forests have experienced in the last few years will probably continue for the next 3-5 years. Any vegetative management in lodgepole pine and spruce should anticipate what the condition of the stands will be in 3-5 years. In the past, forest managers have implemented silvicultural strategies to suppress beetle epidemics when recommending silvicultural treatments, and still suffered extensive mortality in the residual stands. When recommending vegetation treatments in moderate to high risk stands for beetle infestation, the forest manager should anticipate extensive mortality and consider using adaptive management and include the option for salvage treatments and reforestation of the affected stands.

The forests' program of work has centered around addressing the Mountain Pine Beetle epidemic, with emphasis on reducing hazard trees around campgrounds, facilities, cabins and roads.

Forest Plan Implementation

Continue Design Criteria and BMP implementation and effectiveness monitoring to ensure that Design Criteria are effective at meeting Forest Plan Standards and Guidelines. Resource specialists should continue to work cooperatively with all resource areas during project planning and implementation.

Pursue additional BMP implementation training over the next 2 years to increase awareness of methods of meeting BMP and design criteria.

The forest continues to monitor project implementation, including BMP implementation and effectiveness. It is likely that training in BMP implementation will not occur over the next several years due to the focus on the MPB epidemic.

Medicine Bow Plan Water and Aquatic Standards

Review the Medicine Bow Revised Forest Plan Water and Aquatic Standards for consistency with national and regional forest service direction, and for consistency with applicable law.

The Water and Aquatic Standards were reviewed and an administrative correction issued on April 24, 2009. Administrative Correction #4 can be viewed on this website:

http://fs.usda.gov/goto/mbr/mbforestplan

Forest Plan and Policy Updates

Adjustments to the Forest Plans

The Medicine Bow Revised Forest Plan was approved in 2003. Since then, the Forest has issued six errata and four administrative corrections. One site specific amendment has been approved for the Medicine Bow Plan in addition to the Lynx Amendment and the Energy Policy Act (EPAct) of 2005 Section 368 Westwide Energy Corridor Amendment described below. This site specific amendment was issued in the Eastern Snowy Range Travel Management decision for Albany Trail. The amendment changed roughly 422.5 acres of Forest Plan Management Area (MA) 1.33 - Backcountry Recreation, Summer Non-motorized with Winter Snowmobiling north of Albany to MA 3.31 – Backcountry Recreation, Year-round Motorized. A link to this decision can be found at: http://fs.usda.gov/goto/mbr/projects/srtravelmgt

The Routt Plan was approved in 1998. Since then, five amendments, three administrative corrections and three errata have been issued. The Lynx Amendment and Routt MIS Amendment are described below. The other three amendments concern salvage in scenic river corridors (Amendment #1), relocation of the Luna Lake Trail (Amendment #2) and winter recreation (Amendment #3). In 2007, two administrative corrections were issued. One correction is related to transferring the direction of the Williams Fork area from the Routt NF back to the Arapaho-Roosevelt NF. The other administrative correction adjusted wording of the Water and Aquatic Standards to be more consistent with applicable laws. As mentioned earlier, the Plans are dynamic and ever changing. For more information on these changes to the Routt Forest Plan and to stay current with these Plans, please refer to the following internet website: http://fs.usda.gov/goto/mbr/routtforestplan

Routt MIS Amendment

The Routt Five-Year Review and 2003 Implementation and Monitoring Report identified the need for a Management Indicator Species amendment for the Routt Forest Plan. The Decision Notice for the amendment was signed in February 2007. The amendment and Decision Notice can be found on the Medicine Bow – Routt (MBR) website:

http://fs.usda.gov/goto/mbr/planning

Southern Rockies Lynx Amendment

The Supplemental Draft Environmental Impact Statement for the Southern Rockies Canada Lynx Amendment was released in November 2006 and the Record of Decision was signed in October 2008. This amendment amends eight forest plans to better conserve the threatened Canada lynx on national forests in Colorado and southern Wyoming, including both the Routt and Medicine Bow National Forests. The Final EIS and Record of Decision are available on the following website: http://fs.usda.gov/goto/mbr/routtforestplan

Energy Policy Act (EPAct) of 2005 Section 368 Westwide Energy Corridor Amendment

The Energy Policy Act of 2005 directs the Secretaries of Agriculture, Commerce, Defense, Energy, and the Interior to designate energy transport corridors for oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities on Federal lands in portions of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming. The Act further directs that environmental reviews be completed for the designation of such corridors, and that the designated corridors are incorporated into

the relevant agency land use and resource management plans or equivalent plans. The Final Programmatic Environmental Impact Statement supporting this decision was published on November 28, 2008. The PEIS identifies 332,734 acres of NFS lands for Section 368 energy corridors.

Copies of the Record of Decision and Final Environmental Impact Statement are available upon request from Forest Supervisor's Offices in the eleven western states or the Washington Office of the Forest Service. These documents will also become available on the Project Web site at: http://corridoreis.anl.gov/

New Laws and Regulations

Planning Regulation Update

The Forest Service is currently operating under the transition provisions of the 2000 Planning Rule, as an interim measure until a new planning rule is issued. The 2000 rule allows forests to develop, revise and amend forest plans using the procedures of the 1982 Rule.

The 2005 Planning Rule and the 2008 Planning Rule were both enjoined by the Northern District Court of California. The 2000 rule legally came back into effect when the 2008 rule was set aside.

Travel management

The Travel Management Rule announced in 2005 requires each National Forest and Grassland to identify and designate those roads, trails, and areas that are open to motor vehicle use. Forests and Grasslands in the Rocky Mountain Region are seeking public input and coordinating with federal, state, county, and other local governmental entities as well as tribal governments to implement the rule.

The Routt National Forest published the Motor Vehicle Use Maps (MVUM) in September 2007 and the Medicine Bow National Forest published MVUM maps in 2008. These maps display routes that are designated for motorized use. These maps and more information can be found at the following website: http://fs.usda.gov/goto/mbr/mvum/maps

Roadless Area Conservation

Colorado Roadless Rulemaking
The State of Colorado and the US Forest Service have begun work on a state-specific rule that will guide management of over four million acres of roadless National Forest lands in Colorado.

The rulemaking process began with Under Secretary of Agriculture Mark Rey's acceptance of Governor Bill Ritter's petition to pursue state-specific rules. Rulemaking will continue with publication of a Notice of Intent in the Federal Register, joint development and release of a draft Rule and Environmental Impact Statement (EIS), then finalization and release of the final Rule, EIS, and Record of Decision. More information is available on the following website: http://roadless.fs.fed.us/colorado.shtml

Wyoming Roadless Status

In 2001, the Forest Service enacted the Roadless Rule, which essentially prohibited road construction and reconstruction and timber harvesting, subject to certain limited exceptions, in inventoried roadless areas on a uniform nationwide basis.

In July 2003 the Wyoming District Court issued a nationwide permanent injunction against the Roadless Rule.

On May 5, 2005, the Forest Service adopted the State Petitions Rule, which is a process to provide Governors an opportunity to establish or adjust management requirements for National Forest System inventoried roadless areas within their States.

In September, 2006, a U.S. District Court in California reinstated the 2001 Rule and set aside the State Petitions Rule.

In August 2008, the U.S. District Court for the District of Wyoming issued a permanent injunction and set aside the 2001 Rule.

In December 2008 the U.S. District Court in California stayed its injunction outside of the 9th Circuit and New Mexico in the interests of judicial respect to other jurisdictions, pending further action by the Wyoming court or the Tenth Circuit.

On May 28, 2009 Secretary of Agriculture Tom Vilsack signed an interim directive reserving the authority to the Secretary for the approval or disapproval of road construction/reconstruction and the cutting, sale or removal of timber in inventoried roadless areas.

In June 2009 District Court Judge Brimmer (Wyoming) denied the government's motion to reconsider the scope of his nation-wide injunction of the 2001 roadless rule, and denied Wyoming Outdoor Council's motion for stay pending appeal. The Judge declined the government's request to conform his injunction to the California injunction, so the District Court's nationwide injunction of the 2001 rule remains in place.

Information regarding roadless can be found at the following website:

http://www.roadless.fs.fed.us/

Projects and Ongoing Activities

Community Involvement

This section includes descriptions of the task forces, community groups and other working groups, working with or on issues associated with the Medicine Bow-Routt NFs.

Bark Beetle Epidemic
The aftermath of a landscape-scale mountain pine beetle and spruce beetle epidemic is a major focus for community involvement, education and information. On November 6, 2009, the Regional Forester signed a delegation of authority with a National Incident Management Organization (NIMO), which assumed command of the bark beetle incident on the Medicine Bow-Routt, Arapaho-Roosevelt and White River National Forests for the next two years. More than 3 million acres of lodgepole pine in northwest Colorado and southern Wyoming have been killed by the beetle epidemic.

The primary emergency is the eminent danger presented by dead and dying trees that are falling at an ever increasing rate across the impacted area. Secondarily, the threat of catastrophic wildfire continues to grow, putting communities and critical watersheds at risk.

The Delegation of Authority outlines objectives, budget, and communication expectations for the next two years.

The Bark Beetle Incident Management Team, formed by Region 2 in 2007 to facilitate aggressive and coordinated forest treatments on the Medicine Bow-Routt, Arapahoe-Roosevelt and White River National Forests, will work in coordination with the NIMO team, as will all three forests. More information can be found at: http://www.fs.fed.us/r2/bark-beetle/index.html

Additionally, the MBR forest worked with the Wyoming State Forestry Division, the Society of American Foresters and the University of Wyoming and the State Forest Services in Wyoming and Colorado on educational efforts, including interpretive signs, brochures and other publications.

The Bark Beetle Information Task Force (BBITF) was formed in the spring of 1999 to help residents of Routt County and surrounding areas understand potential effects of bark beetles on national forests and private land. The Task Force includes representatives from the State Forest Service, the Medicine Bow-Routt National Forests, Colorado State University Cooperative Extension, City of Steamboat Springs, Routt County, Steamboat Ski and Resort Corporation, Steamboat Chamber Resort Association, Inc., Community Agriculture Alliance and Colorado State Parks.

The Task Force's mission is to provide the public with information about bark beetles and potential tree mortality so they can make informed decisions regarding protection of their private property and provide meaningful input regarding proposed actions on public lands. In 2001, the Task Force expanded its mission to include education about the role of fire in the ecosystem, fire prevention for homeowners, and fuel reduction projects in wildland urban interface areas.

Members of the Task Force participate in discussions with civic groups, homeowners' associations, Forest Service tours and meetings, and other gatherings of people interested in bark beetles, and provide information to the media.

The Task Force continues its education efforts. In 2009, it organized and participated in interviews for Homelink Magazine's special issue on the use of blue-stain wood. It also worked with Steamboat Springs High School videography students on the production of a hazard tree awareness for use of websites and other venues.

In 2008 The BBITF embarked on a "Bluestain Campaign" to promote the use of blue-stain lodgepole pine. The group also hosted a series of educational presentation for the community about uses of beetle-kill trees.

In 2007, the group published "Our Future Forests," a publication about utilizing beetle kill wood and looking toward the future forests, after the beetle epidemics.

In 2007, the BBITF received a grant from the City of Steamboat Springs for $7,000 to be used to explore uses for woody biomass in the wake of beetle epidemics.

Colorado Bark Beetle Cooperative – The Cooperative was formed in late 2005 and major efforts were embarked on in 2006 to bring attention to beetle epidemics and form short-term and long-term strategies to deal with beetle epidemics and prepare for the future forest. The Cooperative has a Steering Committee, Communications Team and an Implementation Team.

The Colorado Bark Beetle Cooperative is a collaboration of federal and state agencies, counties, municipalities and communities working together to develop and implement strategies to reduce forest mortality in high priority areas and associated adverse effects.

Goals: To develop short-term (less than two years) and long-term (beyond two years) strategies for addressing tree mortality from bark beetle epidemics; develop action plans necessary to implement the strategies; and work collaboratively to carry out the work.

Members of the Colorado Bark Beetle Cooperative participated in numerous media interviews, made trips to the Forest Service Washington Office and to members of Congress to bring attention to the severe beetle epidemics being experienced in Northern Colorado. The group also conducted several tours for local and national elected officials and the media. The Cooperative's efforts continued in 2008 and 2009.

The **Routt County Public Information Officers** group was formed in 2006. It involves information officers from the county, city, schools, airport, hospital, emergency response, the Forest Service and others. The focus is to train together and share information, so that when an emergency (fire, plane crash, etc) occurs we are all set to work together. We hope to be involved in a similar effort on the Wyoming side in 2010.

Medicine Bow Forest Plan Cooperators
In 2006 Medicine Bow-Routt NFs and Thunder Basin NG Forest Supervisor Mary Peterson signed a Memorandum of Understanding (MOU) with the Southeastern Wyoming Conservation Districts. The conservation districts had a signed MOU with the Medicine Bow NF during the formulation of the revised Medicine Bow Land and Resource Management Plan.

- This MOU was established between the Medicine Bow NF and the Conservation Districts to provide for a cooperative working relationship during the implementation of the Medicine Bow National Forest Land and Resource Management Plan (LRMP).
- The Medicine Bow NF hosts two bi-annual meetings with the Conservation Districts and other interested agencies. One meeting is in the office to provide an opportunity to discuss past and upcoming projects. The second is a field day where we are able to visit projects that have occurred and discuss what has worked and what hasn't in the context of the revised plan.
- The biannual meetings are well attended with the field day having the most participation.
- During the spring meeting, this provides an opportunity for the District Rangers to present to the "Cooperators" upcoming projects that they may wish to be involved with.
- The Conservation Districts have been "Collaborators" on HFRA Projects.
- Two of the Conservation districts have been successful in acquiring two stewardship projects. One project is on the Brush Creek Hayden Ranger District, and the second is on the Laramie Ranger District.
- In cooperation with the Conservation Districts we have used these stewardship projects to demonstrate to numerous interested parties how stewardship can work, and how it is a mutual benefit to both the Conservation Districts and the Medicine Bow NF.

The Colorado Roadless Areas Review Task Force – In 2005, a bipartisan 13-member group was created under Colorado Senate Bill 05-243 to help determine the future of roadless areas in Colorado. Based on public comment, the task force made recommendations to then-Colorado Governor Bill Owens regarding how inventoried roadless areas should be managed. In November 2006, Governor Owens submitted a petition to the United States Forest Service on behalf of the State of Colorado with guidelines to manage the state's 4.1 million acres of roadless areas. The petition requests that ski area special uses be removed from the roadless inventory. It has special provisions for certain mineral interests and selectively allows some road construction and reconstruction, in addition to some new temporary roads, primarily for public safety. Tree harvest is selectively allowed. Colorado's new governor, Bill Ritter resubmitted the petition, with some modifications, to the USDA. The State of Colorado and the Forest Service are working on a state-specific rule that began with Under Secretary of Agriculture Mark Rey's acceptance of Governor Bill Ritter's petition to pursue state-specific rules. A Notice of Intent was published in the Federal Register December 26, 2007, this will be followed by joint development and release of a draft Rule and Draft Environmental Impact Statement (DEIS), then finalization and release of the final Rule, Final EIS, and Record of Decision. The new administration is addressing the roadless area issue again in 2009.

Projects Completed During FY08

Tables 1 through 3 below list the environmental analysis projects completed on the Medicine Bow and Routt National Forests during Fiscal Year (FY) 08. The types of decisions under the National Environmental Policy Act (NEPA) include Decision Memos (DMs) for actions that fall under categorical exclusions, Decision Notices (DN) for Environmental Analyses (EAs) and Record of Decisions (RODs) for Environmental Impact Statements (EIS). The project lists were generated from the database that produces the Schedule of Proposed Actions (SOPA). The SOPA quarterly report is available at the following internet website:

http://www.fs.fed.us/sopa/forest-level.php?110206

Table 1. Projects covering both Medicine Bow and Routt NFs completed in FY08

Name	Decision Type	Date Signed	Primary Purpose
Hazard Tree Reduction-Medicine Bow-Routt NFs	DN	8/12/08	Facility management, Fuels / Vegetation management

Table 2. Medicine Bow NF projects completed in FY08

Name	Decision Type	Date Signed	Primary Purpose
Brush Creek/Hayden Ranger District (BCH)			
Prospect Mountain Prescribed Burn	DN	3/17/08	Fuels / Vegetation Management, Wildlife Habitat Improvement
Sandstones Rangeland Analysis	DN	9/30/08	Grazing Management
White Rock Estates WUI Fuels Project	DN	5/8/08	Fuels Management
Battle Mountain Fence Extension	DM	9/23/08	Grazing Management
Sandstone Prescribed Burn	DM	8/27/08	Facility / Fuels / Vegetation management
Hartt Creek C&H Fence	DM	9/25/08	Grazing Management
BCH Platte River Ditch Bill Easements: Batch #1	DM	2/26/08	Special Use Authorizations
Blackhall Mountain SNOTEL	DM	9/17/08	Special Use Authorizations
Grand Slam Outfitters	DM	8/1/08	Special Use Authorizations
McKee Pasture Permit Renewal	DM	6/6/08	Special Use Authorizations
Ten-Mile Gravel Pit Ryan Park 2008 Entry	DM	9/8/08	Special Use Authorizations
Mainline Trail Extension	DM	7/8/08	Special Use Authorizations
Laramie Ranger District (LRD):			
Laramie District Precommercial Thinning Analysis - 2008	DM	5/1/08	Fuels / Vegetation Management
North Fork Allotment Management Plan	DN	9/30/08	Grazing Management
Douglas Ranger District (DRD) - Laramie Peak Unit			
No decisions were made for the Laramie Peak Unit in FY2008			

Table 3. Routt NF projects completed in FY08.

Name	Decision Type	Date Signed	Primary Purpose
Hahns Peak-Bears Ears District (HPBE):			
Larson II Timber Sale and Fuels Reduction (was Red Creek Fuel Reduction)	DN	11/1/07	Fuels Management / Forest Products
California Park Sharp-tailed Grouse Habitat Restoration Project	DM	9/4/08	Wildlife Habitat Improvement
Del's Triangle Three OG Permit	DM	9/23/08	Special Use Authorization
Dutch Creek Guest Ranch OG Permit	DM	9/23/08	Special Use Authorization
Farwell Mountain Communication Site	DM	5/6/08	Special Use Authorization
Hahns Peak Water Coalition Water Tank Installation	DM	9/4/08	Special Use Authorization
High Mountain Snowmobile Permit Renewal	DM	12/14/07	Special Use Authorization
Home Ranch OG Permit	DM	9/23/08	Special Use Authorization
Pearl Lake Dam Repair	DM	7/22/08	Special Use Authorization
Rabbit Ears/Muddy Pass Communication Site	DM	10/17/07	Special Use Authorization
Sensis Corporation/FAA Communication Site - Mount Werner	DM	7/15/08	Special Use Authorization
State of Colorado Communication Site @ Buffalo Pass	DM	8/19/08	Special Use Authorization
Steamboat Lake Outfitters Permit Renewal	DM	9/23/08	Special Use Authorization
Steamboat Powder Cats	DM	12/14/08	Special Use Authorization
Steamboat Ski Touring Center OG Permit	DM	1/7/08	Special Use Authorization
Yampa Valley Electric Underground Powerline	DM	4/28/08	Special Use Authorization
Steamboat Snowmobile Tours	DM	12/14/07	Special Use Authorization
Parks Ranger District:			
Grouse Mountain Fuels	DN	4/7/08	Fuels Management
Owl Mountain North	DN	9/11/08	Fuels Management / Forest Products
Big Creek Fuels	DM	9/11/08	Fuels Management / Forest Products
McKinnon Draw Electric Fence	DM	9/8/08	Grazing Management
Pleasant Valley Ditch	DM	11/20/07	Special Use Authorization
Mountain Parks Electric Buried Powerline - Allard Property	DM	3/28/08	Special Use Authorization
NE Sierra Madre Hillclimb Watershed Improvement	DM	5/14/08	Watershed Management
Newcomb Creek Trail Reconstruction	DM	9/23/08	Watershed / Recreation Management
Rocky Mountain Elk Foundation Access Permit	DM	3/3/08	Special Use Authorization

Name	Decision Type	Date Signed	Primary Purpose
Snyder Creek Loop Reroute	DM	1/7/08	Recreation management
Troublesome Basin Trail #51	DM	9/22/08	Watershed / Recreation Management
Yampa Ranger District:			
Coal Creek Fish Barrier	DN	9/18/08	Fish Habitat Improvement
Forest-wide Weed Treatment EA	DN	12/11/07	Noxious Weed Management
Williams Fork Allotment Management Plan	DN	7/24/08	Grazing Management
Challenge Outfitters Permit Renewal	DM	5/27/08	Special Use Authorization
Latigo Ranch Permit Renewal	DM	3/3/08	Special Use Authorization
Temporary Outfitter Guide Permit Renewals	DM	5/27/08	Special Use Authorization
Tailwind Tours Mountain Bike Rides	DM	5/27/08	Special Use Authorization
Yampa Ranger District Wind Turbine	DM	7/17/08	Facility Improvements

During the period spanning October 1, 2003 to Sept. 30 2008, 216 decisions were signed relating to the Medicine Bow and Routt National Forests. These decisions are summarized in Table 4.

Table 4. Decisions completed during FY04 through FY08.

District	ROD	DN	DM	Total
Decisions on more than one unit		2	1	3
Medicine Bow NF				
BCH	2	10	42	54
LRD	0	5	23	28
DRD(Laramie Peak)	0	1	6	7
Routt NF				
HPBE		9	60	69
Parks		5	23	28
Yampa	1	7	19	27

Monitoring items

The National Forest Management Act (NFMA) identifies specific legally required monitoring items for forest plan implementation as well as additional monitoring that is conducted based on the availability of funding and personnel. The discussion and results of the monitoring items are given below.

Ensure Sustainable Ecosystems

Watershed Condition

Medicine Bow Objective 1.a.1
Routt Monitoring Item 1-3
Reporting Period: 5 year

These monitoring items ask the questions:

To what extent has watershed condition been maintained or improved?

How well are management activities maintaining watersheds in a healthy condition?

Monitoring Protocol/Data Collected

There are no direct measures of watershed condition. This assessment relies upon a commonly used process in the Forest Service of estimating the vulnerability of a watershed to management activities and the magnitude and intensity of management activities in a watershed. The resulting watershed condition class provides a relative indication of the physical, chemical and biotic conditions of watersheds across the Forest. This watershed condition assessment utilizes existing, readily available sources of data and professional judgment, which are believed to provide a sufficient broad scale indication of watershed conditions across the Forest. A detailed description of the methods and assumptions used for this Watershed Condition Assessment is available (Schnackenberg et al 2009).

The following definitions are provided and used for this watershed condition assessment (FSM 2521.1):

Watershed Condition. The state of a watershed based upon physical and biological characteristics and processes affecting hydrologic and soil functions.

Class I Condition. Watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. The drainage network is generally stable. Physical, chemical, and biologic conditions suggest that soil, aquatic, and riparian systems are predominantly functional in terms of supporting beneficial uses.

Class II Condition. Watersheds exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. Portions of the watershed may exhibit an unstable drainage network. Physical, chemical, and biologic conditions suggest that soil, aquatic, and riparian systems are at risk in being able to support beneficial uses.

Class III Condition. Watersheds exhibit low geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. A majority of the drainage network may be unstable. Physical, chemical, and biologic conditions suggest that soil, riparian, and aquatic systems do not support beneficial uses.

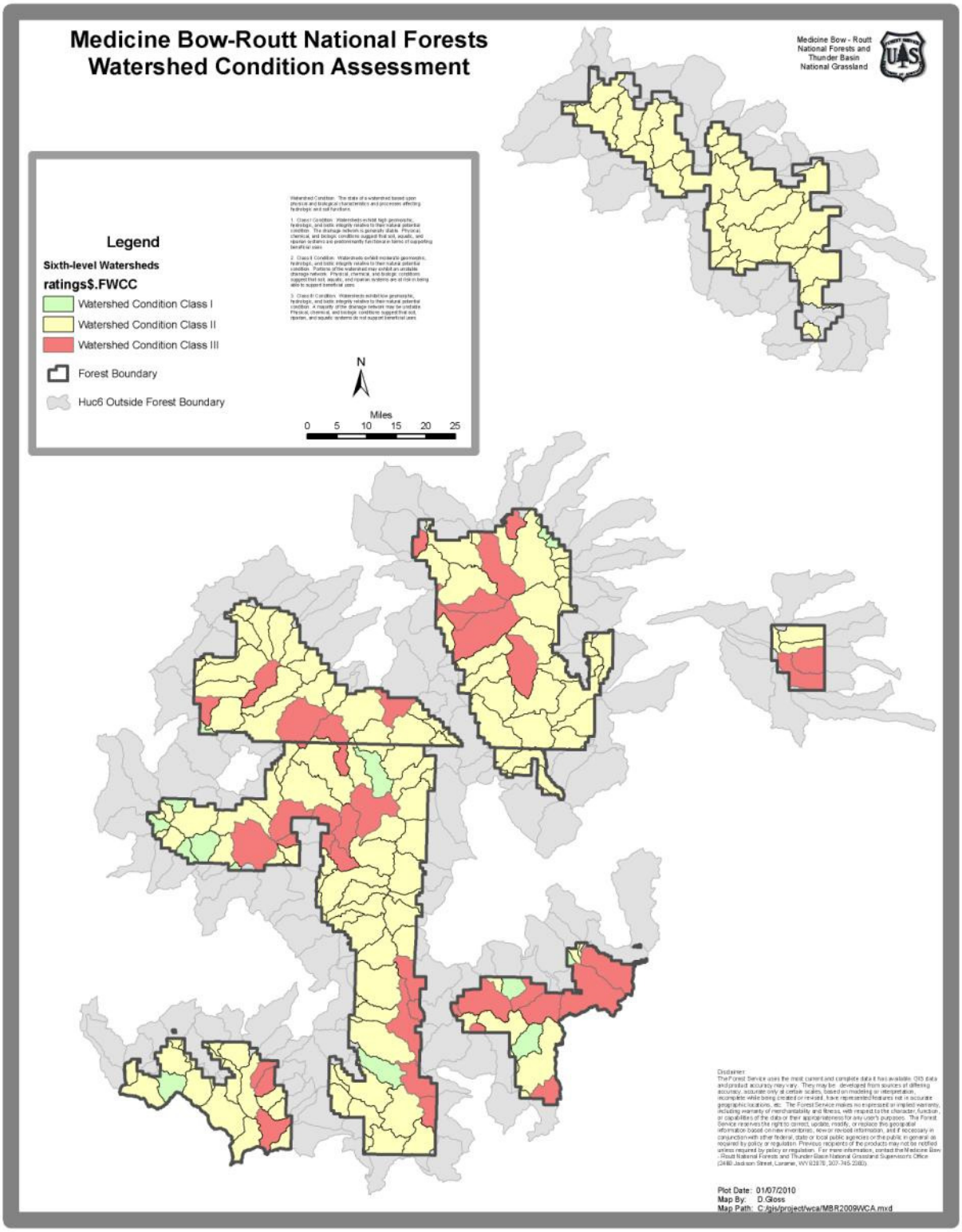


Figure 1. Watershed condition classes from 2009 Watershed Condition Assessment.

Results/Evaluation

Table 5 and Figure 1 summarize the current watershed condition classes for sixth-level watersheds on the forests. Results indicate the majority of the watersheds on the MBR have been changed from their natural potential condition in terms of physical, biotic and/or chemical conditions to a moderate degree with 143 of the forests' watersheds rated as watershed condition class II. There are 35 watersheds rated as class III and 14 of the watersheds rated as class I. Due to changes in assessment methods/objectives and watershed boundary changes, the results of this Watershed Condition Assessment cannot be directly compared to watershed condition assessments conducted when the forest plans were revised.

Table 5. Watershed Condition Classes on the Medicine Bow- Routt NFs.

Watershed Condition Class	Number of Watersheds in Class	Assessment Area (sq mi)	Assessment Area (%)
Class I (Functional)	14	155	4
Class II (At Risk)	143	3,079	75
Class III (Non-functional)	35	891	21
Totals:	192	4,125	100

The following conclusions can be drawn from this assessment:

- Overall watershed conditions on the two forests have changed very little as a result of management activities on the Forest, with the following site-specific exceptions:
    - Significant degradation of water quality and aquatic habitat in Soldier and Pinkham Creeks after a permitted irrigation ditch breached.
    - Fires and blowdown have influenced watershed conditions on portions of the Laramie Range, southern Snowy Range, and northern Parks Range, but there has been no known significant degradation of water quality or aquatic habitat in these watersheds.
- As a result of tree mortality due to the mountain pine beetle epidemic, effects described by Carlson (2008) related to water yield (hydrologic function), riparian areas, sediment production (sediment control), soil quality and water purity can be expected in many of the watersheds across the forests. Effects vary by watershed, but are expected to be directly related to the amount of tree mortality in a watershed.
- Due to the cumulative effects of past management activities and recent fire, blowdown and primarily simulated levels of tree mortality due to the pine beetle epidemic, approximately 1/3 of the watersheds on the two forests can be expected to see measurable increases in runoff and streamflow. In some cases this may result in degraded stream health as a result of the beetle epidemic.

Recommendations

- Complete a forestwide assessment of the watersheds which are most at risk of adverse effects to aquatic systems, public water supplies, and other infrastructure due to large scale fire.

- Expand efforts to track soil, watershed and fisheries improvement projects over time by sixth-level watershed. Currently data is reported in the annual monitoring report, but is not easy to summarize spatially over longer periods of time.

Riparian and Wetland Conditions

Medicine Bow Objective 1.a.3
Routt Monitoring Item 1-9
Reporting Period: 5 year

These monitoring items ask the questions:

To what extent are riparian and wetland areas meeting proper functioning condition?

How are management activities affecting riparian habitats (including wetlands) on the forest?

Forest Plan Goals, Objectives, and Standards: The most pertinent direction from the Medicine Bow and Routt Forest Plans is listed below. Additional direction can be found within the Forest Plans and Watershed Conservation Practices (WCP) Handbook (FSH 2509.25).

Medicine Bow Subgoal 1.a, Objective 3: Over the life of the plan, maintain or improve condition of riparian or wetland habitat on the Forest. Ensure at least 80% of riparian and wetland areas will meet or move toward proper functioning condition.

Forest Plan Standards: Water and Aquatic Standard 4: In the water influence zone next to perennial and intermittent streams, lakes, and wetlands, allow only those land treatments that maintain or improve long-term stream health.

Monitoring Protocol/Data Collected

Primary assessment techniques used include Proper Functioning Condition (PFC) (BLM, 1998), Stream Channel Reference Sites (Harrelson, et al, 1994), and Rangeland Analysis and Management (USDA Forest Service, 1996). Most of these are implemented on rangeland sites susceptible to impacts for livestock, although they may also include timbered areas. Other qualitative methods used include permanent photo points. The vast majority of riparian and wetland condition information is collected during project level planning and monitoring to address the potential effects of management activities on these unique resources. Quantitative methods such as greenline surveys and riparian cross-sections (Winward, 2000) are used when specific concern areas are identified, or to track trend over time.

Wetlands are included in the riparian monitoring since these complexes often occur in or adjacent to riparian complexes. The Watershed Conservation Practices (WCP) Handbook (FSH 2509.25), which provides direction for most of the riparian and wetland Forest Plan Standards and Guidelines, provides specific measures to protect wetlands. In general, management activities have little effect on wetlands. Projects are planned and designed to avoid impacts to wetlands. Any impacts to wetlands that have occurred are generally from past management practices before protection measures were in place.

PFC is an interagency protocol developed to provide a consistent approach for considering hydrology, vegetation and erosion/deposition (soils) attributes and processes to assess the condition of riparian-wetland areas. The functioning condition of riparian-wetland areas is a result of interaction among geology, soil, water, and vegetation (FSH 2509.25). The on-the-

ground condition termed PFC refers to how well the physical processes are functioning, and is a qualitative assessment based on quantitative science (BLM, 1998).

Results/Evaluation

2008 Monitoring results:
The Forests completed approximately 35 miles of stream and riparian condition assessment during 2008 using a variety of inventory and monitoring methods. Stream and riparian condition inventories completed on the forests have been summarized annually in the Forest Monitoring and Evaluation Reports (USDA Forest Service 2006; USDA Forest Service 2007; USDA Forest Service 2008). Since 2005 the forests have completed stream and riparian condition inventories on 130 miles of streams (3.6% of the total 3,567 miles of perennial streams on the two forests).

Field reconnaissance found that the effects of timber management and road construction are primarily from past activities, and that current timber and road construction activities are not affecting riparian habitats. Poorly located roads and trails, particularly those which are user built, are impacting isolated riparian areas. When working on projects across the forest, these areas are identified for watershed improvement, fisheries, or other projects that would improve riparian condition. Visual and photo monitoring of recently completed projects indicates that riparian conditions are improving.

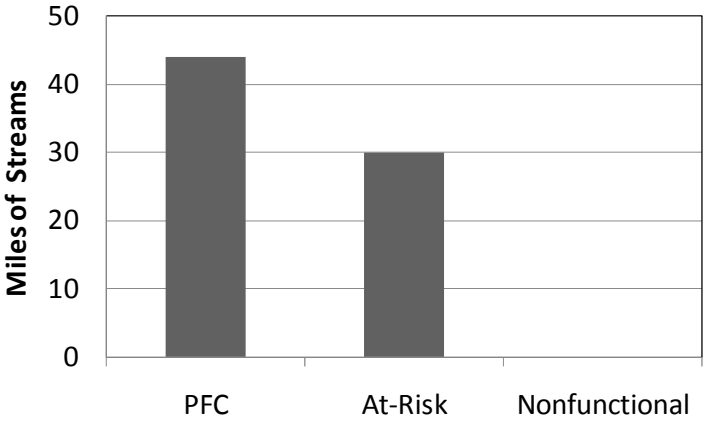


Figure 2. PFC survey results.

MBNF 5 Year and Routt 10 Year Results
Proper functioning condition (PFC) surveys (see Figure 2) over the life of the revised Routt and Medicine Bow Forest Plans found that of 44 miles surveyed, 30 miles (68%) were in proper functioning condition (PFC), and 14 (32%) miles were rated functional at risk (BLM, 1998). No streams were rated as nonfunctional.

Streams rated in proper functioning condition have adequate vegetation and land form to dissipate stream energy associated with high waterflows, filter sediment, capture bedload, and aid in floodplain development; improve flood water retention and ground-water recharge; have root masses that stabilize streambanks, develop diverse ponding characteristics that are beneficial to aquatic and terrestrial species, and support greater biodiversity (BLM, 1998). Riparian areas rated as functional at risk can be in a functional condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation (BLM, 1998), at high flow events. These results indicate that approximately two-thirds of surveyed riparian areas are being maintained in a suitable state, while one-third is in need of improvement. However, these results reflect some bias as riparian areas in good condition are often not assessed as there is not a need to identify specific concerns.

Lower First Creek and Elkhead Creek on the Hahns Peak-Bears Ears District were intensively monitored from 2006-2008 consistent with the decision notice for the California Park

allotments. This monitoring found that impacts from ungulate grazing were high throughout the entire grazing season, and that wildlife (primarily elk) had extensive impacts in June, prior to livestock grazing. These impacts include both bank trampling and browsing of woody species regeneration (willows). Stubble height measurements indicated that Routt range guideline 2 regarding stubble height was being met, but that bank trampling was not meeting guidance established in the California Park range allotment analysis. Of three reaches monitored, the degree of impact would vary throughout the year with some reaches being most impacted prior to livestock grazing, while other reaches showed the greatest impact during the middle or end of the livestock grazing season. This supports the conclusion that both wildlife and livestock are affecting riparian conditions on these streams.

Conclusions

Of reaches assessed through the PFC methodology, two-thirds of riparian areas are meeting the two forest plans' monitoring objective of PFC, while one-third are rated functional at risk (see Figure 2). This indicates a need for improved riparian conditions to meet forest plan goals and objectives of 80% of reaches meeting or moving toward proper functioning condition.

Qualitative assessments indicate that current timber management and road construction is generally not significantly affecting riparian and wetland condition. Project planning locates these activities away from wetlands or riparian areas except for isolated locations where roads must cross streams and/or riparian areas/wetlands to meet the purpose and need for the project. Past effects of poor road location and timber harvest are being addressed through soil, water, and fisheries improvement projects.

Much of the degradation to riparian areas and wetlands observed in recent years across the forests is a result of illegal motorized vehicle use in riparian areas and wetlands. Many of these impacts are observed and restoration efforts are taken, but many impacts are likely not observed and no restoration has taken place. There has been no effort to quantify and track these impacts. Continued emphasis on travel management, use of the recently created Motor Vehicle Use Maps, and an active restoration program are necessary to ensure properly functioning riparian and wetland conditions on the Forest.

Effects to riparian habitats come from regulated activities such as livestock grazing, as well as unregulated activities such as wildlife grazing. Ungulate grazing has the highest potential to affect riparian condition and stream stability through bank trampling and impacts to streambank stabilizing riparian vegetation, and alteration of the composition of riparian vegetation both on the streambanks and across the riparian area. This was most evident in the last three years of monitoring in California Park where monitoring was conducted prior to livestock grazing, as well as while livestock where on the allotment, and following removal of livestock from the allotment. This monitoring found that both elk and livestock were affecting riparian condition. The lack of control over wildlife grazing may complicate attainment of forest plan objectives.

Recommendations

Forest Plan Goals and Objectives: This analysis did not identify the need to change any of the Forest Goals or Objectives for the soil, water, or aquatic resources in either the Medicine Bow or Routt Forest Plans.

Forest Plan Standards and Guidelines: This analysis did not identify the need to change any of the Standards or Guidelines for the soil, water, or aquatic resources in either the Medicine Bow or Routt Forest Plans.

This analysis identified the following recommendations for maintaining and improving riparian and wetland conditions across the Forest:

- Continue to conduct stream and riparian condition inventories at the project level and summarize annually.
- Incorporate greenline transects or other quantitative monitoring methods where PFC assessment surveys indicate a degraded riparian condition
- Maintain and annually update the Forestwide Proper Functioning Condition database developed in 2009.
- PFC assessments should address all reaches considered susceptible to livestock grazing during project level range analysis to present an unbiased sample of reaches in proper functioning condition, as well as those that are functional at risk.
- Continued emphasis on travel management, use of the recently created Motor Vehicle Use Maps, and an active restoration program are necessary to ensure properly functioning riparian and wetland conditions on the Forest.
- Develop a Forestwide system to track the acquisition and disposal of wetlands across the Forest to ensure compliance with Executive Order 11990 Protection of Wetlands.

Stream flows

Medicine Bow Objective 1.a.4
Reporting Period: 5 year

This monitoring item asks the question:

To what extent have stream flows been protected or enhanced?

Monitoring Protocol/Data Collected

Section 505 of the Forest Land Policy Management Act (FLPMA), Medicine Bow and Routt Forest Plan Standard 8, and the Region 2 Watershed Conservation Practices Handbook (WCP) Management Measure 7 all direct that streamflows be managed under appropriate authorities to minimize damage to scenic and aesthetic values, fish and wildlife habitat, and otherwise protect the environment. Streamflows can be protected through; 1) administrative or regulatory authority such as placing conditions on land use authorizations for water developments (easements or special use permits), or 2) Federal or State ownership of instream flow water rights.

Results/Evaluation

Evaluation of this question found minimal protection of stream flows, particularly in instances where the Forest Service has administrative or regulatory authority.

Administrative/Regulatory Authority: The Forest has 310 land use authorizations for water facilities (DOI easements, ditch bill etc) on the Forest; 62 of these are for reservoirs and dams, with the remaining 248 for ditches, pipelines, wells, or spring developments. Of these

310 authorizations, three (1%) include some measure to protect or enhance streamflows on 22 streams, and 11 (3.5%) include some measure to protect lake levels on 11 lakes or reservoirs.

Water facilities with conditions to protect streamflows included in land use authorizations on the Forest have been monitored during this Forest Planning cycle (e.g. USFS 2004; USFS 2006; USFS 2007; USFS 2008). Results indicate that streamflow protection conditions in the land use authorizations are being achieved on most streams and lakes. While the effectiveness of the existing conditions has not been evaluated, overall implementation of the permit conditions appears to be successful in the limited number of permits on the Forest that contain measures to protect streamflow.

Instream flow water rights: The Forest has not claimed or obtained any Federal instream flow water rights under the Organic Act or any Multiple-Use Sustained-Yield Act purposes.

Within Colorado, the only entity that can hold an instream flow water right is the Colorado Water Conservation Board (CWCB); the Forest Service or other entities are not allowed to hold an instream flow water right at this time. The CWCB holds extensive water rights within the Routt National Forest with 170 instream flow water rights on 660 miles of perennial stream[1]; this equates to approximately 34% of the perennial stream miles on the RNF.

Within Wyoming, the only entity that can hold an instream flow water permit is the Wyoming Water Development Commission (WWDC). The WWDC holds instream flow water permits within the Medicine Bow National Forest with 24 instream flow water permits on 95 miles of perennial stream; this equates to approximately 6% of the total perennial stream miles on the MBNF.

While state instream flow protection programs provide some level of protection, cursory review of these water rights/permits found that they provide only the minimum flow needed to maintain basic aquatic life. However, these flows are not sufficient to maintain ecological processes including channel maintenance flows that help to maintain the diversity of aquatic habitats, transport the sediment and bedload naturally supplied to the stream system, maintain channel capacity to transport flood flows, and maintain groundwater recharge to adjacent floodplains and riparian/wetland areas. Much of the state instream flow protection is also junior to existing water rights. State instream flow protection programs are under the jurisdiction of the State legislatures.

Conclusion: The forests have utilized regulatory authority to provide stream flow protection on a small percentage (1.0%) of water facility land use authorizations on streams across the Forest. The forests have not claimed or obtained any federal instream flow water rights under the Organic Act or any Multiple-Use Sustained-Yield Act purposes. State instream flow programs provide some level of streamflow protection on approximately 21% of the perennial streams across the forests. While some existing streamflow protection is in place on the forest, further evaluation is necessary to determine if the existing protection is sufficient to meet the intent of Sec 505 of FLPMA, the Medicine Bow or Routt forest plans, and the WCP.

[1] Perennial stream miles were determined based on perennial stream delineations on USGS Topographic maps

Recommendations

Where possible, future re-issuance of existing and new water facility authorizations should ensure stream flow protection consistent with FLPMA sec 505, other federal and state laws, the Medicine Bow and Routt forest plans, and Forest Service Handbook Direction.

In order to better respond to reissuance of authorizations as well as requests for new water developments, there is a need to develop a comprehensive strategy to address streamflows while still recognizing the need for additional consumptive uses of water.

> **Proposed Strategy**: Development of this strategy over the next two years would position the Forest to respond to water development proposals in a consistent manner. Without such a strategy, each stream reach/watershed is evaluated individually without a forest context. While this strategy will identify where additional water development would significantly affect high value resources, it should also identify areas where there is potential to accommodate water developments to meet consumptive use needs. Stream reaches identified for possible water developments would still incorporate site specific design criteria or mitigation measures identified through the project planning stage to meet the desired condition for that stream segment.

Soil Productivity

Routt Monitoring Item 1-1
Medicine Bow Item Subgoal 1.a 36CFR219.12(k)(2)
Frequency of Measurement: Annual
Reporting Period: Annual

This monitoring item asks the question:

Are long-term soil health and productivity being maintained?

Monitoring Protocol/Data Collected

Forest Service Handbook 2509.18 Soil Management Handbook R2 Supplement No. 2509.18-92-1 Chapter 2 - Soil Quality Monitoring indicates that soil productivity is the inherent capacity of a soil to support the growth of specified plants, plant communities, or a sequence of plant communities to support multiple land uses.

Maintenance of productivity of the land and the protection and, where appropriate, improvement of the quality of the soil and water resources requires that detrimental changes in soil properties (physical, chemical, or biological) that result in the loss of the inherent ecological capacity or hydrologic function of the soil resource that lasts beyond the scope, scale, or duration of the project causing the change or a silvicultural rotation or land management planning period must be avoided and has far-reaching implications for watershed management in the National Forest System.

Based on available research and current technology, a guideline of 15 percent reduction in inherent soil productivity potential will be used as a basis for setting threshold values for measurable or observable soil properties or conditions. No more than 15 percent of an activity area will be left in a detrimentally compacted, displaced, puddled, severely burned,

and/or eroded condition. The threshold values, along with areal extent limits, will serve as an early warning signal of reduced productive capacity.

This item is assessed using field observations of soil characteristics that indicate detrimental conditions related to soil productivity and health.

Results/Evaluation

Soil Quality Monitoring (Medicine Bow and Routt NFs)
In years 2004-08, six timber sales, two range allotments, one dispersed campsite were monitored to evaluate the effects of these activities on soil health and productivity across the Forest.

All evaluations indicate that these management activities are not having a detrimental impact on soil health and productivity.

All evaluated timber sale units were under the soils standard of limiting detrimentally disturbed soil to no more than 15% of an activity area, which is included in both forest plans. All but one unit met this standard. The one unit that exceeded the threshold of 15% detrimental soil disturbance rehabilitated to meet the forest plan soil standard. It was determined that in the future when the soil type found in this unit, is found in other projects, it will require design criteria which limits soil compaction.

Both evaluated range allotments met Region 2 soil quality standards (FSH 2509.18-92-1) for ground cover and the forest plan 15% detrimental soil disturbance standard.

The dispersed campsite met Region 2 Soil Quality Standards for ground cover. Rehabilitation measures, seeding and ripping of soil compaction, were effective in meeting the standard.

In 2007, soil quality field evaluations representing 502 unique observations of soil conditions were recorded. Observations are classified in the following soil condition categories:

Satisfactory - Indicators signify that soil quality is being sustained and soil is functioning properly and normally. The ability of soil to maintain resource values and sustain outputs is high.

Impaired - Indicators signify a reduction in soil quality. The ability of soil to function properly has been reduced and/or there exists an increased vulnerability to exceed detrimental soil quality standards. An impaired category signals land managers that there is a need for further investigation of the activity area to determine causes and degrees of decline in soil quality. This impaired condition can be a result of inherent and natural site conditions such as: steep slopes, aspects, parent material or past activities. Changes in management practices or other preventative actions might be appropriate.

Unsatisfactory - Indicators signify that loss of soil quality has occurred and soil condition has been detrimentally impacted according to Region 2 soil quality standards. Soils rated in the unsatisfactory category are candidates for improved management practices or restoration designed to recover soil quality. Detrimental soil impacts result in the inability of soil to maintain resource values, sustain outputs, and recover from impacts.

Conclusions

- Monitoring during 2008 indicates that long-term soil health and productivity is being maintained. Site-specific monitoring data is on file with the Forest Soil Scientist.
- Soil quality field evaluation protocol continues to prove effective as a monitoring tool.

Recommendations

- Continue to develop the comprehensive soil quality monitoring strategy utilizing the new soil quality field evaluation protocol.

Air Quality

Routt Monitoring Item 1-2
Reporting Period: Annual

This monitoring item asks the question:

Are management activities maintaining or improving air quality including the Mount Zirkel Wilderness?

Monitoring Protocol/ Data Collected

There are two air-quality monitoring sites located in the Routt National Forest near the southern boundary of the Mount Zirkel Wilderness Area: Buffalo Pass, Dry Lake (CO93) and Buffalo Pass, Summit Lake (CO97). Both monitoring sites are part of the National Atmospheric Deposition Program (NADP) and are components of the National Trend Network (NTN). Each site monitors precipitation (rain and snow); data are collected from the sites four times per month for each month of the year. Atmospheric metrics (mg/L) collected at both sites are: Ca, Mg, K, Na, NH4, NO3, Cl, SO4, PO4, conductivity (µSiemens/cm), and pH. Additionally, CO97 is part of the Mercury Deposition Network (MDN) and collects data about atmospheric mercury concentrations (ng/L) and deposition (ng/m^2). The Buffalo Pass, Dry Lake site has continuously collected data since 14 October 1986. The Buffalo Pass, Summit Lake site has continuously collected data since 2 July 1984. All data are analyzed by Central Analytical Laboratory, Illinois State Water Survey, University of Illinois, Urbana-Champaign.

Results/Evaluation

Data from both sites are publicly available on the following website:

http://nadp.sws.uiuc.edu/sites/siteinfo.asp?net=NTN&id=CO93;

Substitute CO97 at the end of the URL to access data from the Buffalo Pass, Summit Lake site. Overall, the data indicate that the Class 1 Airshed in the vicinity of the Mount Zirkel Wilderness has been in compliance with state and federal air-quality standards from 2004 to 2008. Consequently, Forestwide standards and guidelines have been met during the second five-year interval (2004-2008) of the 10-year reporting period.

Recommendations

Continue to collect atmospheric-precipitation data from CO93 and CO97. In addition, continue to implement prescribed-fire treatments within prescription and take other management actions to reduce combustion products (i.e. slash burning) and dust due to multiple-use management activities.

Water Quality

Routt Monitoring Item 1-3
Medicine Bow Objective 1.a.2
Frequency of Measurement: Annual
Reporting Period: Annual

This monitoring item asks the question:

Are management activities meeting state water quality standards and to what extent has water quality been restored, maintained or improved?

Forest Plan Goals, Objectives, and Standards

The most pertinent direction from the Medicine Bow and Routt forest plans is listed below. Additional direction can be found within the forest plans and Watershed Conservation Practices (WCP) Handbook (FSH 2509.25).

Forest Plan Goals and Objectives:

- *Medicine Bow Subgoal 1.a: Improve and protect watershed conditions to provide the water quality and quantity and soil productivity necessary to support ecological functions and intended beneficial uses.*
    - *Objective 2: Over the life of the plan, maintain or improve water quality by achieving an 80% reduction in the miles of State of Wyoming designated streams not fully supporting designated beneficial uses and by maintaining existing fully supporting designated beneficial uses in all streams, lakes, reservoirs and open water bodies.*
- *Routt Goal 1, Objective 3: Improve water quality, channel stability, and aquatic habitat in areas not meeting State water quality standards and in watersheds of concern and meet the anti-degradation clause of the Clean Water Act across the Forest.*

Forest Plan Standards: All of the soil, and water and aquatic standards are relevant to this monitoring item.

Monitoring Protocol/Data Collected

Water quality data on the Forest are collected by various Federal, State and local governments as well as non-governmental entities and individuals. The states of Colorado and Wyoming produce biennial comprehensive summaries of water quality conditions in each state. A summary of the status of water quality across the forests can be found in Table 6. Streams with water quality problems that are affecting designated beneficial uses are listed in Table 7.

Water quality is restored, maintained, or improved, largely through soil and water improvement projects, and stream and lake enhancement projects. Implementation of these projects focuses largely on reducing sedimentation to streams and lakes to protect the State designated beneficial use of aquatic life. Some projects also help to protect water quality by reducing input of pathogens such as E.Coli, or inorganic compounds such as metals. Cooperative watershed plans with conservation districts and state agencies provide a strategic approach to maintaining and improving water quality, usually with a focus on streams where specific water quality concerns have been identified.

Results/Evaluation

2008 Status of Water Quality

Most surface waters on the Forests are believed to be meeting all designated water quality uses, but due to the sampling requirements only a small subset of the waters have recent comprehensive data to support this conclusion (Table 6).

Table 6. 2008 Summary of forest water quality assessments for Colorado and Wyoming

Water Body Name	Reach	Determination	Source
North Platte River Basin - Wyoming			
South Fork Little Laramie River	WYNP10180010-664	Fully supports all designated uses.	WYDEQ, 2004
Middle Fork Mill Creek	WYNP10180010	Fully supports all designated uses.	WYDEQ, 2004
Miller Lake	WYNP10180010	Fully supports all designated uses, except insufficient data to determine if fish consumption and contact recreation uses are supported.	WYDEQ, 2006
Hanging Lake	WYNP10180010	Fully supports all designated uses, except insufficient data to determine if fish consumption and contact recreation uses are supported.	WYDEQ, 2006
South Fork Hog Park Creek	WYNP10180002	Fully supports all designated uses.	WYDEQ, 2004
Smith North Creek	WYNP10180002-666	Fully supports all designated uses.	WYDEQ, 2004
Encampment River	WYNP10180002-086	Fully supports all designated uses, except insufficient data to determine if contact recreation uses are supported.	WYDEQ, 2008
North Platte River Basin-- Colorado			
North Platte Tributaries within wilderness areas (except South Fork Big Creek)	COUCNP01	Fully supports all designated uses	CDPHE, 2003
South Fork Big Creek	COUCNP01	Fully supports aquatic life	CDPHE, 2003
Encampment River	COUCNP02	Fully supports all designated uses	CDPHE, 2003
North Platte River— Camp Creek to Colo/Wyo border	COUCNP03	Fully supports all designated uses	CDPHE, 2003
North Platte River-- Tributaries above Camp Creek	COUCNP04	Fully supports all designated uses	CDPHE, 2003
Illinois River	COUCNP04	Not fully supporting aquatic life	CDPHE, 2003
North Platte River-- Tributaries Camp Creek to Colo/Wyo border	COUCNP04	Fully supports all designated uses	CDPHE, 2003
Michigan River	COUCNP05a	Fully supports all designated uses	CDPHE, 2003

Water Body Name	Reach	Determination	Source
Yampa River Basin-- Colorado			
Tributaries to Yampa River—Flattops Wilderness down to Elk River	COUCYA03	Fully supports all designated uses	CDPHE, 2003
East Fork Williams Fork in Flattops Wilderness	COLCLY08	Fully supports all designated uses	CDPHE, 2001
East Fork Williams Fork River	COLCLY09	Not assessed	CDPHE, 2001
Tributaries to Yampa River—in National Forest	COUCYA20	Fully supports all designated uses	CDPHE, 2003; 2006
Elk River—mainstem and tributaries	COUCYA08	Fully supports all designated uses	CDPHE, 2003
Little Snake River Basin-- Colorado			
Slater Creek	COLCLY08	Fully supports all designated uses	CDPHE, 2001
Little Snake River Tributaries	COUCYA19	Fully supports all designated uses (except where noted in Table 3).	CDPHE, 2003

Most water quality monitoring has been conducted on streams where designated uses are known or suspected to be impaired; limited monitoring has occurred on streams likely to meet all designated uses. Table 7 and Figure 3 show the water bodies on the forests that have been determined by the States of Colorado and Wyoming to have water quality concerns.

Table 7. 2008 Forest Water Quality Impairments for Colorado and Wyoming

Water Body Name	Ranger District	Threatened or Impaired	Year first identified as T or I	Impaired Designated Use	Cause of Impairment
North Platte River Basin - Colorado					
S F Big Creek in Wilderness	Parks	M&E list[2]	2004	Aquatic Life; drinking water	Metals-Cu
Snyder Creek	Parks	M&E list	1998	Aquatic Life	Sediment
Grizzly Cr	Parks	M&E list	2006	Aquatic Life	Unknown
Little Grizzly Cr	Parks	M&E list	2008	Recreation; drinking water	E.Coli; Metals--Fe(Trec)
Lake Cr	Parks	M&E list	2008	Drinking Water; aquatic life	pH; Fe (Trec)

[2]Streams are placed on the Colorado Monitoring and Evaluation List (M&E list) when there is reason to suspect water quality problems, but there is uncertainty regarding one or more factors.

Water Body Name	Ranger District	Threatened or Impaired	Year first identified as T or I	Impaired Designated Use	Cause of Impairment
Illinois River	Parks	303(d) list	2006	Aquatic Life; drinking water	Metals-Fe (trec)
Yampa River Basin – Colorado					
Bushy Creek	Yampa	M&E list	1998	Aquatic Life	Sediment
Lost Dog Creek	HPBE	M&E list	2008	Aquatic Life; Drinking water	Mercury
Little Bear Creek	HPBE	M&E list	2008	Drinking water; aquatic life	Copper; Zinc
First Creek	HPBE	M&E list	1998	Aquatic Life	Sediment
First Creek	HPBE	303(d) list	2006	Recreation 1A	E.coli
Elkhead Creek	HPBE	303(d) list	2006	Recreation 1A	E.coli
Little Snake River Basin - Colorado					
Oliver Creek	HPBE	M&E list	1998	Aquatic Life	Sediment
Slater Creek	HPBE	M&E list	2008	Aquatic Life	Selenium
Little Snake River Basin - Wyoming					
W Fork Battle Creek	BCH	Yes - Impaired	2000	Coldwater fisheries; Aquatic life	Metals
Haggerty Creek	BCH	Yes - Impaired	<1988	Coldwater fisheries; Aquatic life	Metals
South Platte River Basin - Wyoming					
N. Branch N Fork Crow Creek	LRD	Yes - Impaired	2004	Contact Recreation	E.coli

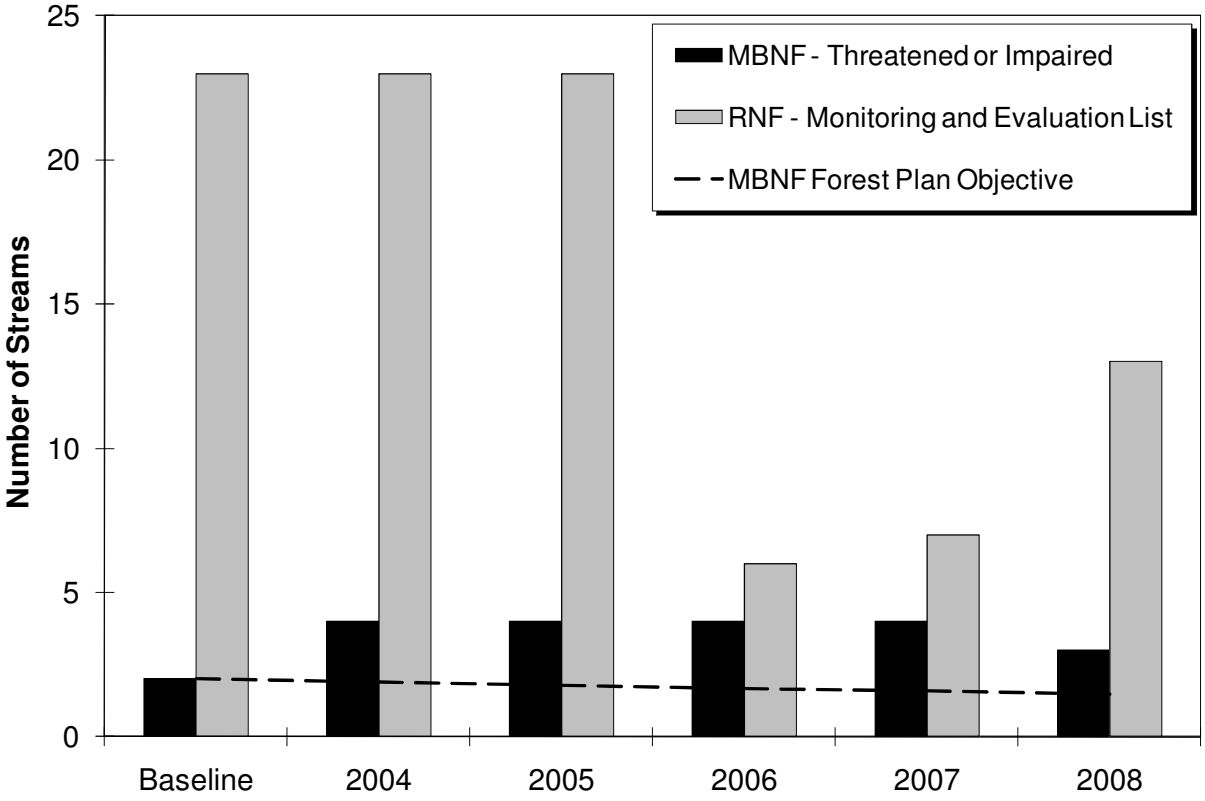


Figure 3. Forest water quality impairments for Colorado and Wyoming

COLORADO

Streams on the Colorado M&E list for sediment:

Data has been collected on the four stream segments on the M&E list for sediment and submitted to the Colorado Water Quality Control Division (WQCD). The WQCD has not yet made a recommendation on these stream segments regarding addition to the 303(d) list or removal from the M&E list.

Streams on the Colorado M&E list and 303(d) list for metals and pH:
The Forest has not been involved in any of the data collection or listing of streams on the M&E list or Illinois River on the 303(d) list for metals. The Forest has requested data from the State regarding listing of these streams. Forest watershed personnel have offered to cooperate with the State on additional data collection to further determine the extent and acuity of these water quality concerns.

Streams on the Colorado M&E or 303(d) list for E.coli:
The Forest initiated monitoring of bacterial concentrations on a few selected streams in response to scoping questions on grazing allotments. A total of seven reaches were sampled during 2003 and 2004. The Forest collected additional samples in 2007 to further characterize E.Coli levels in First Creek and Elkhead Creek in the California Park area, and Little Rock Creek and Big Rock Creek in the Gore Pass area. New sample sites were added on all four streams to further depict the areal extent of potential E.Coli concerns in these streams. All of the 2007 data was sent to the WQCD. Based on this data, the WQCD

recommended removal of Big Rock Creek and Little Rock Creek from the M&E list. This recommendation was approved by the Colorado Water Quality Control Commission in 2008, and these streams have been removed from the M&E list.

To further address the 303(d) listed streams in California Park, the Forest conducted a use attainability analysis (UAA) to determine the current and potential extent of primary recreation occurring on First Creek and Elkhead Creek in California Park. The UAA provides site specific information that demonstrates minimal to no occurrence of primary contact recreation use in these stream segments. In addition, the potential for primary contact use to occur is minimal due to remoteness of the area and access limitations. The Forest submitted a formal proposal for changing the recreation standards in California Park on Elkhead Creek and First Creek from primary recreation to not primary recreation to better reflect the actual recreation use. This proposal was reviewed and approved by the WQCD in June 2008. This change in recreation standards allows the Forest and State to focus resources on pertinent issues regarding the listed stream segments. Additional E.Coli data was collected on First Creek and Elkhead Creek in 2008, and will continue in 2009. This data will be submitted to the State for evaluation and determination if listing of these streams on the 303(d) list is still warranted.

WYOMING

Haggerty Creek and West Fork of Battle Creek
These streams are not fully supporting designated uses due to metals contamination from the historic Ferris-Haggerty mine, which is located on private lands within the Forest boundary. Heavy metal contamination may also be from background levels of metals in this highly mineralized area. On-going WYDEQ monitoring continued in 2008 and is focused on determining the extent of the impairment and the levels of natural metals in the area. WYDEQ developed a TMDL for these streams, but EPA has not fully accepted the TMDL at this time. WYDEQ planned to revise the TMDL in 2008. Since the source of contamination is located in private lands WYDEQ–AML has been the primary entity with the authority for reclamation efforts. The Forest Service plays a minor role in this reclamation effort, but has cooperated with WYDEQ-AML for reclamation facilities and access across NFS lands. Reclamation of exploratory mining conducted in 2007 took place in 2008.

North Branch of the North Fork Crow Creek and Middle Crow Creek
Since 2004, these streams have not met their contact recreation uses due to elevated levels of bacteria. Since Middle Crow Creek had attained the contact recreational use criteria from 2004 to 2007, it was removed from Wyoming's 2008 303(d) List of Waters Requiring Total Maximum Daily Loads. The Laramie County Conservation District worked cooperatively with the Laramie Rivers Conservation District and the Forest Service in 2008 to collect 63 water quality samples (E. coli) at one monitoring station on Middle Crow Creek and two stations on North Branch North Fork Crow Creek. Over half of the calculated geometric means on Middle Crow Creek in 2008 were above the primary recreation use numeric criteria established by the State of Wyoming for E.coli after four years of attaining the standard. North Branch North Fork Crow Creek met numeric criteria for water quality at NFSR 700 during sample periods at the beginning and end of the summer, but did exceed the numeric criteria in June, July and August in 2008. North Branch North Fork Crow Creek exceeded numeric criteria for water quality above NFSR 700 for the majority of the sampling periods from May through September 2008. Best management practices continue to be implemented in these watersheds to address elevated levels of bacteria, but no new practices were implemented during 2008.

Conclusions

The listing of the streams on the Colorado 303(d) list as impaired in 2006 were the first to be listed since the 1997 Routt Forest Plan was signed (Figure 3). In the case of the Illinois River the reason for listing is unclear at this time. For Elkhead Creek and First Creek in California Park, it is uncertain the source of the E.coli that is causing an exceedance of state water quality standards as there are numerous sources in the watershed that contribute to elevated bacterial concentrations including wildlife, livestock, and humans. At this time there is no direct connection between the adequacy of the forest plan for protecting water quality and the 303(d) listings. This does however move the forest away from the Routt Forest Plan goal of 'improve water quality… in areas not meeting State water quality standards… and meet the anti-degradation clause of the Clean Water Act across the Forest (RNF p.1-2).'

With the 2004 listing of two additional streams as impaired, the number of impaired streams on the Medicine Bow National Forest increased from two to four since the Medicine Bow Forest Plan was signed in 2003, but the delisting of Middle Crow Creek reduced the number of impaired streams to three in 2008 (Figure 3). This has moved the Forest away from the objective in the Forest Plan stating "achieve an 80% reduction in the miles of State of Wyoming designated streams not fully supporting designated uses" (Medicine Bow Forest Plan, page 1-2). Monitoring data had shown an improving trend (lower bacteria) on Middle Fork Crow Creek from 2004-07, but elevated levels were seen again in 2008. There continue to be exceedances of numeric water quality criteria on North Branch North Fork Crow Creek, West Fork Battle Creek and Haggerty Creek. The Forest continued cooperative monitoring efforts and implementation of BMPs to address water quality issues in the Crow Creek drainage in 2008.

Water quality restoration and improvement

Watershed, Soil and Fisheries improvement project accomplishments are shown in Table 8 and summarized over time in Figure 4. Acres treated through the soil and watershed improvement program increased annually from 2004 to 2006, decreased in 2007, and was at the highest level in the past five years for 2008. The amount of soil and watershed improvement acres accomplished varies based on the complexity and cost of a project, available funding, and staffing to implement the project. The significant increase in 2008 was due primarily to road decommissioning on Laramie Ranger District with the use of NFS legacy roads and trails funding. The miles of stream restored or enhanced has decreased during the 2004-2006 period, but rose slightly in 2007 and again in 2008. The 2008 increase in accomplishments were primarily due to modification of a waterfall to increase its effectiveness as a non-native trout fish barrier and improvements to stream crossings through road decommissioning. Acres of lakes restored or enhanced have varied over the years, but have remained relatively low in the past five years.

Table 8. 2008 Soil, watershed and fisheries improvement accomplishments

Project	Hydrologic Unit Code*	Ranger District	WSI (acres)	Lake (acres)	Stream Habitat Improved (miles)
NFSR 756.1c road to trail crossing	101800010201	Parks	1	0	0
Illinois River bottomless arch culvert	101800010201	Parks	1	0	0
Snyder Creek trail relocation	101800010201	Parks	1	0	1
Mountain Parks Powerline Reclamation	140100011402	HPBE	2	0	1
Burgess Creek Diversion Structure Removal	140500010406	HPBE	1	0	0
Red Dirt Ghost Rd decommissioning	140100011406	Yampa	16	0	1
Barber Lake - temporary water use	101800100603	LRD	0	1	0
Soldier Summit Road Decomm.	1018000205	BCH	13	0	2
Soldier Summit/N Fk Enc campsites	101800020507	BCH	3	0	1
Eastern Snowy Range Road Decomm.	1018001002	LRD	117	0	14
NFLSR Waterfall Modification	140500030104	BCH	0	0	15
Laramie Peak Unit Travel Mgmt	1018000803	DRD	5	0	1
FY2008 Total			**160**	**1**	**36**

* Hydrologic Unit Code is the watershed numbering system used to identify specific watersheds.

Soil, Water, and Fisheries Improvement Highlights

Burgess Creek Diversion Structure removal: This project was proposed by Mount Werner Water District while working on constructing a water tank on NFS lands. The forest and the water district worked very closely in designing an access road for construction of a water tank for fire mitigation purposes. In order to meet the purpose and need, and the topographic landscape constraints, the road resulted in more ground disturbance. However, Mount Werner Water District was very responsive to these concerns and incorporated all requested design criteria into the road design. During construction, the water district offered to remove an old abandoned diversion structures from Burgess Creek to restore hydrologic function. After consultation with the Army Corps of Engineers, the structure was removed at no additional cost to the forest, and benefited the water and aquatic resources by restoring sediment and bedload transport, and removing a potential fish barrier. The initiation and success of this project was likely due to the positive working relationship established between the forest and Mount Werner Water District during planning and implementation of the road construction/water tank project.

Illinois River Bridge/Culvert replacement: This cooperative project replaced an old wooden stringer bridge with a bottomless arch culvert on a motorized trail that is also groomed for snowmobiles. The old bridge was a safety hazard, and had little freeboard to accommodate flood flows or pass large woody debris. A bottomless arch culvert was used to mimic stream dynamics and maintain aquatic passage while still allowing a full size snow groomer to cross. The forest cooperated with the North Park Snow Snakes (a local snowmobile association) and Jackson County on this project.

Eastern Snowy Range Travel Management – Road decommissioning: Laramie Ranger District completed a comprehensive travel management effort and NEPA decision in 2007. Grant funds and NFS legacy roads and trails funds were received in 2008 and implementation of the road decommissioning portion of the travel management effort was substantial (USDA Forest Service, 2008). A total of 117 miles of unauthorized roads and trails were decommissioned in 2008, which accounts for the large increase in watershed improvement acres for 2008. Treatment methods varied by location, but included signing, fencing, placement of debris, construction of berms, ripping, removal of fill from wetlands and valley bottoms and reconstruction of stream channels.

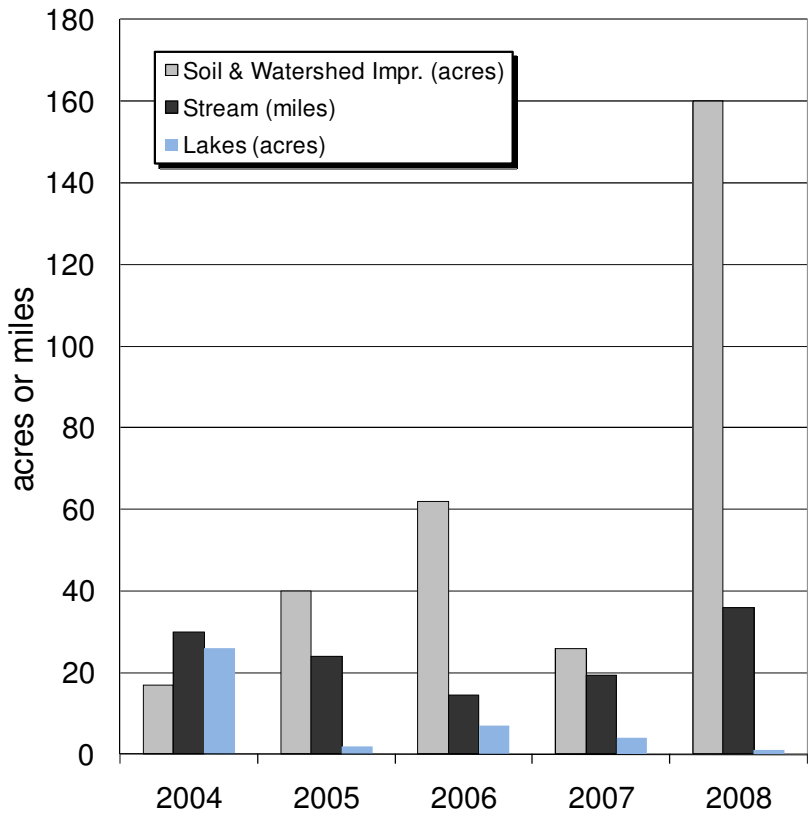


Figure 4. Soil, watershed and fisheries improvement accomplishments 2003-2008

North Fork Little Snake River – Waterfall Modification: The purpose of this project was to protect native Colorado River Cutthroat trout from competition and hybridization from non-native rainbow trout. Modifications to a natural waterfall were completed with the use of explosives to increase the effectiveness (i.e. increase jump height and reduce pool depth below the falls) of the waterfall as a barrier and to prevent upstream movement of non-native trout into habitat occupied by native trout.

Water Rights

During FY08 the Forest focused on two priorities: 1) Updating and correcting range stock water rights, as this is our largest group of water rights, and 2) ensuring that new water rights filed on National Forest System lands follow Forest Service directives. Principle accomplishments for 2008 on the Medicine Bow-Routt National Forests include:

- Entered or updated 310 water rights in NRIS.
- Review 24 monthly resumes for potential new water rights being filed on USFS land by private entities.
- Filed three Statements of Opposition in Colorado
    - Morrison Creek Reservoir—Yampa RD
    - Pierce Water Right—Yampa RD
    - Koelmel Water Right—HPBE RD
- Two letters to proponents regarding conditional water rights filed on USFS lands (Parks and Yampa RD)
- Field inventory of range water improvements (33 Yampa RD; 12 HPBE; 13 BCH; 2 LRD)
- Completed 40 water rights actions (applications, abandonment, statement of beneficial use)
- Continued a temporary water use agreement to secure water for Barber Lake.
- Fifteen ditches with non-Forest Service water rights were inspected, mapped and inventoried on the Medicine Bow-Routt National Forests (7 Parks RD; 1 LRD; 7 BCH).

Recommendations

Forest Plan Goals and Objectives: This analysis did not identify the need to change any of the Forest Goals or Objectives for the soil, water, or aquatic resources in either the Medicine Bow or Routt Forest Plans.

Forest Plan Standards and Guidelines: This analysis did not identify the need to change any of the Standards or Guidelines for the soil, water, or aquatic resources in either the Medicine Bow or Routt Forest Plan.

Forest Level Guidance: This analysis identified the following recommendations to restore, maintain, and improve water quality across the Forest:

- Continue to implement watershed improvement projects that reduce sediment and connected disturbed areas
    - Particular attention should be paid to streams on the Colorado M&E list for sediment.
- Continue to collect E.Coli samples on First Creek and Elkhead Creek to determine if 303(d) listing of these segments is still warranted given the new recreation classifications.
- Monitor compliance with Forest Plan Standards and Guidelines and range BMP implementation on impaired streams or on the M&E list for bacterial impairment.
- Work with the Colorado Water Quality Control Division to obtain water quality data on streams placed on the Monitoring and Evaluation list for metals, pH, E.Coli and aquatic life. Cooperate with the State on additional data collection on these streams.

- Continue to cooperate with Laramie County and Laramie Rivers Conservation Districts on bacteria monitoring and range utilization monitoring in upper Crow Creek watershed.
- Continue adjusting management of grazing and recreational activities to improve water quality in upper Crow Creek.
- Continue to participate in the Watershed Planning effort for the Upper Crow Creek Watershed.
- Conduct a field review with WYDEQ personnel to evaluate if North Branch North Fork Crow Creek should be reclassified from primary to secondary recreation contact designated use.
- Work with WYDEQ to revise the TMDL for Haggerty and West Fork Battle Creeks.
- Continue to analyze each proposed project and recommend Best Management Practices to protect water quality.
- A sample of soil and water mitigation measures undertaken should be monitored during and after implementation to determine the effectiveness for protecting water quality.
    - This monitoring will help determine if there is a need for adjustments to Forest Plan Standards and Guidelines to better protect water quality.

Actions taken on FY07 Recommendations

1. Continue to implement watershed improvement projects that reduce sediment and connected disturbed areas in streams on the M&E list for sediment.

   FY08 Action: The trail reroute on Snyder Creek improved the trail-stream crossing on Snyder Creek and reduced the connected disturbed area.

2. Work with the Colorado WQCD regarding implications of the additional data and UAA; make recommendations at the 2008 Upper Colorado River basin triennial hearing.

   FY08 Action: Formal proposal to change recreation classifications based on UAA approved by Colorado Water Quality Control Commission in June 2008.

3. Monitor compliance with Forest Plan Standards and Guidelines and range BMP implementation on impaired streams or on the M&E list for bacterial impairment.

   FY08 Action: Range BMPs on Elkhead Creek and First Creek monitored prior to, during, and following livestock grazaing.

4. Continue to cooperate with Laramie County and Laramie Rivers Conservation Districts on bacteria monitoring and range utilization monitoring in upper Crow Creek watershed.

   FY08 Action: Sampling strategy was jointly discussed and LCCD collected 63 samples. The USFS conducted range utilization monitoring.

5. Continue adjusting management of grazing and recreational activities to improve water quality in upper Crow Creek.

FY08 Action: Best Management Practices continue to be implemented in these watersheds to address elevated levels of bacteria, but no new practices were implemented during 2008.

6. Continue to participate in the Watershed Planning effort for the Upper Crow Creek Watershed.

   FY08 Action: Forest hydrology and range staff attended the August 19, 2008 Upper Crow Creek Watershed meeting.

7. Submit a petition to WYDEQ to reclassify North Branch North Fork Crow Creek from primary to seconday recreation contact designated use.

   FY08 Action: The Forest worked with LCCD and LRCD to draft an Use Attainability Assessment. A draft was sent to WYDEQ for preliminary review and a field visit is planned for Spring 2009.

8. Implement the strategy finalized in April 2006 for addressing bacteria water quality issues on Range Allotment Management Planning projects.

   FY08 Action: 2006 range strategy to address bacertial water quality incorporated into range project NEPA.

9. Continue to assist WYDEQ-AML with reclamation efforts on Haggerty and West Fork Battle Creeks.

   FY08 Action: WYDEQ-AML did not complete any reclamation during 2008. The Forest provided reclamation suggestions for exploratory mining on private lands.

10. Forest staff should continue to analyze each proposed project and suggest Best Management Practices to protect water quality.

    FY08 Action: Forest staff continued to incorporate Best Management Practices and Design Criteria to protect water quality for all resource planning projects.

11. A sample of the soil and water mitigation measures should be monitored during and after implementation to determine the effectiveness for protecting water quality.

    a. FY08 Action: Ten projects were monitored for BMP implementation and effectiveness for protecting water resources (Schnackenberg et al 2009).

Vegetation Composition and Structure

Medicine Bow Item Objective 1.b.1
Routt Monitoring Item 1-7
Reporting Period: Annual

These monitoring items ask the questions:

To what extent are management actions maintaining and/or restoring composition and structure of the forest and other vegetation

Are forest cover types and habitat structural stages (coarse filter scale as described in the FEIS) being provided for across the Forest?

Monitoring Protocol/Data Collected

Vegetation structure and the predicted changes from the MPB epidemic were analyzed using a GIS Model.

Results/Evaluation

Habitat structure stages (HSS) are used to describe the ecological function of stands based on tree size and canopy cover. These classifications, while estimated from tree size and canopy cover, represent stand components such as tree height, diameter, crown layers and stems of trees, shrub and herbaceous understory, snags and down woody pieces (Thomas et al. 1979). Different arrangements of these components provide different habitats for wildlife (DeVos and Mosby 1971, Edgerton and Thomas 1978). HSS are described in Table 2.

Hoover and Wills (1987) developed HSS classes based on combinations of tree diameter and canopy cover (Table 2). These definitions were incorporated into the R2Veg database. These definitions are based upon even-aged stands. There are no provisions for multiple canopy layers or numerous age classes within the same stand of trees (Hoover and Wills, 1987).

Table 9. Habitat structure stage descriptions

Habitat Structure Stage	HSS Code	DBH Range for Most Trees
Grass Forb	1	Any
Seedling	2	< 1.5 inches
Sapling – Pole	3	> 1.5 inches
Mature	4	> 9 inches

The analysis used GIS information on how stand mortality from MPB would affect the stand structure. Modeling stand mortality from MPB resulted in a reduction in acres in late seral forest (HSS 3 and 4) and an increase in the early seral forest (HSS 1 and 2) (see Figures 3 and 4).

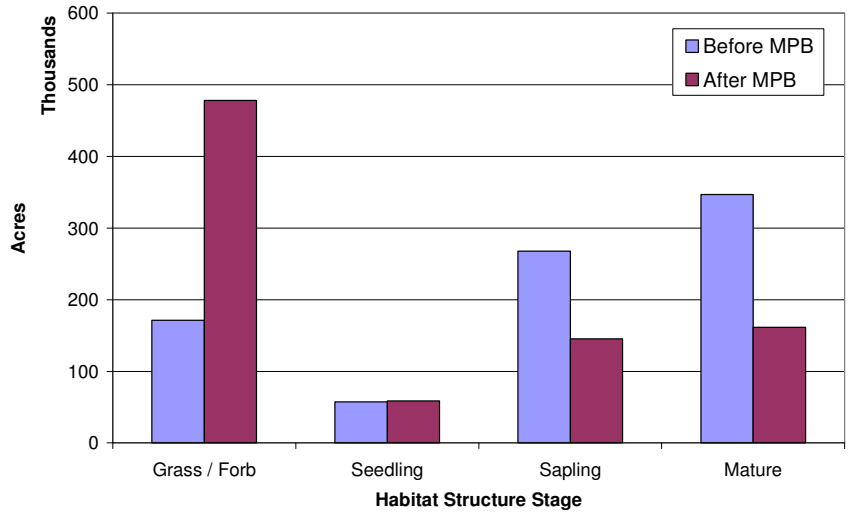


Figure 5. Changes to Habitat Structure Stages predicted from MPB on the MBNF.

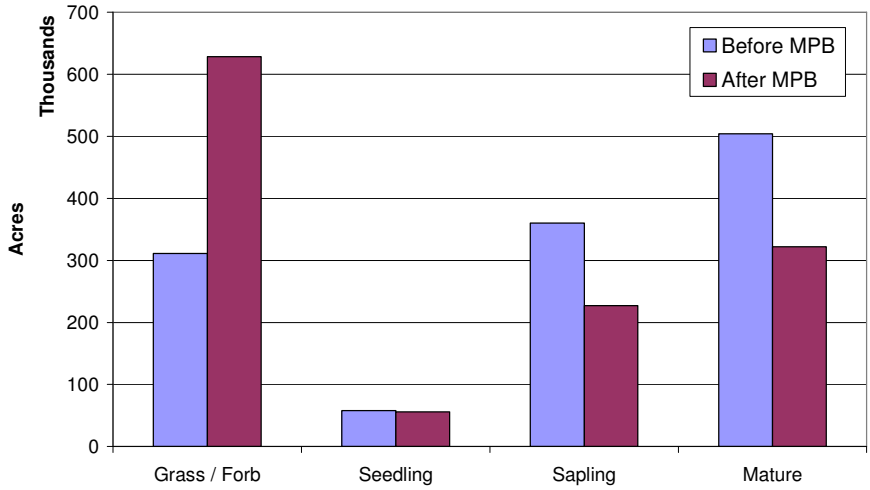


Figure 6. Predicted changes to habitat structure stages from MPB on the RNF.

MBNF

On the Medicine Bow NF, the full effect of the MPB epidemic on HSS changes will occur 3-10 years after the epidemic reached full force. The different areas of the forest had a full force epidemic between 2005-2006. So by 2008, these areas were 2-3 years into effects on HSS.

RNF

On the Routt NF, the full effect of the MPB epidemic on HSS changes will occur 3-10 years after the epidemic becomes widespread. The different areas of the forest were affected by the epidemic between 2002-2003. So by 2008, these areas were 5-6 years into effects on HSS.

Conclusions

The GIS model has predicted that on the MBR there may be a reduction in the late seral forest HSS 3 and HSS 4 and an increase in the early seral forest HSS 1 and HSS 2. The changes that have been occurring have been from the mountain pine beetle, even though we have been managing the MBR, the change from late seral to early seral can be attributed to the MPB.

Recommendations

Evaluate specific forest direction (desired conditions, goals, objectives, standards and guidelines) related to, old growth (MBNF), and late successional forest (RNF).

Restoration, Enhancement and Commodity Production

Medicine Bow Objective 1.b.2
Frequency of Measurement: Annual
Reporting Period: Five Year

This monitoring item asks the question:

To what extent have current conditions and opportunities been identified for restoration, enhancement and commodity production?

The restoration and enhancement portions of this monitoring are given in the Habitat Improvement Monitoring Item below.

Commodity Production

As a ceiling on timber sold from suitable timber lands, ASQ is not a reliable predictor of actual harvest levels or annual timber programs. Annual budgets, project appeals, litigation, market conditions, natural disasters, and changes in national policies affecting resource management all have an effect on the MBR' timber sale program. During the late 1990s and early 2000s, the issues influencing the level of timber sold were project appeals and litigation, both on site specific projects and on the MBNF LRMP. While most of the timber sale projects were eventually offered, the timing of the offers environmental assessments were delayed or the quantity of volume sold was reduced. In the early 2000s, budgets were reduced to a level less than 50 percent of what was necessary to meet average annual ASQ levels for the MBR. In recent years the budgets have improved and the Forest is experiencing fewer project-level appeals.

Project level planning has increased substantially since the start of the beetle infestation with approximately 50-100 MMBF of NEPA approved salvage projects completed annually. The purpose and need for these projects identified and prescribed vegetation treatments for salvage and restoration of beetle killed timber stands, removal of hazard trees from recreation sites and road sides, and creation of fuel breaks designed to protect government and private improvements within National Forests.

MBNF

Table 10. MBNF Timber Sale Program.

	Sold (MMBF)	ASQ (MMBF)	ASQ percent
2004	7.7	22.8	33.77%
2005	10.1	22.8	44.30%
2006	6.2	22.8	27.19%
2007	16.3	22.8	35.70%
2008	16.6	22.8	36.42%
Total	**56.9**	**114**	**49.9%**

The average annual ASQ for the Medicine Bow Plan is 22.8 MMBF/year. ASQ is defined as the quantity of timber that may be sold from the area of suitable land covered by the forest plan for a time period specified by the plan. This allowable sale quantity (ASQ) is usually expressed on an annual basis as the "average annual allowable sale quantity" (FSM 1900). Table 10 illustrates the annual timber program for the MBNF since the implementation of the 2003 Revised Plan.

Table 11. RNF Timber Sale Program 1998 - 2007.

	Sold (MMBF)	10 year ASQ (MMBF)	ASQ percent
1998	15.6		
1999	12.0		
2000	10.3		
2001	.5		
2002	4.6		
2003	9.1		
2004	16.1		
2005	12.9		
2006	24.5		
2007	28.3		
Total	**133.9**	**148.0**	**90.5%**

The average annual allowable sale quantity from the Routt Plan is 14.8 MMBF/year. The ASQ applies to each decade over the planning horizon and includes only chargeable volume. Table 11 and Figure 7 illustrate the annual timber program for the RNF since the implementation of the 1997 Routt Plan.

Fiscal year 2008 represents the first year's timber sale program for the 2nd decade of the Routt Plan. In 2008 the RNF sold approximately 39.6 MMBF, the majority being lodgepole pine killed by the MPB epidemic.

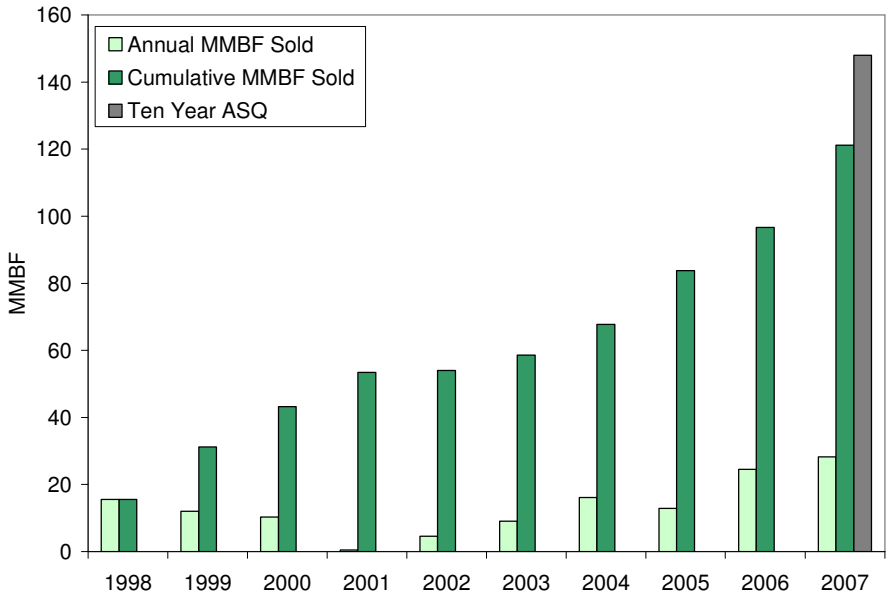


Figure 7. Annual and cumulative MMBF sold on RNF (1998-2007).

Table 12. MBR Planned Timber Sale Offer for 2009 - 2013.

Planned Timber Offer (MMBF)		
	MBNF	**RNF**
2009	35.8	35.7
2010	26.4	71.5
2011	18.0	34.4
2012	23.8	33.8
2013	12.7	10.3
Total	**116.7**	**185.7**

The proposed out- year offer is dependent upon budgets, market conditions, and impact of bark beetle on commercial timber species. Entomologists predict that bark beetle mortality will be so severe that nearly all of the lodgepole pine over 5 inches DBH will be killed. While the ASQ will be recalculated in the next forest plan revision, delaying the revision process until the end of the bark beetle epidemics is recommended. Table 12 displays the planned timber sale offers for FY 2009-2013. However due to the fact that much of the planned offer would be salvage sales, not all of this volume would necessarily be counted towards ASQ.

The wood products industry is currently in a very depressed market. Many mills have closed throughout the country, including the Bighorn Lumber Company (closed in 2009) in Laramie, Wyoming. The Intermountain Resources mill (IMR) at Montrose, CO is still operating. The IMR mill, WY has been closed since 2003, but IMR is planning to open the mill sometime when market conditions approve. Pellet mills are located in Kremmling and Walden, CO. Prospective woody biomass industries are conducting feasibility studies for energy co-generation and cellulosic plants.

Conclusions

The prognosis from the Region 2 Forest Health Management group is that nearly all of the LPP over 5 inches DBH will be killed by the bark beetle epidemic. While the Forest has tried to

implement various strategies to reduce the impacts of the bark beetle, the epidemic continues to expand across Colorado and Wyoming. Currently the Forest Service is implementing strategies and actions that will reduce fire hazard, fuel loadings, and safety hazards in the wildland urban interface, recreation sites, administrative sites, and travel routes.

Historically the MBR main component of the timber program has been large sized live trees providing various products for societies needs. With the anticipated level of mortality primarily in large trees it is anticipated that other markets will develop for dead trees, such as woody biomass, market demand and economic feasibility will need to be strong considerations for current and developing forest products industries.

Recommendations

Review forest plan standards, in both forest plans, relating to snag retention in harvest units, in light of the amount of tree mortality from the MPB epidemic which will result in high densities of snags across the forests.

Ensure Sustainable Ecosystems

Habitat Improvement

Medicine Bow Objective 1.b.3
Routt Monitoring Item 1-6
Frequency of Measurement: Annual
Reporting Period: Annual

These monitoring items ask the questions:

To what extent have habitat improvement needs been identified and implemented using structural and non-structural habitat improvement treatments?

Are habitats for threatened, endangered and Forest Service Region 2 Sensitive species being maintained or enhanced?

PLANTS

Monitoring Protocol/Data Collected

Annually document the number of projects identified and/or implemented that improved habitat for Threatened, Endangered, and Sensitive (TES) plant species.

Results/Evaluation

Rare plant habitat improvement, inventory and implementation monitoring accomplished during 2008 are listed below:

<u>Habitat improvement</u>

- 1 acre exclosure for Rabbit Ears Gilia for NE Sierra Madre AMP
- 2,434 acres of habitat improvement from road closures and decommissioning (Eastern Snowy Range Travel Management (LRD) and on the Sierra Madre Mountain Range (BCH)

Western Prairie Fringed Orchid

Western prairie fringed orchid is a T &E species downstream on the Platte River in Nebraska, and can potentially be affected by changes in water flows. The Forest Service is required to consult with the USFWS when projects on the forest have the potential to affect habitat for this rare plant.

Inventory

- 163,353 acres (estimated total all project areas)

Implementation Monitoring

- 3 projects were monitored for effects to rare plants during and/or after implementation.

Conclusions

Road closures, when implemented, will improve habitat for sensitive and/or local concern species and habitat.

Recommendations

Continue to monitor this item yearly over the life of the plan.

AQUATIC SPECIES

Results/Evaluation:

Habitat Improvement

MBNF

Between 2004 and 2008 the Medicine Bow National Forest has implemented the following structural-improvement project and non-structural improvement projects to improve and protect Colorado River Cutthroat Trout (CRCT) habitat:

- Modification of the plunge pool associated with the natural waterfall located in the lower, North Fork Little Snake River (NFLSR); and mechanical removal (electrofishing) of rainbow trout from downstream and upstream of the waterfall in the lower NFLSR.
- A variety of stream crossings have been "hardened" to improve habitats for MIS trout. In addition, a few corrugated metal pipes (CMPs) have been replaced with bottomless arches to improve fish passage for MIS "common" trout.

The results of the aforementioned treatments are: protect and improve CRCT habitats upstream of the lower NFLSR waterfall; and reduce sedimentation and improve fish-passage conditions for MIS trout in the Medicine Bow National Forest.

RNF

Between 1999 and 2008 the Routt National Forest has identified and implemented several structural and non-structural habitat improvements designed to benefit CRCT habitats. For example, the Routt National Forest has implemented the following structural-habitat improvements:

- Coal Creek fish barrier; constructed a spawning channel.

- Installed an aerator in Vaughn Lake.
- Mechanically remove (i.e. electrofishing) brook trout from about fifteen miles of CRCT habitats such as those in Armstrong Creek (2.0 miles).
- Replaced two culverts from CMP's to bottomless arch and removed five culverts removal (to hardened crossings).

Some CRCT habitats in the Routt National Forest are stable to improving while a few others have been degraded (e.g. Lost Dog Creek) or are at risk of degradation due to multiple-use activities and water development.

Between 1999 and 2008 about 400 meters of riparian-habitat fencing was installed in California Park to protect boreal toad breeding habitats in Elkhead Creek. The section of Elkhead Creek protected by the riparian fence is known breeding habitat.

Habitat improvement projects completed for aquatic habitat are included in the watershed, streams and lakes improvements in the Water Quality Monitoring Item.

Threatened and Endangered Species

No direct monitoring/evaluation protocol implementation during 2004-2008 is applicable to federally-listed species (see Table 13) because they are not extant in either the Medicine Bow National Forest or in the Routt National Forest.

Results/Evaluation:

Table 13. Federally-listed fish in the Colorado River and Platte River basins.

Species	Scientific Name	River System	Federal Status
Bonytail	Gila elegans	Colorado	Endangered
Colorado Pikeminnow	Ptychocheilus lucius	Colorado	Endangered
Humpback Chub	Gila cypha	Colorado	Endangered
Pallid Sturgeon	Scaphirhynchus albus	Platte	Endangered
Razorback Sucker	Xyrauchen texanus	Colorado	Endangered

The MBR continues to comply with all of the requirements to consult with the U.S. Fish and Wildlife Service (USFWS) when projects that could deplete water from the upper-Colorado River (including the Yampa River) and the Platte River basin are proposed for implementation. Proposed projects that may indirectly affect habitats for the species listed in Table13 undergo consultation with the USFWS.

The federally-listed fish species found in Table 13 are typically found scores of miles downstream from the Routt and Medicine Bow Forest boundaries. However, natural-resource management projects that occur within the Forest that could affect the timing and/or magnitude of streamflow for many miles downstream; water depletions have been found to adversely affect habitats and populations of these species in the Colorado River, Platte River and Yampa River basins. In addition, in FY08 and in past years, there has been a concerted effort by forests personnel to process Ditch Bill Easements pertinent to water-depletion facilities in the Platte, upper Colorado, and Yampa River basins.

Recommendations:

Continue to consult with the USFWS about the potential impacts of proposed projects that could deplete water from the Upper-Colorado, Yampa, and Platte River basins.

Continue to improve habitats for aquatic and amphibian R2 Sensitive Species and MIS trout using a variety of well-chosen structural and non-structural improvement treatments. Monitor and assess the efficacy of the treatments.

Terrestrial Wildlife

Monitoring Protocol/Data Collected

The Forests track the number acres of terrestrial habitat improved or enhanced.

Results/Evaluation

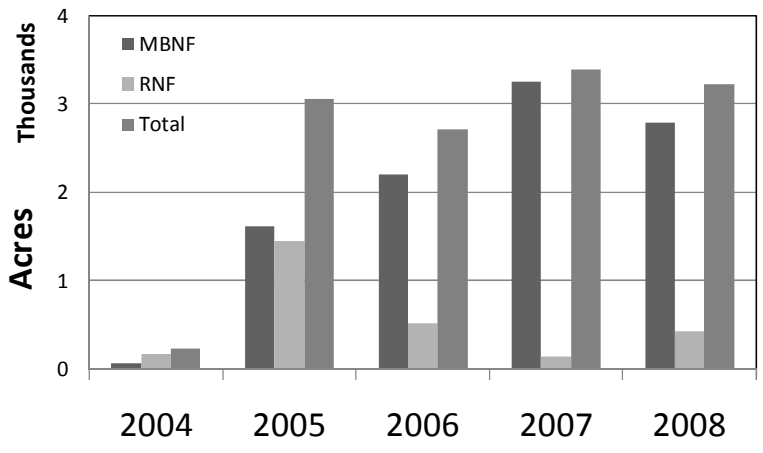
In 2008, 3,220 acres of terrestrial wildlife habitat were enhanced on the Medicine Bow-Routt National Forests. Of these, 2,794 acres were accomplished on the Medicine Bow NF and 426 acres on the Routt NF.

Combined, the two Forests completed 1694 acres through road decommissioning, 1,220 acres through the use of prescribed fire, 206 acres of seeding, and 100 acres through grazing exclosure rehabilitation in Table 14.

Table 14. Terrestrial wildlife habitat improvement accomplished in FY08.

	Project	Acres
Medicine Bow NF		
LRD	Road Decommissioning	1,200
BCH	Road Decommissioning	494
	Prescribed Burn	1,100
Routt NF		
HPBE	Seeding for Columbian Sharp-tailed Grouse	206
Parks	Prescribed Burn	120
Yampa	Exclosure re-conditioning	100
Total		**3,220**

Over the past five years, the two Forests have combined to accomplish approximately 2,500 acres of terrestrial wildlife habitat improved or enhanced annually (Figure 8). This amount has tended to increase over the past few years. The activities that have contributed the greatest acreage amounts during this time have been road decommissioning and prescribed fire. Both of these management activities have multiple benefits to a wide variety of species; but they are usually targeted towards big game winter range improvement and security area protection. Prescribed fire is used in sagebrush and adjacent aspen stringers to rejuvenate grasses and forbs, re-sprout bitterbrush, and re-seed sagebrush over the long term. Fire creates a mosaic of vegetation succession stages improving habitat conditions for mule deer, elk and other sagebrush ecosystem associates. Road decommissioning can improve summer habitat for Columbian sharp-tailed grouse (R2 Sensitive Species) and reduce disturbance to mule deer, elk, moose, and bighorn sheep. Both Forests have developed important



partnerships over the past few years; and partners like the Rocky Mountain Elk Foundation, Wyoming Wildlife and Natural Resource Trust Fund, Mule Deer Foundation, Habitat Partnership Program, Bureau of Land Management, and Colorado Division of Wildlife among others continue to contribute to accomplishing important wildlife habitat improvement on National Forest lands.

Figure 8. Habitat improvement acres 2003-2008

Recommendations

Continue to move toward increasing funding available for habitat improvement projects and continue to partner with interested groups in order to complete such projects. Strive to increase the number of projected acres of terrestrial habitat enhanced each year. Place more emphasis on habitats that contribute to maintaining well-distributed populations of TES species native to the Medicine Bow and Routt.

Old Growth and Late Successional Forest Structure

Medicine Bow Item Objective 1.b.4
Routt Monitoring Item 1-8
Frequency of Measurement: Annual
Reporting Period: Annual/5 year

These monitoring items ask the questions:

Is old growth forest mapped and managed at least to minimum amounts and distribution stated in the plan?

How are management activities affecting late successional forest structure in Management areas 5.11 and 5.13?

Introduction

The Medicine Bow and Routt Forest Plans address old forests differently. The Medicine Bow Forest Plan has desired conditions, objectives and standards relating to the amount and distribution of *Old Growth*. The Routt Forest Plan described desired conditions for *Late Successional Forest*.

Monitoring Protocol/Data Collected

Medicine Bow NF

Old growth forests are ecosystems distinguished by relatively complex visible structure or external morphology, horizontal variability, relatively large old trees and related structural

attributes (Thomas et al. 1988, Hayward 1991). Old growth encompasses the later stages of stand development that typically differ from earlier stages in a variety of characteristics which may include tree size, accumulations of large dead woody material, number of tree top layers, species composition and ecosystem function. It can require 80-200 years for forest stands within different cover types to develop the characteristics of old growth (Mehl 1992).

Old growth mapping was completed in 2008 using the cover type descriptions of old growth by Mehl (1992) (Kay, S.H for Mary H. Peterson. 2008). Old growth can be described in terms of the age of the largest trees, a minimum number of trees above a certain diameter (DBH) and canopy characteristics. Table 15 displays three of these criteria of old growth by cover type.

Table 15. Old growth description by cover types.

Cover Type	Age of Largest Trees	Diameter of Largest Trees	Canopy Description
Lodgepole	150	10 tpa* > 10 inches	≥ 1 canopy layer
Spruce-fir	200	10 tpa > 16 inches	>1 canopy layer
Ponderosa pine	200	10 tpa > 16 inches	≥ 1 canopy layer
Aspen	100	20 tpa > 14 inches	≥ 1 canopy layer >50% cover

*tpa = trees per acre. Source (Mehl 1992)

The forest identified an implementation strategy that mapped more than the minimum percentage of old growth for each cover type as shown in table 16 (Peterson, 2008).

Table 16. Inventoried and mapped old growth by mountain range for Sierra Madre and Snowy Range.

Mountain Unit	Cover Type	Total Cover (Acres)	Required Minimum Forest Plan Standard (Percent)	Old Growth Strategy (Percent)
Sierra Madre	Aspen	47,554	20	22
Sierra Madre	Lodgepole	138,213	15	18
Sierra Madre	Ponderosa	0	25	0
Sierra Madre	Spruce/Fir	53,170	25	31
Snowy Range	Aspen	15,498	20	21
Snowy Range	Lodgepole	281,633	20	20
Snowy Range	Ponderosa	164	80	80
Snowy Range	Spruce/Fir	107,006	32	32

Results

The full effect of the MPB epidemic on cover type changes is expected to occur 3-10 years after the epidemic reached full force. The different areas of the MBNF had a full force epidemic between 2005-2006. So by 2008, these areas were 2-3 years into effects on HSS. Table 17 gives the predicted change in crown cover for the different old growth cover types.

For Aspen and Ponderosa Pine Cover Types

Lodgepole pine may sometimes be a minor component of stands in the aspen and ponderosa pine old growth cover types. These LPP trees may die as a result of the MPB, however, there is no anticipated impact to Aspen old growth status from expected LPP stand mortality

Table 17. Change in tree cover from simulated MPB effects averaged across mountain ranges

Mountain Unit	Cover Type	Old Growth Strategy (acres)	Old Growth with Changed Crown Cover from MPB Epidemic (acres).	Average Crown Cover before MPB (percent)	Average Crown Cover after MPB (percent)
Sierra Madre	Aspen	10,577	4,064	54	42
Sierra Madre	Lodgepole	24,773	24,751	54	12
Sierra Madre	Ponderosa	0	0	0	0
Sierra Madre	Spruce/Fir	16,716	5,617	51	38
Snowy Range	Aspen	3,303	2,216	54	37
Snowy Range	Lodgepole	55,201	54,849	54	12
Snowy Range	Ponderosa	132	117	44	24
Snowy Range	Spruce/Fir	34,701	13,894	60	46

For Spruce/Fir Cover Type

Within old growth stands in the Spruce/Fir cover type, there were large old lodgepole pine trees that contributed to the quality of the old growth. The MPB has probably killed these large old lodgepole pine. In a study in northwest Wyoming, mixed conifer species stands of up to 36 percent trees of other species were proportionally as susceptible to beetle infestation as those having less than 10 percent trees of other species (Amman and Baker 1972). However Amman (1977) also indicates that there was a lower level of MPB infestation in the Subalpine fir/grouse whortleberry habitat type for the Teton and Targhee National Forests. Subalpine fir/grouse whortleberry is a component of Spruce/Fir cover type on the MBNF (Alexander et al. 1986). This death of these large old lodgepole pine may reduce the number of live old trees greater than or equal to 16 inches in diameter, a required attribute for old growth and will reduce the canopy cover, also a required attribute. This will change some old growth attributes within these stands, but may not eliminate these stands as components of the inventoried and mapped old growth.

The death of large, old lodgepole pine will also contribute to other attributes such as standing dead and down dead. When these dead trees fall, they create dead wood structures valuable for wildlife, this aspect of old growth habitat may improve.

Lodgepole Pine Cover Type

Stands of old growth within the lodgepole pine cover type may have a pure canopy of lodgepole pine or may have mix of lodgepole pine and other species (mostly Engelmann spruce and Subalpine fir but also possibly aspen and Douglas-fir). When the large, old lodgepole pine are killed by MPB, the stand may no longer have the components to meet the required live tree attributes of old growth, (10 or more live trees greater than 10 inches in diameter and at least 150 years old.)

It is probable that there are no remaining stands within the inventoried and mapped lodgepole pine cover type that retain the standard attributes of old growth and still qualify within the lodgepole pine cover type after mortality. This represents a dramatic change in distribution as well as abundance of lodgepole pine old growth

Cover Type Changes

Where there are multi-species stands, trees of other species that remain alive in the lodgepole old growth stands, the cover type may change (cover type is based on majority of stocking by tree species) and these stands may no longer qualify as old growth within the lodgepole pine cover type but may or may not qualify as old growth under a different cover type such as spruce-fir.

Tables 18 and 19 display the changes to cover type for stands with lodgepole pine mortality from MPB (cover types with very minor changes are not displayed in the tables below). Most of the lodgepole pine cover type which was predicted to die from the beetle epidemic, was then classified in the model as grass due to the lack of information about the forest understory vegetation. However, it is expected that aspen and spruce-fir cover type may increase as a result of the beetle epidemic.

Table 18. Predicted changes to cover type on Sierra Madre from MPB death of lodgepole pine.

Cover type	Before MPB	After MPB	Difference
Aspen	47,554	51,705	4,151
Lodgepole pine	138,213	16,927	-121,285
Spruce Fir	53,170	59,879	6,710

Table 19. Predicted changes to cover type on Snowy Range from MPB death of lodgepole pine.

Cover type	Before MPB	After MPB	Difference
Aspen	15,498	18,145	2,647
Lodgepole pine	281,633	61,411	-220,222
Spruce Fir	107,006	126,999	19,993

Table 20 and Figure 9 display the number of acres of inventoried and mapped old growth within the LPP cover type that have some amount of spruce-fir and may transition to the spruce-fir cover type where there is generally 20 percent or greater of cover from spruce-fir. 17,174 acres of LPP cover type have the potential to shift to old growth spruce-fir cover type.

Table 20. Predicted shift from lodgepole pine to spruce-fir cover type from MPB death of lodgepole pine

Amount of spruce-fir in LPP old growth	Acres
Greater than or equal to 5%	39,101
Greater than or equal to 10%	29,108
Greater than or equal to 20%	11,952
Greater than or equal to 25%	5,225

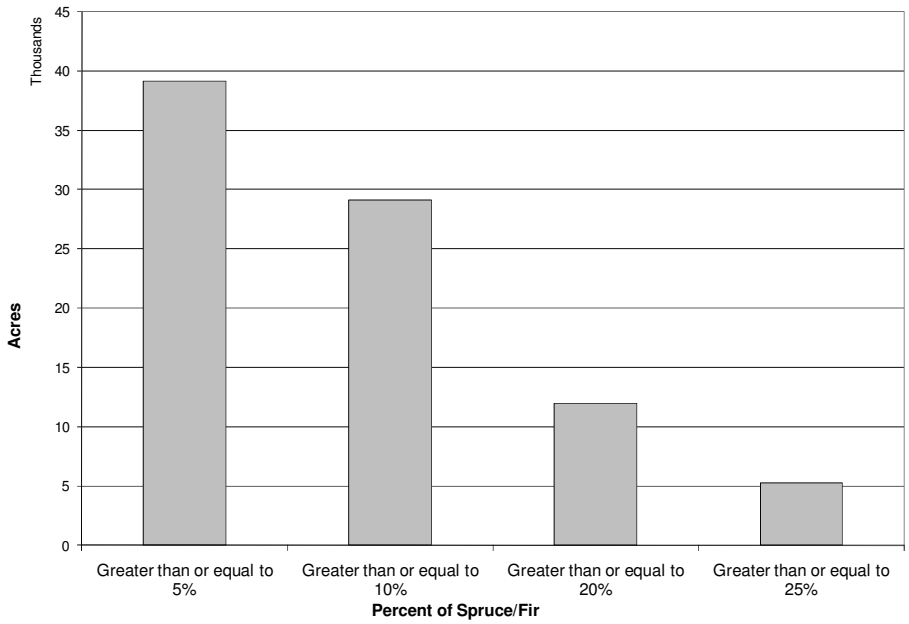


Figure 9. Acres of inventoried and mapped old growth with lodgepole pine cover type by amount of spruce-fir.

Old growth within other cover types is not predicted to experience a change in amount or distribution. Other cover types are expected to retain old growth characteristics although the LPP component would likely have high mortality from the MPB epidemic.

The MBNF Biological Diversity Standard states:

> "If stands meeting the old growth definition do not exist at these percentages, manage additional stands that are closest to meeting old growth criteria as recruitment old growth to meet these desired percentages."

The stands that are closest to meeting old growth criteria would likely be within the mature habitat structure stages and have sufficient canopy cover to be classified as HSS 4B and 4C (trees over 9 inches in diameter and crown cover over 41 percent).

With changes in cover type, it is difficult to estimate how much of a reduction there has been for old growth for each cover type. However with the mortality occurring to LPP, the LPP cover type will represent the largest amount of the cover type affected. Looking at all cover types:

HSS 4B+4C before MPB = 272,434 acres
HSS 4B+4C after MPB = 96,091 acres

This represents a 35 percent reduction in the amount of mature HSS after the MPB epidemic and is expected to represent 11 percent of the forested acres across the forest. This does not represent much of a pool from which to replace the current inventoried and mapped old growth.

Routt NF

The Routt Forest Plan predicted that the majority of the forest would be in late successional stands, and that over time more of the forest would move from younger and smaller age classes into older, late successional forest. The following is from the Desired Condition section of Chapter 1 of the Routt Forest Plan:

The Forest in Ten Years

The majority of the forest will be in late successional habitats, with a portion in early to mid successional habitats.

The Forest in Fifty Years

The vast majority of the forested areas will be in late successional habitats.

The Routt Plan grouped HSS 4b, 4c, and 5 together as late successional forest. Amounts of late successional component reported in the Routt Plan FEIS are given in the following table.

Table 21. Routt Habitat structural stage descriptions and percentages*

Structural Stage Name and Number	Percent of Forested Total
Grass/forb – 1	1.3
Seedling/sapling – 2	2.5
Pole (Total) - 3a 3b 3c	35.4
Mature (Total) - 4a 4b 4c 5	60.9
Late Successional Component - 4b 4c 5	49.1

*From Routt Plan FEIS table 3-25

By cover type, the RNF reported the following amounts of late successional forest in 1997[3], as displayed in Table 22. This is total of 539,000 acres or 43 percent of forested cover types.

Table 22. Acreage and percent structural stage by cover type from RNF LRMP FEIS Table 3-34.

Cover Type	1		2		3		4		Late Successional (4a 4b 5)	
	Ac	%	Ac	%	Ac	%	Ac	%	Ac	%
Spruce-fir	4,595	1.0	6,183	1.4	123,045	27.1	320,154	70.5	254,317	56.0
Lodgepole pine	5,507	1.5	15,688	4.1	138,642	36.6	219,260	57.8	180,132	47.5
Aspen	4,378	1.7	5,077	2.0	125,439	48.2	125,470	48.2	101,616	39.0
Douglas-fir			69	1.3	1,406	26.3	3,861	72.4	2,939	55.1

The R2Veg database does not include HSS 5, which is referred to in the Routt Plan. Many of the acres of HSS 5 would now be counted as HSS 4B or C, however, HSS 5 stands with widely spaced, larger diameter trees (canopy cover < 40) would now fall into other habitat structure stages, or could be considered a non-forested stand. The change from the RMRIS database to R2Veg included remapping forest stands at a finer scale which also changed the acres calculated for the different HSS classes. For these reasons, the acres of late successional forest estimated for the RNF 5 Year Review (2003) do not match the pre MPB epidemic late successional acres calculated for this analysis.

[3] The analysis for the 1998 revision of the Routt Forest Plan was calculated using 1997 data.

Results

Table 23. Predicted change in late successional forest on Routt NF from MPB

HSS	NFS Acres Before MPB	NFS Acres After MPB
4B	244,811	176,101
4C	235,662	87,507
Total	480,473	263,608

The full effect of the MPB epidemic on cover type changes will occur 3-10 years after the epidemic reached full force. The different areas of the RNF had a full force epidemic between 2002-2003. So by 2008, these areas were 5-6 years into effects on late successional forest.

After MPB, the Routt NF will have only 21 percent of the forest in late successional habitat (Table 23 and Figure 10); which represents a reduction from the 49 percent of the forest calculated at the time of the forest plan revision in 1998.

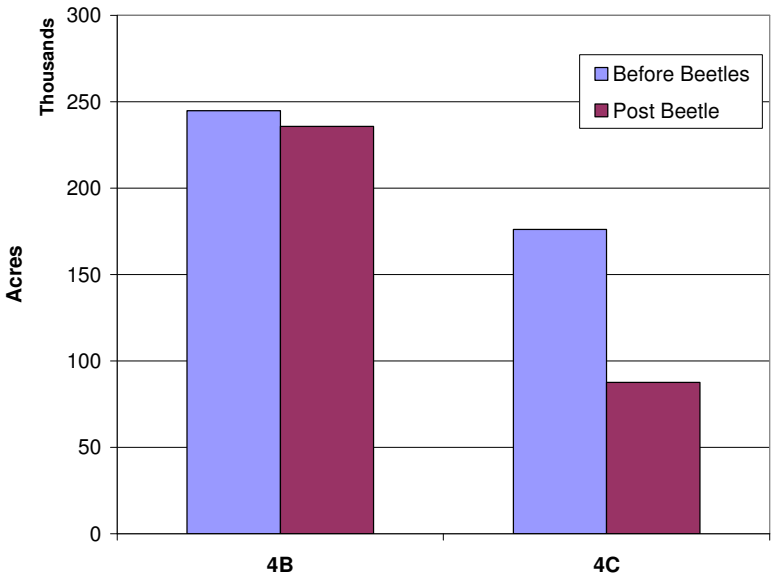


Figure 10. Predicted change in late successional forest from MPB epidemic.

Aspen Cover Type

Lodgepole pine may sometimes be a minor component of late successional aspen stands. These LPP trees may die as a result of the MPB. However, there is no anticipated impact to late successional status from LPP stand mortality from MPB in these stands of late successional aspen.

Spruce-fir Cover Type

Within late successional stands in the spruce-fir cover type, there were large (>9 inches), old LPP trees that contributed to the quality of the late successional stand. The MPB has probably killed these large old LPP. The mortality of these large, old LPP may reduce the number of live old trees and will reduce the canopy cover. This will change some attributes within these late successional stands, but may not eliminate these stands as components of the late successional forest on the Routt NF.

The death of large, old LPP will also contribute to other attributes such as standing dead and down dead. When these dead trees fall, they create dead wood structures valuable for wildlife, this aspect of late successional habitat may improve.

Lodgepole Pine Cover Type

Stands of late successional forest within the LPP cover type may have a pure canopy of LPP or may have mix of LPP and other species (mostly Engelmann spruce and Subalpine fir but also possibly aspen and Douglas-fir). When the large, old LPP are killed by MPB, the stand may no longer have the components to meet the standards for late successional forest such as the majority of trees >9 inches DBH and ≥41 percent cover.

Where there are trees of other species that remain alive in these stands, the cover type may have changed (cover type is based on majority of stocking by tree species) and these stands may no longer qualify as late successional forest within the LPP cover type but may or may not qualify as late successional forest under a different cover type such as spruce-fir. It is probable that there will be no remaining stands within the LPP cover type that retain late successional attributes after the predicted LPP stand mortality. This represents a dramatic change in distribution as well as abundance of late successional LPP stands.

Management Areas 5.11 and 5.13[4]

The Routt Plan describes desired conditions related to late successional forest for these two management areas:

Management Area 5.11:

Abundant late successional forest structure will be provided throughout the area by extending the rotation ages.

Management Area 5.13:

A variety of habitat structural stages will be present, although late successional forests are less common than in most other management areas.

Table 24. Late Successional Forest in RNF Management Areas 5.11. and 5.13.

Management Area	Habitat Structural Stage	Before MPB (Acres)	After MPB (Acres)
5.11	4B	57,675	41,221
	4C	61,925	31,882
	5	--	--
	SubTotal	119,599	73,103
5.13	4B	36,620	23,438
	4C	55,528	12,686
	5	--	--
	SubTotal	92,148	36,123
Total		211,747	109,226

[4] The Routt Plan has a 5-year monitoring item relating to late successional forest in MA 5.11 and 5.13 which is addressed in the Medicine Bow-Routt 5 and 10 year Review.

Additional direction is included in Geographic Area direction, which is included in the conclusions below. Table 24 and Figure 11 display the projected change in late successional forest in these two Geographic Areas.

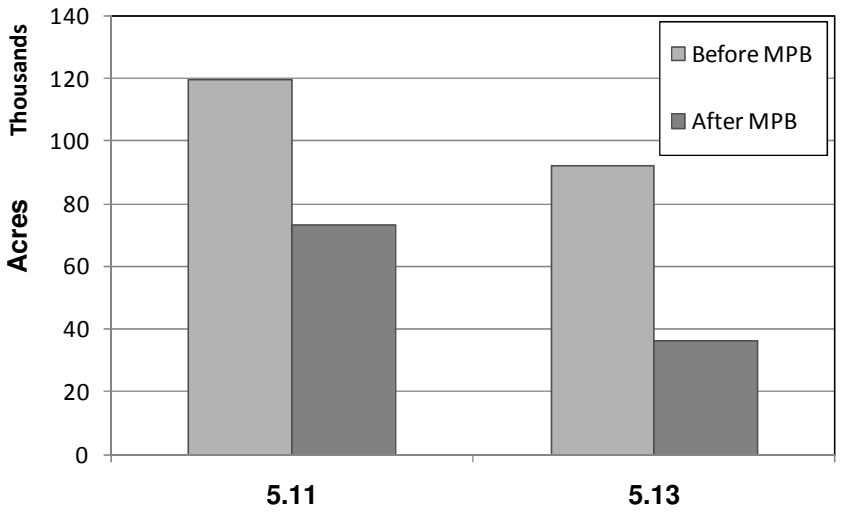


Figure 11. Late Successional Forest in MAs 5.11 and 5.13 on RNF before and after MPB Epidemic.

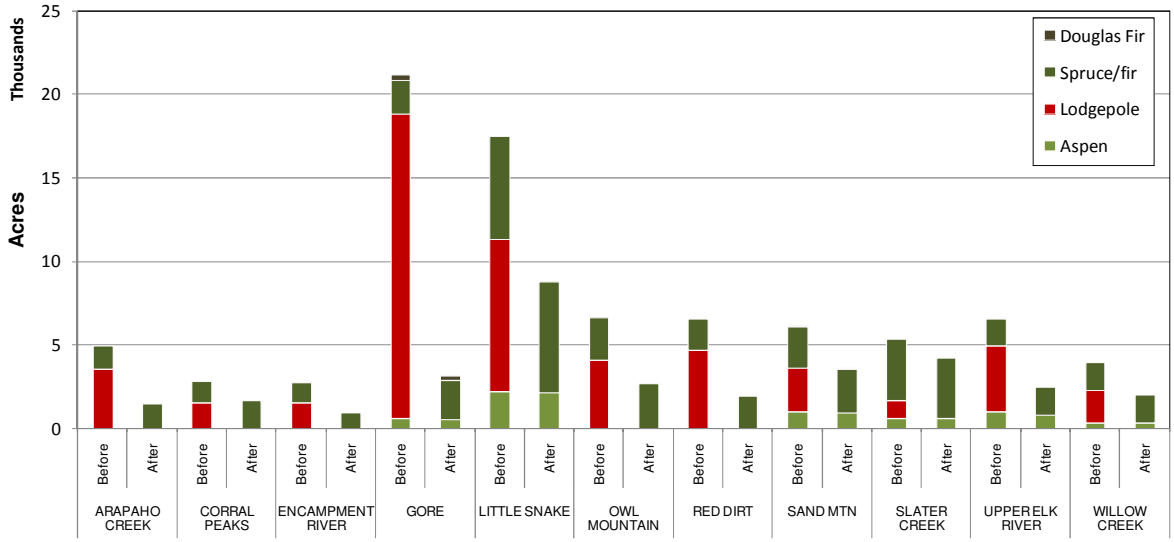


Figure 12. Predicted change in Late Successional Forest in GA from MPB epidemic.

The Geographic Areas with the largest amount of Lodgepole late successional forest have the greatest predicted change from the MPB epidemic (Figure 12).

Recruitment for Late Successional Forest

Stands that might recruit into HSS 4B the soonest would be stands within HSS 4A or 3B. Stands within HSS 4A would need to increase in cover and stands within HSS 3B would need to increase in the diameter of the majority of the trees.

HSS 4A after MPB:	58,197 acres
HSS 3B after MPB:	120,518 acres
Total	178,715 acres

Conclusions

Medicine Bow NF

Old Growth:

- A decrease in standing large LPP is expected with an increase in snags and dead and down wood from dead LPP within spruce-fir cover type, but it is not expected that these stands will lose old growth characteristics.
- A loss of virtually all old growth is projected in Lodgepole Pine Cover Type.

Recruitment Old Growth:

- HSS 4b and 4c are the most likely stands to manage as recruitment old growth, however the LPP beetle epidemic will reduce HSS 4b+4c to 11 percent of the forested acres across the forest. Even if all HSS 4B&4C was managed as recruitment old growth, it still would not meet the current standard for a minimum percent by mountain range.
- Current natural ecological conditions may not provide for sustainability of ecological functions from the reduction of old growth due to MPB epidemic.

Routt NF

Many of the provisions for sustainability of ecological functions of the forest were based upon the abundance of late successional forest prior to the MPB epidemic. Since the MPB epidemic altered the representation of late successional stands throughout the Routt NF, it is no longer possible to have confidence that the changed conditions will provide sustainability of pre-existing habitats.

Recommendations

Evaluate specific forest direction (desired conditions, goals, objectives, standards and guidelines) related to old growth (MBNF), and late successional forest (RNF). Management direction concerning management of old growth (MBNF) and late successional (RNF), and identification and management of potential recruitment stands, would be beneficial to guide management of the two forests until the forest plans are revised in the future.

Threatened, Endangered, Sensitive Species and MIS Habitat and Populations

Medicine Bow Objective 1.b.5
Routt Monitoring Item 1-12
Reporting Period: Five Year

These monitoring items ask the questions:

What is the relationship between changes in habitat and population trends of management indicator species?

To what extent are listed species, sensitive species and species of local concern and MIS species habitat availability, habitat quality and populations maintaining stable or positive trends?

PLANTS

Monitoring Protocol/Data Collected

MPB effects on three different habitats were analyzed for the rare plant species dependent upon those habitats. Alpine habitats are not expected to change due to the MPB epidemic and so were not include in this analysis. The habitats analyzed were:

- Late Successional Forest
- Sagebrush shrublands and meadows (includes some aspen areas)
- Wetlands (including fens)

The changes to late successional and old growth forests, changes to the treeline where lodgepole pine abuts sagebrush shrublands and changes in tree cover near wetland-fens were modeled.

Fen modeling used National Wetlands Mapping and Peatland Inventory for the MBNF (Cowardin et al. 1979, Heidel and Laursen 2003, USFWS 2008). Changes in tree cover within 100 feet of wetland-fens was modeled using the MBP tree mortality modeling.

Appendix **A** list the rare plants associated with the habitats analyzed. These tables indicate presence or absence of habitat for these plant species however not all plants have been documented on the forests. Currently, there is habitat for one Threatened (T) plant species on the MBNF, Ute Ladies' Tresses (*Spiranthes diluvialis*), although the plant has not yet been found on the Forest.

Plants that are rare across the entire Rocky Mountain region and for which there is a significant current or predicted downward trend in population numbers or density, or significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution are designated as Sensitive (SS). Those rare plant species that have either of the above conditions on the MBR, but not the entire Rocky Mountain region, are considered to be Species of Local Concern (LC)[5].

[5] USDA Forest Service Rocky Mountain Region. 2003. USDA Forest Service Rocky Mountain Region. 2003. Regional Planning Desk Guide Chapter 27: Selection of Sensitive Species, Species of Local Concern, and MIS in R2. Rocky Mountain Region, Lakewood, CO. On file at Medicine Bow-Routt National Forests and Thunder Basin National Grassland Supervisor's Office, Laramie, WY.)

Results

MBR

Ute Ladies' Tresses (Medicine Bow NF only)
Ute Ladies' Tresses (*Spiranthes diluvialis*)(threatened) is associated with subirrigated meadows below 7,000 feet in elevation on the MBNF (Kelly 2008). Changes could occur to this habitat where it is within one-half mile of medium, large or very large lodgepole pine.

Modeling lodgepole pine stand mortality from MPB resulted in 8.8 acres of potential habitat for Ute Ladies' Tresses affected. The change in evapotranspiration associated with tree death (Potts 2007) may affect the hydrology of these meadows, possibly increasing moisture or increasing the size of the meadow. This could increase, be neutral or be detrimental to Ute Ladies Tresses habitat. Most of these areas have not been surveyed for the presence of this threatened species.

Late Successional and Old Growth Habitats

Modeling lodgepole pine stand mortality from MPB resulted in a modeled decrease of 393,208 acres of late successional and old growth structure stages. For the plants associated with this habitat, this represents a decrease in habitat availability. This is a reduction of 48 percent across the two forests.

Sagebrush Shrub or Meadow Habitats

Modeling lodgepole pine stand mortality from MPB resulted in 9,228 acres of dead lodgepole pine adjacent to sagebrush shrub or meadow adjacent where the treeline could shift and the rare plants associated with these habitats could increase in extent or the death of the lodgepole pine could create transitory habitat for rare plants associated with sagebrush. This represents an increase in habitat for the rare plant species associated with this habitat.

Wetland and Fen Habitats
Modeling lodgepole pine stand mortality from MPB resulted in a decrease of 341,508 acres of lodgepole pine within 40 feet of modeled fens. The change in evapotranspiration associated with tree death (Potts 2007) may affect the hydrology of these fens, possibly increasing moisture and changing the overall size of the wetland or decreasing the amount of habitat available to fen vegetation through inundation or flooding of portions of the fen. Some fen plants are highly adapted to particular positions within the fen; which will reduce the amount of habitat that is available to some and increase habitat available to others.

<u>Methodology</u>
Mapping of snow compaction occurred during the winter of 2006/2007 by a project funded by the MBR and completed by the Wyoming Natural Diversity Database (Keinath and McCumber, 2007).

The survey mapped anthropogenic snow compaction in the Medicine Bow - Routt National Forest by observing and systematically recording evidence of compaction (e.g., ski tracks, snowmobile trails) from low-flying aircraft. Such flight-based surveys allowed the project to cover relatively large areas where land-based study was financially and logistically prohibitive. The study methodology built on the well established methodology used for wildlife track surveys.

Results

Table 25. Winter Recreation Snow Compaction in Riparian/Fen Areas*

Riparian/Fen Type	Riparian / Fen Area	Riparian / Fen areas which intersect with mapped snow compaction areas	
	(acres)	acres	percent
MBNF (Sierra Madre and Snowy Range)			
Confirmed Fens	1,529	181	11.8
Estimated Fens	29,666	1,387	4.7
Riparian Areas	42,818	737	1.7
MBNF Subtotal	74,013	2,305	3.1
Routt			
Potential Fen	87,742	11,633	13.26
Riparian Areas	46,486	681	1.46
Routt Subtotal	134,228	12,314	9.17
MBR Total	**208,241**	**14,619**	**7.0**

* Estimated Fens on the MBNF were estimated from the National Wetlands Inventory (NWI 1991) and on the RNF from the MBR GIS data.

The survey results indicate that snow compaction from winter recreation covers roughly 1/3rd of the forest area. Approximately 250 thousand acres of open land and 434 thousand acres of forested land are affected by winter recreation. Table 25 gives the area mapped within wetland and riparian areas.

The data indicates that there are more acres of potential fens for the RNF than for the MBNF. The interaction of mapped snow compaction and potential fens is also greater on the RNF than for the MBNF. Overall, the percent of snow compaction within fens and riparian areas indicates that there are areas of fens and riparian with little or no effects from snow compaction.

Conclusions

Overall Conclusions for both Forests:
The changed condition has affected habitat availability for threatened, sensitive and local concern plant species. Some rare plant habitat would be changed by MPB mortality - with some species losing habitat, some species gaining habitat while others would be unaffected.

- Rare plants associated with late successional forest would have decreased amounts of available habitat.
    - Late successional forested habitats which persisted would be important refugia[6] for certain elements of plant diversity.

[6] An area that has escaped ecological changes occurring elsewhere and so provides a suitable habitat for relict species.

- Rare plants associated with sagebrush shrublands and meadows are predicted to have increased habitat available. Especially for those species which depend on a shifting mosaic of suitable habitats for long term persistence.
    - Plant Species such as Rabbit Ears gilia, large flowered triteleia and roundleaf sundew may benefit.
- Rare plants associated with wetland and fen habitats may benefit from changes however;
    - Individual fens or parts of fens could be flooded resulting in habitat reduction.
- Rare plants associated with other riparian habitats are predicted to have;
    - Increased potential damage to stream banks from increased runoff.

Recommendations

- Limit and/or reduce disturbance in remaining late successional forest habitats and near fen/wetland habitat to maintain certain elements of plant diversity. **Provide interim direction.**
- Evaluate specific forest direction (desired conditions, goals, objectives, standards and guidelines) related to MIS/SS habitat, old growth (MBNF), and late successional forest (RNF) to determine if additional direction and/or modification is needed to make the plans relevant to the changed conditions.
- Additional sensitive species have been found on the RNF since the Routt Plan was revised. To be consistent with TES standard #7, the appropriate analyses need to be conducted to determine if adjustments in the forest plan are needed.
- Additional sensitive species have also been found on the MBNF since the Medicine Bow Plan was revised. There are no inconsistencies noted with the Plan and management of sensitive species.
- Commercial quantities of genetically local native plant materials specific to the RNF will be available in 2013. Prioritize use as directed by National FS direction, and Routt Plan guidelines and forest recommendations.

AQUATIC ANIMAL SPECIES

Monitoring Protocol/Data Collected

Table 26. Region 2 aquatic sensitive species located on the Medicine Bow-Routt NFs.

Species	Scientific Name	Forest
Fishes		
Colorado River Cutthroat Trout	*Oncorhynchus clarki pleuriticus*	Medicine Bow-Routt
Mountain Sucker	*Castostomus platyrhynchus*	Medicine Bow-Routt
HornyHead Chub[7]	*Nocomis biguttatus*	Medicine Bow
Amphibians		
Boreal Toad	*Bufo boreas boreas*	Medicine Bow-Routt

[7] This species has not yet been found on Forest, however it was found in the North Laramie River on private land adjacent to the Medicine Bow NF and it is assumed to occur on the Forest.

Species	Scientific Name	Forest
Northern Leopard Frog	*Rana pipiens*	Medicine Bow-Routt
Wood Frog	*Rana sylvatica*	Medicine Bow-Routt
Insects		
Hudsonian Emerald	*Somatochlora hudsonica*	Medicine Bow - Routt
Mollusk		
Rocky Mountain Capshell Snail	*Acroloxus coloradensis*	Routt

FISH

Monitoring Protocol/Data Collected

Three-pass depletion electrofishing techniques were used to estimate population abundance (number of trout per mile) for MIS trout and CRCT. Data collected include: species identification; weights (grams); and total lengths (millimeters).

Pre-treatment electrofishing was used to capture and mark rainbow trout in the North Fork, Little Snake River (NFLSR) downstream of the waterfall; pre-treatment removal of rainbow trout in the NFLSR by electrofishing upstream of the waterfall; channel cross-sections and longitudinal profile taken in the NFLSR; and for stream crossings, pre-treatment and post-treatment channel cross-sections and photographic documentation.

Results/Evaluation

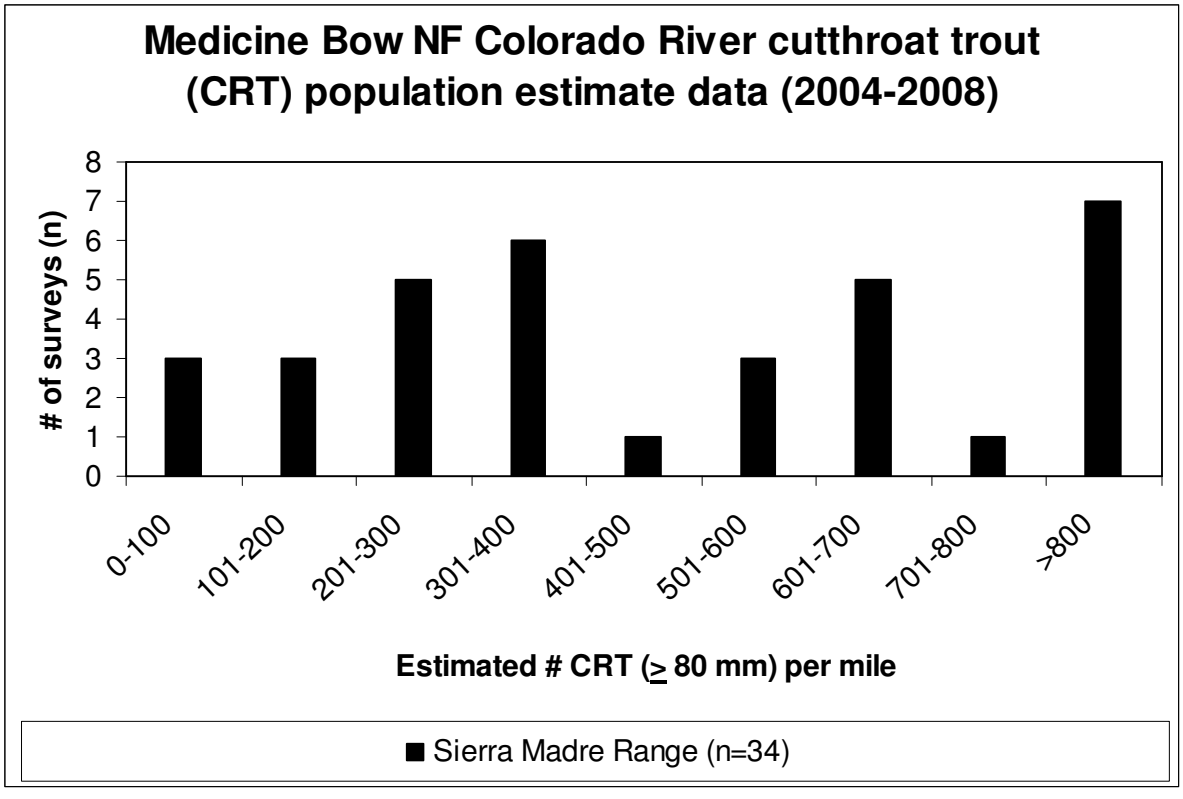


Figure 13. Medicine Bow NF Colorado River cutthroat trout population

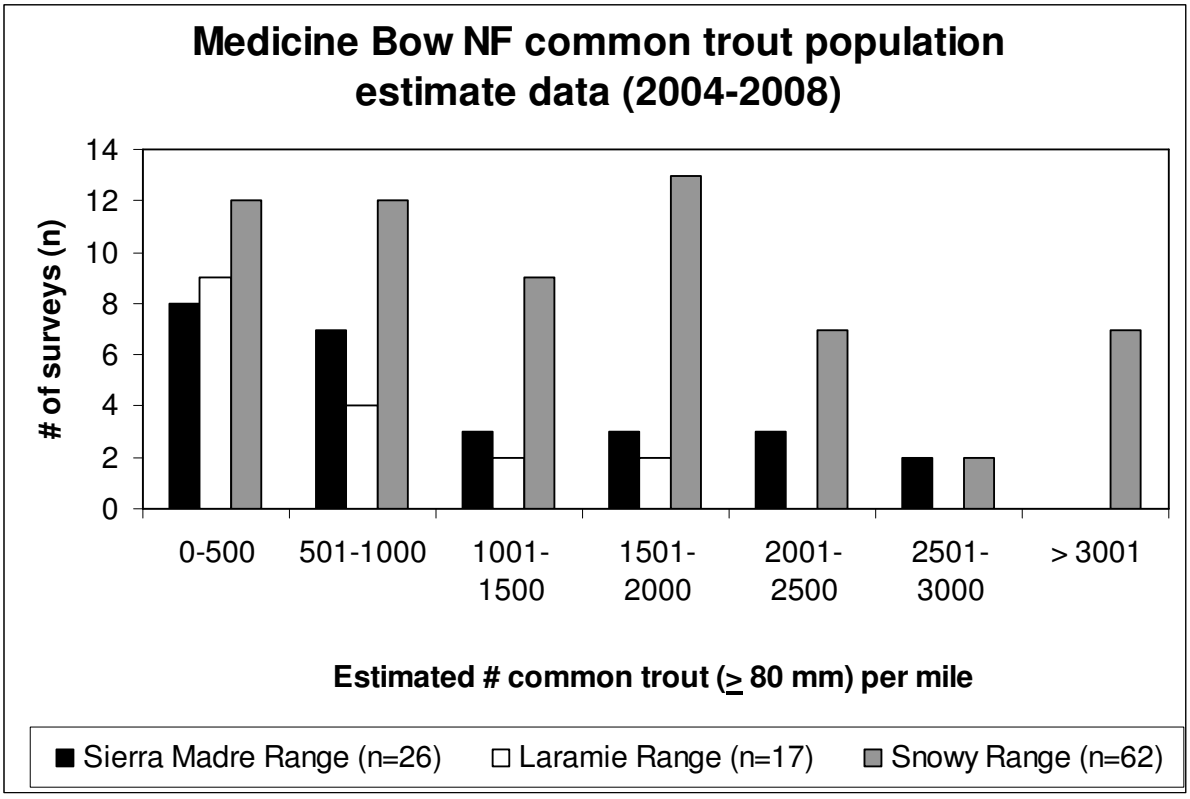


Figure 14. Medicine Bow NF common trout population

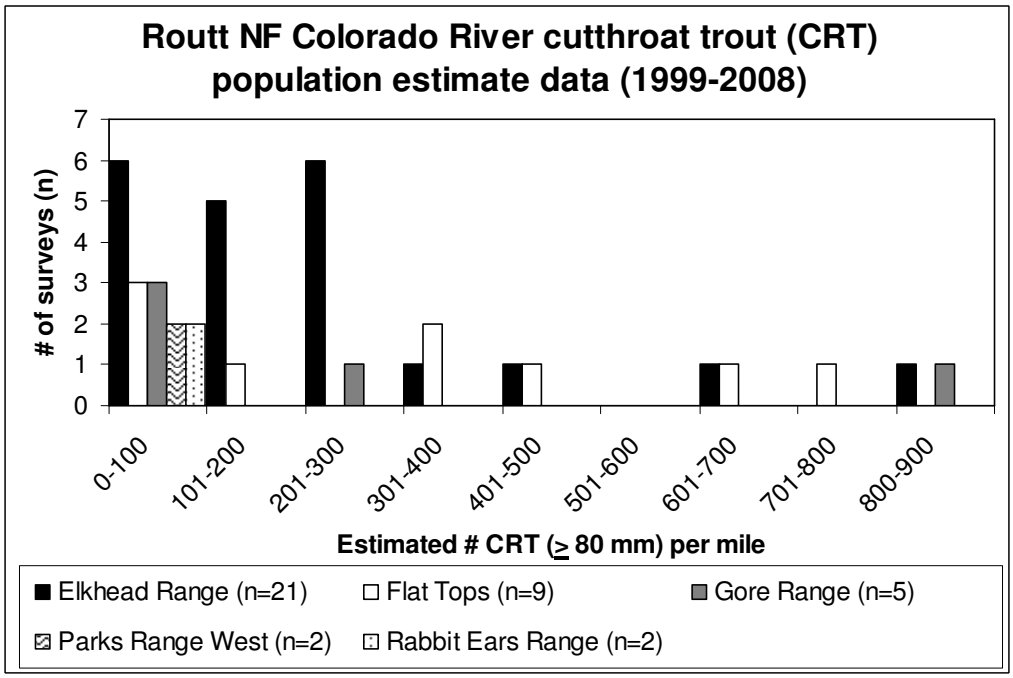


Figure 15. Colorado River cutthroat trout surveys conducted in the Routt National Forest, 1999-2008.

MBNF

Because very few repeat surveys were conducted to assess CRCT and MIS trout populations in the Medicine Bow National Forest during 2004-2008, the associations between population trends and habitat conditions cannot be made. What can be demonstrated, however, is the geographical extent of the sampling efforts during the past five years (Figures 13 and 14). During this reporting period (five years), habitats in every mountain range in the Medicine Bow National Forest were sampled, primarily for MIS trout. CRCT habitats located in the Sierra Madre, west of the Continental Divide were sampled, but less extensively than those of MIS trout; CRCT habitats are less abundant and widely distributed that are habitats that support MIS trout. Most CRCT and MIS trout populations appear to be either in stable condition or are expanding. As of 2008, all of the CRCT and MIS trout populations appear to be naturally-reproducing and self-sustaining ones.

RNF

Because only a few of the reaches sampled from 1999 to 2008 in the Routt National Forest were re-sampled, no reliable population-trend analyses are possible. The data do, however, indicate the geographic distribution of the population sampling efforts from 1999 to 2008. Every major mountain range in the Routt National Forest was sampled from 1999 to 2008. Based on the geographically-extensive surveys that have been conducted during the past decade, it appears that MIS trout and CRCT populations are, for the most part, naturally-reproducing and self-sustaining and stable (Figures 15 and 16). There are, however, CRCT populations that are believed to have been extirpated due to competitive exclusion by brook trout; Lost Dog Creek, in the Parks Range West, is an example.

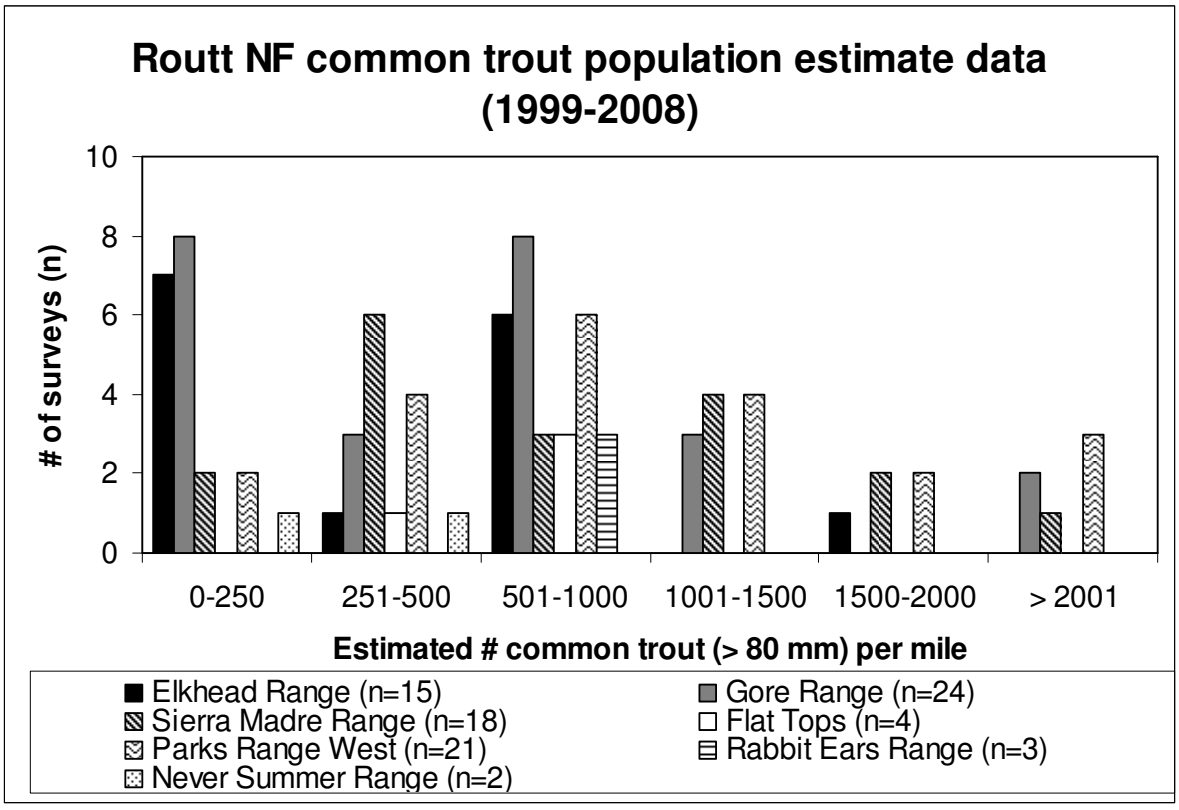


Figure 16. Routt NF common trout population

Conclusions
Based on the results from the past sampling (5 years on the MBNF, 10 years on the RTNF), MIS trout and CRCT in the MBR, it appears that, for the most part, populations and habitats are stable. CRCT habitats and populations continue to be at risk of degradation and extirpation due to multiple-use activities on public lands and development on private lands, respectively. It is essential that these populations and their associated habitats continue to be properly managed and monitored.

Amphibians

Monitoring Protocol/Data Collected: R2 Sensitive Amphibian Habitats and Populations

Visual, sinuous-transverse methods were used to observe and evaluate populations and habitats of R2 sensitive and other native amphibians. Habitat and population trend data are disclosed in the monitoring and evaluation report every five years. Surveys, however, are conducted annually. Also, because of the distribution of chytrid fungus in the MBR, annual sampling to detect the spread of chytrid fungus will continue. Tissue (skin or toenail) samples and skin swabs are submitted to a genetics laboratory (Pisces Molecular, LLC) for analysis.

Results/Evaluation

MBNF
Table 27 clearly indicates the disparities in relative abundance among the three R2 sensitive amphibians extant in the Medicine Bow National Forest. Wood frogs have been the most commonly observed sensitive amphibians in the in the Medicine Bow Mountains between 2004 and 2008. The Medicine Bow Mountains contain abundant kettle ponds which, among the habitat types that support wood frogs, appear to be preferred and productive habitat. Both the northern leopard frog and the boreal toad have experienced population declines in the Medicine Bows, although the northern leopard frog is much more abundant in the Laramie Range and in the Thunder Basin National Grassland. Boreal toads are in decline forestwide and the decline in populations and active-breeding sites has been precipitous the past three decades or so. Only three known boreal-toad breeding sites have been active in the past five years; the breeding sites are located in the vicinity of Ryan Park, Sourdough Creek, and the North Fork, Little Laramie River. Generally, northern leopard frog and wood frog populations appear to naturally-reproducing and self-sustaining in the Medicine Bow National Forest. By inference, amphibian habitats appear to be both available for and suitable to sustaining leopard frog and wood frog populations. The reasons for boreal toad population declines are ecologically complex and not well understood; this species was at one time commonly found in sympatry with other Forest amphibians. The presence of chytrid fungus in some Forest amphibian habitats likely plays a role in boreal toad declines.

Chytrid fungus is a deadly amphibian pathogen and it appears to persist in some amphibian habitats in the Forest. In FY07, nine tissue samples were submitted to Pisces Molecular LLC for polymerase chain reaction (PCR) assay to test for the presence of chytrid fungus (*Batrachochytrium dendrobatidis*). One sample, collected in the vicinity of Commissary Park (Sierra Madre, west of the Continental Divide) tested positive. No chytrid fungus samples were collected in FY08.

As mentioned in the FY2005 Annual Monitoring Report, the Medicine Bow/Routt National Forests conducted a boreal toad abundance and distribution study in cooperation with the Rocky Mountain Research Station during FY2004 and FY2005. A manuscript entitled, "Distribution of Boreal Toads (*Bufo boreas boreas*) and *Batrachochytrium dendrobatidis* in

South-Central Wyoming and North-Central Colorado", was accepted for publication in 2006 and published in the journal, ***Herpetelogical Review*** in 2007.

Table 27. R2 Sensitive amphibian observed in the MBNF, 2004-2008

Mountain Range	Species Observed	Total Numbers Observed	Number of records in NRIS Wildlife
Laramie	Northern Leopard frog	161	9
Medicine Bow	Wood Frog	7,797	31
Medicine Bow	Western Boreal Toad	60	15

RNF

Table 28 indicates a pattern of amphibian abundance in the Routt National Forest similar to that observed in the Medicine Bow National Forest. By far, wood frogs have been the most abundant amphibian observed in the Forest during the past decade. The Parks Ranger District has abundant kettle pond habitat in the southern terminus of the Medicine Bow Mountains and in the Parks Range, east (includes the Mount Zirkel wilderness). Interestingly, the Parks Ranger District has an abundance of northern leopard frog observations; the observations documented in the Parks R.D. are by far the most numerous from any ranger district in the combined Forest.

Table 28. R2 Sensitive amphibian observed in the RNF, 1999-2008*

Ranger District	Species Observed	Total Numbers Observed	Number of records in NRIS Wildlife
Yampa	Northern Leopard frog	5	5
Hahns Peak Bears Ears	Northern Leopard frog	50	20
Hahns Peak Bears Ears	Wood Frog	2	1
Parks	Northern Leopard frog	1,293	201
Parks	Wood Frog	20,919	446

Note: * The only amphibian surveys conducted in FY2008 were conducted by the south zone aquatics crew.

Table 29. Boreal toad breeding sites monitored in the Routt National Forest, 1999-2008*

Site Name	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Spike Lake	NA	NA	NA	NA	NA	A	T	NM	NM	NM	NM	NM	NM
Muddy Pass Lake	NA	NA	NA	NA	NA	NA	NA	NA	NA	A	A	NA	NM
First Creek**	A,S	A,S	S	NA	NA	NA	NM	NA	NM	NM	A	NA	NM
Soda Creek**	A,M	A,M	S	A	A	NA	NA	NA	NA	NA	NA	NA	NA
Diamond Park**	A,M	A,M	A	A	NA	NA	NA	NA	NM	NM	NM	NM	NA
Torso Creek	NA	NA	NA	A,S	A,M	A,S,M	A,S	A,M	A,S, M	A,S,M	S,M	S	NM

North Fk. Morrison Creek	NA	NA	NA	A,S, M	A,S, M	A,S,M	A,S	A	A	A,M	A,S,M	NA	A,S, M,T
Upper Buck Mountain	NA	NA	NA	NA	A,S, M	A,S,M	A,S	A,M	A,S, M	S,M	A,M	NA	A,S, M,T

A = adults; S = sub adults; T = tadpoles; and M = metamorphosed life stages (e.g. toadlets). NA = No activity observed; NM = Not monitored.
Note: * The only amphibian surveys conducted in FY2008 were conducted by the south zone aquatics crew.
Note: ** These sites were known breeding sites in the 1990s, but they have been inactive-breeding sites since 2000.

Table 29 indicates that there are many more known active and inactive boreal toad breeding sites in the Routt National Forest than in the Medicine Bow National Forest. Two breeding sites, Buck Mountain and North Fork, Morrison Creek, have been exceptionally productive sites during the past five years. Three other active-breeding sites in the Routt National Forest have been productive to some degree between 2000 and 2008. Overall, the Routt national Forest has the most abundant and productive boreal toad breeding sites Forestwide.

Conclusions

Among the three, R2 sensitive amphibians extant in the MBNF, the wood frog appears to be the most abundant in the Medicine Bow Mountains. Northern leopard frogs are faring well in the Laramie Range, but the species is much less abundant in the Medicine Bow Mountains. Boreal toad populations and active breeding sites are in precipitous decline, Forestwide and this trend is likely to persist.

With the exception of boreal toads, RNF amphibian populations and habitats appear to be abundant and well distributed. Amphibians are breeding and surviving in most of the riparian and wetland habitats on the Forest, especially in kettle-pond habitats. Reproduction and survival rates for the boreal toad appear to be relatively low in most of the active breeding sites based on survey results, although the actual rates are unknown. Low observations of egg masses, and in some cases tadpoles, are likely due to the timing of field surveys. Interestingly, boreal toad breeding activity appears to me much greater in the Routt National Forest than in the Medicine Bow National Forest.

INSECTS

Hudsonian Emerald: No surveys for this insect occurred in FY08.

MOLLUSKS

Rocky Mountain Capshell Snail: No surveys for this snail occurred in FY08.

AQUATIC THREATENED AND ENDANGERED SPECIES

Monitoring Protocol/Data Collected

Threatened and Endangered Species: No direct monitoring/evaluation protocol is applicable to these species.

Results/Evaluation

The Forest continues to comply with all of the requirements to consult with the U.S. Fish and Wildlife Service when projects that could deplete water from the upper-Colorado/Yampa River basins and the Platte River basin are proposed for implementation. Proposed projects that are not yet covered by programmatic Biological Opinions will undergo consultation.

Table 30. Colorado River and Platte River listed aquatic species.

Species	Scientific Name	River System	Federal Status
Bonytail	Gila elegans	Colorado	Endangered
Colorado Pikeminnow	Ptychocheilus lucius	Colorado	Endangered
Humpback Chub	Gila cypha	Colorado	Endangered
Pallid Sturgeon	Scaphirhynchus albus	Platte	Endangered
Razorback Sucker	Xyrauchen texanus	Colorado	Endangered

The federally-listed fish species found in Table 30 occur scores of miles downstream from the Forest boundaries. However, natural-resource management projects that occur within the Forest that could change the timing and/or magnitude of streamflow due to water depletions have been found to adversely affect habitats and populations of these species in the Colorado River, Platte River and Yampa River basins. In addition, in FY08 and in past years, there has been a concerted effort by Forest personnel to process Ditch Bill Easements pertinent to water-depletion facilities in the Platte, upper Colorado, and Yampa River basins.

Conclusion

There are no federally-listed, aquatic species or designated, critical aquatic habitats in the Medicine Bow-Routt National Forests. Given that the MBR continues to consult with the USFWS about proposed projects that could result in water depletions in the Forest, we conclude that the impacts to downstream populations and critical habitats of federally-listed fishes extant in the aforementioned basins are mitigated.

Recommendations

Continue to conduct annual, amphibian (R2 sensitive species) surveys in the MBR to collect data about species abundance, distribution, and reproduction. In addition, continue to monitor the active, boreal toad breeding sites for signs of successful reproduction and search for additional breeding sites. Continue to sample boreal toads for the presence of chytrid fungus as periodic sampling for chytrid fungus is necessary to monitor for the prevalence of this pathogen among amphibian populations. Finally, breeding sites that have been inactive for many years should be periodically monitored for signs of reproduction.

Implement the sampling protocol developed by the Medicine Bow National Forest and the University of Wyoming. Also, periodically conduct surveys to monitor habitats and populations of other R2 sensitive fishes present or thought to be present on the forests such as the horneyhead chub.

Medicine Bow Objective 1.b.5
Routt Monitoring Item 1-12 is:

These monitoring items ask the questions:

What is the relationship between changes in habitat and population trends of management indicator species?

To what extent are listed species, sensitive species and species of local concern and management indicator species habitat availability, habitat quality and populations maintaining stable or positive trends?

These monitoring items stem from **36 CFR 219.19**, which states in **(a)(6)** "Population trends of the management indicator species (MIS) will be monitored and relationships to habitat changes determined".

For the Routt National Forest, this monitoring question is limited to species classified as MIS.

For the Medicine Bow National Forest, potential monitoring items include: Survey data for T, E, MIS and priority sensitive species and species of local concern as well as habitat and population correlation modeling.

The LMRP's (as amended) clarify that for these monitoring questions, the reporting frequency is every 5 years. The expected precision and reliability is rated as a 'B'.

A 'B-Class' of reliability is defined as:

> These methods are based on project records, communications, on-site ocular estimates and less formal measurements such as pace transects, informal visitor surveys, aerial photo interpretation and other similar types of assessments. Reliability, accuracy, and precision are good but less than Class A. Class B methods are often qualitative but still provide valuable information on the status of the resource.

Listed Species

On the Medicine Bow National Forest, there are three terrestrial animal species that are (or were) listed as threatened species under the Endanger Species Act. These include the Canada lynx, the Preble's meadow jumping mouse and the bald eagle.

Canada lynx (Lynx canadensis)

The Canada lynx was listed as threatened on March 24, 2000 (Federal Register: March 24, 2000 [Volume 65, Number 58]). Information on species status and ecology of the Canada lynx was obtained from *Ecology and Conservation of Lynx in the United States* (Ruggerio *et al.* 1999), *The Canada Lynx Conservation Assessment and Strategy* (LCAS, Ruediger *et al.* 2000), and the *Southern Rockies Lynx Amendment* (SRLA; USDA Forest Service 2008).

The monitoring requirements related to Canada lynx are described in the Southern Rockies Lynx Amendment, which amended the Routt and Medicine Bow National Forests Land and Resource Management Plans. This monitoring is from project decisions from November 2008 to December 2009 and includes information for both the Routt and Medicine Bow National Forests:

The required monitoring items are quoted directly from the SRLA ROD as follows:

2. When fuels treatment and vegetation management project decisions are signed, report the following:

a) *Acres of fuel treatment in lynx habitat by Forest and LAU, and whether the treatment is within or outside the WUI as defined by HFRA.*

b) *Whether or not the fuel treatment met the vegetation standards or guidelines. If standard(s) were not met, report which standard(s) was not met, why it could not be met, and how many acres were affected.*

c) *Application of exceptions in Standard VEG S5:*

- *For areas where any of the exceptions 1 through 5 listed in Standard VEG S5 were applied, report the type of activity, the number of acres, and the location (by unit, and LAU) and whether or not Standard VEG S1 was within the allowance.*

d) *Application of exceptions in Standard VEG S6:*

- *For areas where any of the exceptions 1 through 4 listed in Standard VEG S6 were applied, report the type of activity, the number of acres, and the location (by unit, and LAU) and whether or not Standard VEG S1 was within the allowance.*

e) *Total acres of lynx habitat treated under exemptions and exceptions to vegetation standards, to assure the 4.5 percent limit is not exceeded on any Forest over the life of the amendment (15 years).*

3. Application of guidelines:

a) Summarize what guideline(s) was not followed and why.
b) Document the rationale for deviations to guidelines. (USDA Forest Service 2008)"

2a: During the reporting period, fuel treatment project decisions were signed that would affect a total of 392 acres of lynx habitat within the WUI on the Medicine Bow-Routt National Forests. This included: 205.84 acres on the Little Snake River LAU, 31.98 acres in the Sand Mountain LAU, 120.6 acres in the Green Mountain LAU, 3.9 acres in the Cedar Brush LAU and 29.6 acres in the NE Snowy Range LAU.

2b: Fuel treatments met all vegetation standards. Consistency with guidelines is discussed in 3a and 3b. It is recommended that consistency with guidelines be removed from 2b, since this information is also requested in 3a and 3b.

2c: Vegetation standard #5 utilized one exception (exception 5) for one project, the ***Coulton Creek Precommercial Thinning Project***. This project occurred on 170 acres in the Upper Elk River LAU. This LAU is considered in a greater than 30% unsuitable condition (outside of the threshold described in VEG S1). However, all criteria under exception 5 were utilized including 5b, which outlines constraints for this type of activity in LAU's with a greater than 30% lynx habitat in a currently unsuitable condition.

2d: Exceptions (1-4) to vegetation standard #6 were utilized on two projects during the reporting period. These projects include:

- ***Prospector Timber Sale and Fuel Reduction Project***
  - Activity: timber salvage and fuel reduction
  - Number of acres: 274.58 (Includes 257.3 acres applicable to exceptions 1-3 and 17.28 acres applicable to exception 4).
  - Location: Medicine Bow-Routt National Forest – Sand Mountain LAU
  - The LAU was considered in a less than 30% unsuitable condition.
- ***Carbon Power and Light Hazardous Tree Removal and Fuel Reduction Project***

- Activity: Hazardous fuel reduction
- Number of acres: 2.5 acres in the Green Mountain LAU and 0.7 acres in the Cedar/Brush LAU.
- Location: Medicine Bow-Routt National Forest – Green Mountain and Cedar/Brush LAU's
- The Green Mountain is in a greater than 30% unsuitable condition.
- The Cedar/Brush LAU is in a less than 30% unsuitable condition.

2e: For this reporting period, for projects with signed decisions, the total number of acres treated under exemptions and exceptions for the Medicine Bow-Routt National Forest are as follows:

- Fuel treatment exemptions:
  - Forest Allocation: 35,774 acres
  - Acres exempted: 278
  - Forest Allocation Balance: 35,496 acres
- Vegetation S5 & S6 exceptions in lynx habitat
  - Forest Allocation: 17,886 acres
  - Acres excepted : 430.5 (excluding use of veg S6 exception #4)
  - Forest Allocation Balance: 17,456 acres

3a&b: One project, Carbon Power and Light, was not consistent with guidelines VEG G10 and VEG G11 because implementing this direction would not allow for the achievement of the purpose and need of the project which was to remove hazardous fuels from underneath the power line.

Preble's meadow jumping mouse (Zapus hudsonius preblei)

The Preble's meadow jumping mouse was listed by the U.S. Fish and Wildlife Service as threatened species on May 13, 1998.

The Medicine Bow Routt National Forests initiated an administrative study of this species in 2004 in collaboration with the University of Wyoming's Wyoming Natural Diversity Database. This study was conducted from 2004-2009 the goal to inventory and monitor Preble's populations at fixed points, correlate population trends with general habitat characteristics, and measure population responses to fire and livestock grazing (Griscom et al. 2009). This project concluded that "monitoring of *Zapus* on fixed live-trapping transects on the Medicine Bow National Forest since 2005 have shown a stable or slightly increasing trend. This may, in part, be due to a lessening of drought conditions over the 5-year period" (Griscom et al. 2009).

In 2008 it was determined that the subspecies was sufficiently secure within the Wyoming portion of its range and the USFWS delisted *Zapus hudsonius preblei* within Wyoming on July 10, 2008 (USFWS 2008).

Bald eagle (Haliaeetus leucocephalus)

On August 9, 2007 the bald eagle was removed from the list of threatened and endangered species due to strong population recovery. The species population has been increasing and is now considered recovered. The US Fish and Wildlife is continuing to monitor this species with its post-delisting monitoring plan.

Sensitive Species

Sensitive species for Region 2 are listed on the Regional Forester's sensitive species list (http://www.fs.fed.us/r2/projects/scp/sensitivespecies/index.shtml) and are composed of plants, birds, mammals, amphibians, reptiles, fish, and invertebrates. Only terrestrial animal species are addressed in this section. Biological evaluations (BEs) are prepared for sensitive species and the objectives of these evaluations(FSM 2672.41) are:

1. To ensure that Forest Service actions do not contribute to loss of viability of any native or desired non-native plant or contribute to animal species or trends toward Federal listing of any species listed as sensitive by USDA Forest Service Region 2.
2. To comply with the requirements of the Endangered Species Act, actions of Federal agencies should not jeopardize or adversely modify critical habitat of federally listed species.
3. To provide a process and standard by which to ensure that threatened, endangered, proposed, and sensitive species receive full consideration in the decision making process, and to enhance opportunities for mitigation.

Numerous biological evaluations for sensitive species are prepared each year on the Medicine Bow and Routt National Forests. These evaluations document the current status of sensitive species on the Forests as well as the anticipated effects from proposed management actions to the species and its habitat.

Table 31. Biological Evaluations and Biological Assessments

Year	2004	2005	2006	2008
# BEBA's Completed	120	110	110	123
# of requests for Concurrence	9	26	26	12
# of requests for formal consultation	9	0	1	0

Additional reports specific to sensitive species conservation actions on the Medicine Bow and Routt National Forests can be found on the US Forest Service Wildlife, Fish and Rare Plants accomplishment reporting website (http://www.fs.fed.us/biology/managementsystem) under the TES section of the database.

Species of Local Concern: Medicine Bow National Forest

The Medicine Bow-National Forest has identified 26 species of local concern. Of these four species are terrestrial animals and addressed in this section. These include: pika, bighorn sheep, brown-capped rosy finch and the brown creeper.

The Medicine Bow Routt National Forest started an administrative study of the pika in 2009 This preliminary investigation found pika at a greater distribution including at lower elevational areas than originally anticipated (Topolowski and Dressen 2009).

The bighorn sheep was designated as a Regional Foresters Sensitive species in 2007. This species is now evaluated in biological evaluations with other sensitive species.

The brown-capped rosy finch and the brown creeper are monitored through the Monitoring Wyoming Birds Program in collaboration with the Rocky Mountain Bird Observatory and the Wyoming Natural Diversity Database. This monitoring program is described in detail in the landbird section for MIS monitoring. Additionally, a color banding project targeting the brown-capped rosy finch was developed on the White River national Forest and expanded

onto the Medicine Bow-Routt National Forests in 2010. The goal of this project is to supplement point transect monitoring during the breeding season with color-banding monitoring during the winter aggregations of this species at feeder locations. This project is described in Potter 2008.

Management Indicator Species: Medicine Bow and Routt National Forests

Region 2 of the Forest Service initiated a review of MIS in 2001 because of the concern that some species selected by Forests were not functioning appropriately as MIS (Hayward et al. 2001). The Medicine Bow-Routt National Forests reviewed and amended the MIS identified in the 1997 Routt National Forest LMRP. The Decision Notice for the amendment was signed in February 2007. The amendment and Decision Notice can be found on the Medicine Bow – Routt (MBR) website:

http://fs.usda.gov/goto/mbr/planning

This decision modified the number of MIS on the RTNF from twenty-four (24) to six species (including 2 fish species). This decision resulted in improved efficiency and effectiveness of monitoring and a closer link of species selected to management issues identified.

This decision revised the MIS list to include the following species: golden-crowned kinglet, northern goshawk, vesper sparrow, Wilson's warbler, Colorado River cutthroat trout, and brook trout. This modified MIS list is better aligned with the National Forest Management Act (NFMA) 1982 planning regulation, as clarified by Region 2 direction, and ensures that monitoring will be conducted on species for which monitoring population trend is most feasible and useful, and that monitoring is focused on major management issues that have the potential to affect species.

This decision did not change the monitoring and evaluation requirements that are outlined in chapter 4 of the LMRP. It does, however, change the description of how MIS monitoring would be conducted and the questions that the monitoring is intended to answer.

The 2007 decision specified that the Forest will develop MIS monitoring protocols that will outline how the monitoring will be conducted and that the protocols should be designed to determine the Forest population trend of MIS species and evaluate if changes to that trend are related to the major management issues facing the Forest.

On the RTNF, four issues and associated MIS were chosen to represent the major wildlife management issues and challenges currently facing the Forest to be evaluated through MIS monitoring.

- Spruce-fir timber management - Golden-crowned kinglet
- Lodgepole pine timber management - Northern goshawk
- Rangeland residual forage - Vesper sparrow
- Herbivory in riparian areas - Wilson's warbler

On the MBNF, seven issues and associated MIS were chosen to represent the major wildlife management issues and challenges currently facing the Forest to be evaluated through MIS monitoring.

- Old-growth - American marten and northern goshawk
- Dead down wood - American marten
- Snags - American three-toed woodpecker

- Spatial pattern-fragmentation (landscape scale) – American marten
- Ungulate herbivory in willow community – Wilson's warbler &Lincoln's sparrow
- TES - Snowshoe hare
- Within stand fragmentation - Golden-crowned kinglet

Table 32. Summary of MIS on the Medicine Bow and Routt National Forests.

Management Indicator Species	RTNF	MBNF
Northern goshawk	X	X
Golden-crowned kinglet	X	X
Wilson's warbler	X	X
Vesper sparrow	X	
Three toed-woodpecker		X
Lincoln's sparrow		X
American marten		X
Snowshoe hare		X

Northern Goshawk Monitoring (Accipiter gentilis)

Population Status: Monitoring of populations of the northern goshawk is accomplished through two approaches: 1) implementation of the National Goshawk Monitoring Protocol as designed for USFS Region 2 (Beck et al., in review) and 2) the MBR goshawk nesting territory monitoring protocol (Skorkowsky 2005).

This two tiered approach was developed because the biological population likely exists at the scale of a 'bio-region' as described in the northern goshawk inventory and monitoring technical guide (Woodbridge and Hargis 2006) and not at the scale of an individual National Forest. The MBR goshawk nesting protocol was developed to be responsive to the requirement outlined in 36 CFR 219.19, which requires population monitoring at the scale of the planning unit. The broad-scale population monitoring can be very useful in clarifying if population changes at the level of the planning unit are affected by local management, or broader-scale issues affecting populations (ex. regional weather events). The National Goshawk Monitoring Protocol is available at the following link:

http://www.fs.fed.us/rm/pubs_other/wo_gtr071.pdf.

The Rocky Mountain Region of the US Forest Service implemented the National Goshawk Monitoring Protocol in 2006 and again in 2009 (note: both years of sampling included surveying sampling units on the Medicine Bow and Routt National Forests). This protocol is designed to be implemented every 3 to 5 years and determine regional goshawk occupancy rates and allow for determining trend in occupancy rates. Occupancy rates are determined as an overall value (across all areas surveyed) as well as within strata classified as primary habitat (pine and aspen forest types) as well as secondary habitat (other forested vegetation types – mostly spruce/fir forest types).

Table 33. Results of implementation of the National Goshawk Monitoring Protocol in R2.

Year of Implementation	2006	2009
Overall Occupancy Rate (95% Confidence Interval)	33% (21-45%)	47% (36-59%)
Occupancy Rate in Primary Habitat (Standard Error)	81% (SE 0.113)	84% (SE 0.079)
Occupancy Rate in Secondary Habitat (Standard Error)	12% (SE 0.067)	32% (SE 0.182)
Sample Size	51	109

The survey found an overall increase in occupancy rates (sample units with goshawks detected as adjusted by the detection probability) between 2006 and 2009. This rate did not change significantly in the primary habitat type but did increase significantly in the secondary habitat type. The Rocky Mountain Region is planning to complete an environmental correlates analysis to evaluate factors that may be influencing this population change. One hypothesis that was presented to explain this population change is that there may be a shift in occupancy rates between primary and secondary habitats due to declining quality and availability of primary habitat, due to the bark beetle epidemic (Skorkowsky 2009). The increase in occupancy in secondary habitats may be an indication of this shift beginning to occur. Occupancy rates holding steady in the primary habitat is anticipated to be a result of the high territoriality of goshawks, this is anticipated to decline as these stands begin to fall apart and prey populations decline (Skorkowsky 2009). Monitoring information with this program is currently limited to estimates from only two different years of data (2006 & 2009), thus caution is advised in the interpretation of population trend information. Increased occupancy rates may not reflect an increasing population, but, given the widespread pine mortality, could be a result of increasing explorations of goshawks from nesting sites with declining habitat quality or increasing home ranges due to declines in prey abundance.

The Medicine Bow and Routt National Forest northern goshawk territory monitoring protocol reflects a stable trend in goshawk activity and occupancy rates.

Table 34. Routt National Forest Goshawk Territory Monitoring 1993-2008

	Nesting Activity					Nest Success						
YEAR	Active	Inactive	Occupied	Unknown	Unsuitable	Successful	Failed	Unknown	Total # of Territories	Total # of Functional Territories	% Occupied	% Active
1993	5	5	2	3		3		2	15	15	58.3%	41.7%
1994	4	7	2	4		2		2	17	17	46.2%	30.8%
1995	5	6	4	4	1		1	4	20	19	60.0%	33.3%
1996	10	15	1	2	1	9		1	29	28	42.3%	38.5%
1997	9	17	2	4	1	7		2	33	32	39.3%	32.1%
1998	6	15	3	10	1	5	1		35	34	37.5%	25.0%
1999	5	17	5	8	1	3	1	1	36	35	37.0%	18.5%
2000	11	20	3	7	1	9		2	42	41	41.2%	32.4%

	Nesting Activity					Nest Success						
YEAR	Active	Inactive	Occupied	Unknown	Unsuitable	Successful	Failed	Unknown	Total # of Territories	Total # of Functional Territories	% Occupied	% Active
2001	7	25	5	4	1	3		4	42	41	32.4%	18.9%
2002	12	19	5	8	1	10		2	45	44	47.2%	33.3%
2003	9	24	1	11	2	7		2	47	45	29.4%	26.5%
2004	13	19	5	15	2	9	1	3	54	52	48.6%	35.1%
2005	12	16	4	17	3	7	3	2	49	46	55.2%	41.4%
2006	12	15	1	14	6	3	3	6	48	42	46.4%	42.9%
2007	18	18	3	8	6	10	3	5	53	47	53.8%	46.2%
2008	5	27	3	14	6	4	1	0	55	49	23.0%	14.3%

Table 35. Medicine Bow National Forest Goshawk Territory Monitoring 2006-2008

	Nesting Activity					Nest Success						
YEAR	Active	Inactive	Occupied	Unknown	Unsuitable	Successful	Failed	Unknown	Total # of Territories	Total # of Functional Territories	% Occupied	% Active
2006	12	11	3	18	2	6	2	5	46	44	57.7%	46.2%
2007	13	11	0	21	2	3	0	10	47	45	54.2%	54.2%
2008	13	14	0	18	2	8	2	3	47	45	48.1%	48.1%

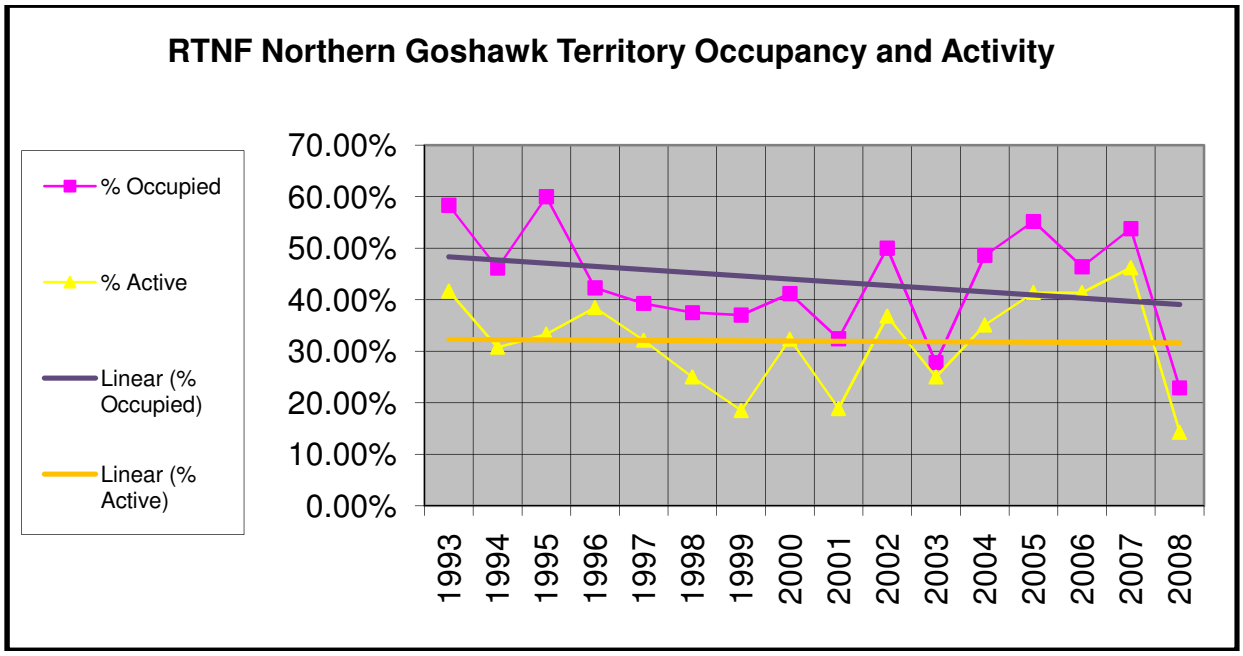


Figure 17. Annual territory occupancy and activity level for the RTNF

Annual fluctuations in territory activity and occupancy rates often occur across the western United States. Many of the increasing or declining years of territory occupancy or activity are extraordinarily correlated across very broad geographic areas. For example: most of the annual fluctuations on the Routt National Forest are synonymous with the fluctuations on the Kaibab National Forest in Arizona (personal communications with Dr. Richard Reynolds). Thus caution is advised in interpretation of annual variation in goshawk territory occupancy or activity.

In summary, during the monitoring period, goshawk populations have been relatively stable at the scale of the National Forests as well as at the scale of the Region. This however is anticipated to change considerably as a result of the mountain pine beetle epidemic (Skorkowsky 2009). Given that lodgepole pine is considered a primary habitat type for the northern goshawk and that most of the lodgepole pine on the Routt and Medicine Bow National Forests is anticipated to be impacted by the mountain pine beetle. The availability of suitable primary goshawk nesting habitat will be reduced (Skorkowsky 2009). The question that remains is if this will result in a population decline or perhaps a population redistribution of goshawks to secondary habitats, as is possibly indicated in the Region 2 monitoring data.

On the RTNF, the northern goshawk was identified as the MIS species best suited to assist in evaluating this management issue related to lodgepole pine timber management and the specific question:

- Is the rate, distribution, and approaches to timber management in the lodgepole pine affecting the ability of species utilizing those habitats to retain adequate distribution and abundance?

On the MBNF, the northern goshawk was identified as the MIS species best suited to assist in evaluating this management issue related to old-growth lodgepole pine and aspen and the specific question:

- Is the amount and distribution of old growth being left adequate for maintaining viable populations of species requiring old growth or old growth components?

Population trends of this species have been relatively stable during this monitoring period, indicating that lodgepole pine timber management approaches(RTNF) and the amount and distribution of old growth (MBNF) ion the Routt and Medicine Bow National Forests have been adequate at maintaining goshawk populations.

However, timber management approaches are currently rapidly changing from live tree harvest to broad-scale salvage harvest in response to the bark beetle epidemic. Additionally, most of the old-growth lodgepole pine on the MBNF is projected to be killed during the current bark beetle epidemic.

Northern goshawks will utilize old growth lodgepole pine, however the species does not depend on it exclusively and will utilize a variety of mature forest types (Kennedy 2003). Northern goshawks occur in deciduous hardwood forests of the northeastern United States and ponderosa pine, lodgepole pine, aspen and spruce-fir forest types in the Rocky Mountains of western United States. On the MBNF, goshawks utilize mostly mature lodgepole pine, but on other forests such as the Rio Grande, where pine is limited, goshawks use spruce-fir or aspen forest types.

Recommendation: Given the extensive pine mortality and the shift in management from live tree harvest to salvage harvest in the lodgepole pine type, consider if additional direction is needed to ensure that future forests will again provide high quality habitat for the northern goshawk.

Landbird Monitoring

Management Indicator Species included in the landbird monitoring program include the golden-crowned kinglet (RTNF & MBNF), Wilson's warbler (RTNF & MBNF), vesper sparrow (RTNF), American three-toed woodpecker (MBNF) and the Lincoln's sparrow (MBNF).

These bird populations are monitored annually as part of the Monitoring Wyoming Birds and Monitoring Colorado Birds monitoring programs. These programs were integrated in 2008 and 2009 and are now an aspect of the Integrated Monitoring in Bird Conservation Regions (IMBCR) monitoring program (Skorkowsky et al., in prep). The Medicine Bow-Routt National Forests have been supplementing this broad-scale monitoring program to bolster the sample size and allow for population estimation at the scale of the individual management units.

The IMBCR monitoring program uses a hierarchical approach that at its broadest extent can achieve the goal of Bird Conservation Region-wide monitoring (e.g. BCR 16). Each BCR is then divided into smaller portions by the state boundaries (e.g. the Wyoming or Colorado portion of BCR 16) and finally within a states portion of a BCR the area is divided into strata (e.g. Medicine Bow National Forest is a stratum that largely occurs within the Wyoming portion of BCR16 and the Routt National Forest is a stratum that occurs within the Colorado portion of BCR 16). This hierarchical approach is key in allowing for collected information to have relevance at a variety of spatial scales. Furthermore, this scalable design allows for targeted over sampling on individual strata (management units) within the sampling framework in order to achieve stratum level population estimates (Skorkowsky et al., in prep).

These monitoring programs have been accomplished in partnership with the Rocky Mountain Bird Observatory and the Wyoming Natural Diversity Database at the University of Wyoming. Information at the state-level for Colorado and Wyoming is summarized in reports prepared by the Rocky Mountain Bird Observatory. For the period before the integration of these

programs into the IMBCR program, the scale of the state provided a broad-scale context that local population trends could be compared to.

In Colorado, the 2007 report (Beason et al. 2007) summarizes 10 years of landbird population monitoring.

- http://www.rmbo.org/public/monitoring/PDF_Reports/MCB07_FinalV1_3_26.pdf
- Years included 1998-2007

The 2008 data for Colorado is presented in the following report (Blakesley and Hanni 2009). This data is included in a separate report because of the monitoring program design change.

- http://www.rmbo.org/public/monitoring/PDF_Reports/MCB_Report_2008_FINAL_v4.pdf

The Monitoring Wyoming Birds report (Rehm-Lorber et al. 2010) is included at the following link:

- http://www.rmbo.org/public/monitoring/PDF_Reports/MWB_Final_Report_2008.pdf
- Years included are 2002-2008

Two additional reports were prepared in 2008 specific to landbird species classified as MIS on the Medicine Bow and Routt National Forests.

- Population Densities and Trend Detection of Avian Management Indicator Species on the Routt National Forest (Blakesley 2008a).
- Population Densities of Avian Management Indicator Species on the Medicine Bow National Forest (Blakesley 2008b).

Golden-Crowned Kinglet (*Regulus satrapa*)

Population Status: Golden-crowned kinglets are permanent residents on the Medicine Bow and Routt National Forest and use spruce/fir habitats within the area at all times of year. The golden-crowned kinglet is not designated on any Federal, State, or USDA Forest Service species conservation lists. This species is widely distributed with breeding occurrences from southern Alaska to Newfoundland southward to central California, southern Utah, southeastern Arizona, southern New Mexico, northern Wisconsin, northern Ohio, New York and Tennessee, to the mountains of Mexico and western Guatemala. This kinglet has centers of abundance in the northwest and southeast United States with its highest density in the western part of the range and is among the most abundant bird species in studies in Oregon and Washington (USDA Forest Service 2005). Nation-wide there appears to be some decline on the west coast (2.7 percent annual for 1966-1994) with a concomitant increase in the east (6.1 percent per year for the same period) (USDA Forest Service 2005).

In Region 2 (USDA Forest Service), the golden-crowned kinglet is widely distributed in coniferous forests and is a year round resident across most of the region (USDA Forest Service 2005). Atlas data show that Colorado golden-crowned kinglets, although never abundant, occur mostly west of the Continental Divide (Kingery 1998). Kinglet numbers vary from year to year, and in some localities they become exceedingly rare for an entire breeding season (Kingery 1998).

Skorkowsky (2003) conducted a Master's thesis study on "The Effects of Blowdown and Subsequent Salvage Logging on Forest Songbird Populations." This monitoring effort provided quantitative data for densities of songbirds inhabiting the spruce/fir cover types. The golden-crowned kinglet is one of these avian species. During the time surveys were conducted, between 1999 and 2001, golden-crowned kinglet densities were estimated to be 0.08 birds/ha

(ha = hectare = 2.5 acres) in the blowdown areas, 0.03 birds/ha in the salvage logged areas, and 1.45 birds/ha in the mature spruce/fir cover type. On the Routt National Forest, there are approximately 254,000 acres of mature spruce/fir (USDA Forest Service 1998). Based on densities of golden-crowned kinglets found in the spruce-fir cover type during the survey period, the population density of this species may be estimated at roughly 147,320 territorial pairs (or 294,640 total) occupying the Routt National Forest. Additionally, this research has further demonstrated the preferred habitat of the golden-crowned kinglet.

Table 36. Estimated densities of golden-crowned kinglets in spruce-fir cover type throughout Colorado, 1998-2007, and within the RTNF, 2005-2007.

	Colorado					Routt National Forest Planning Area				
Year	**D**	**LCL**	**UCL**	**%CV**	**n**	**D**	**LCL**	**UCL**	**%CV**	**n**
1998	44	32	60	19	83					
1999	28	17	48	32	43					
2000	75	52	107	22	88					
2001	46	25	86	38	35					
2002	12	5.4	26	49	27					
2004	60	27	133	50	26					
2005	24	14	40	32	45	33	17	67	39	15
2006	34	18	64	39	47	43	22	83	39	26
2007	26	14	46	36	74	58	35	94	28	29

D = estimated density (birds/km^2); *LCL* and *UCL* = lower and upper 90% confidence limits on *D*; *%CV* = percent coefficient of variation of *D*; *n* = number of observations used to estimate *D*.

Table 37. Golden-crowned kinglet unadjusted counts for the RTNF (all cover types) 1998-2008

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
GCKI Relative Abundance	0.013	0.031	0.103	0.006	0.081	0.015	0.015	0.038	0.043	0.100	0.013
GCKI Count Data	1	6	22	1	17	2	3	21	27	58	3
Effort	75	195	213	180	210	135	197	560	621	579	239

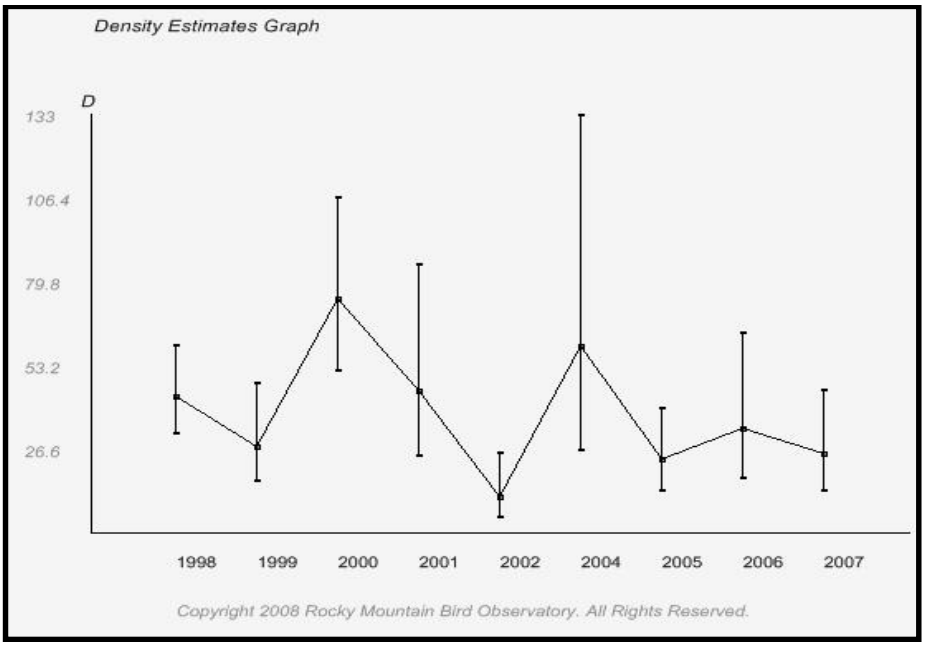


Figure 18. Estimated densities of golden-crowned Kinglets in spruce-fir habitat throughout Colorado (MCB), 1998-2007. Densities are in number of birds/km^2.

The data for the golden-crowned kinglet for the MBNF is presented in tables 38 and 39.

Table 38. Estimated densities of golden-crowned kinglets in spruce-fir habitat on the MBNF, 2005-2007 (Blakesley 2008b)

	Medicine Bow National Forest				
Year	D	LCL	UCL	%CV	n
2005	78	40	152	39	12
2006	158	93	271	31	31
2007	221	136	358	28	40

D = estimated density (birds/km^2); *LCL* and *UCL* = lower and upper 90% confidence limits on *D*; *%CV* = percent coefficient of variation of *D*; *n* = number of observations used to estimate *D*.

Table 39. Golden-crowned kinglet unadjusted counts for the MBNF 2004-2008

Year	2004	2005	2006	2007	2008
Effort (# points surveyed)	215	657	631	617	651
GCKI (# birds observed)	5	40	77	115	7
GCKI Relative Abundance	0.023256	0.060883	0.122029	0.186386	0.010753

In summary, during the monitoring period, GCKI appeared to have a relatively stable population at the scale of the state of Colorado for the spruce-fir cover type and that density estimates for the GCKI were similar on the Routt National Forest but considerably higher on the Medicine Bow National Forest.

On the RTNF, the golden-crowned kinglet was identified as the MIS species best suited to assist in evaluating this management issue related to spruce-fir timber management and the specific question:

- Is timber management in the spruce-fir forest changing the forest stands in such a way (within stand fragmentation and canopy openings) that species associated to spruce-fir forests are affected? What are the effects of timber cuts that affect canopy reduction (e.g. individual tree-mark) in spruce-fir to species distribution and abundance?

On the MBNF, the golden-crowned kinglet was identified as the MIS species best suited to assist in evaluating this management issue related to within stand fragmentation in the spruce-fir:

- Are treatments that create density or pattern gaps within a stand unlike that created by natural processes used by animals (thinning, group selection in continuous old spruce/fir)?

Population trends of this species have been relatively stable, given that the species is known to have quite dramatic local population density shifts (Kingery 1998). This relatively stable population indicates that management approaches implemented on the Routt and Medicine Bow National Forests have been adequate at maintaining golden-crowned kinglet populations.

Vesper Sparrow (Poocetes gramineus)

Population Status: Vesper sparrows are primarily summer residents on the Routt National Forest and use grass/forb habitats within or near the Forest for breeding. The 2008 report (Blakesley 2008a) concluded that density estimates of Vesper sparrows (VESP) in Sage/Mountain Meadow habitat were slightly lower on the Routt NF than state wide for 2005-2007, although 90% confidence intervals of the two samples overlapped in two of the 3 years.

Table 40. Estimated densities of VESP in sage/mountain meadow habitat throughout Colorado, 1999-2007, and within the Routt National Forest, 2005-2007 (Blakesley 2008a).

	Colorado						Routt National Forest Planning Area				
Year	D	LCL	UCL	%CV	n		D	LCL	UCL	%CV	n
1999	16	10	26	30	145						
2000	37	21	64	34	210						
2001	19	13	30	26	172						
2002	21	14	33	26	175						
2003	29	20	43	24	153						
2004	22	16	31	20	179						
2005	40	28	57	21	231		12	4	32	59	26
2006							13	6	29	46	40
2007	47	30	74	28	346		24	12	46	39	59

D = estimated density (birds/km^2); *LCL* and *UCL* = lower and upper 90% confidence limits on *D*; *%CV* = percent coefficient of variation of *D*; *n* = number of observations used to estimate *D*.

Table 41. VESP density for Colorado and the RTNF from 2008 (Blakesley and Hanni 2009).

	State of Colorado						Routt National Forest		
Species	D	N	SE	%CV	90% CI (lower)	90% CI (High)	n	D	%CV
VESP	0.46	120906	50346	42	55216	264746	7	0.37	49

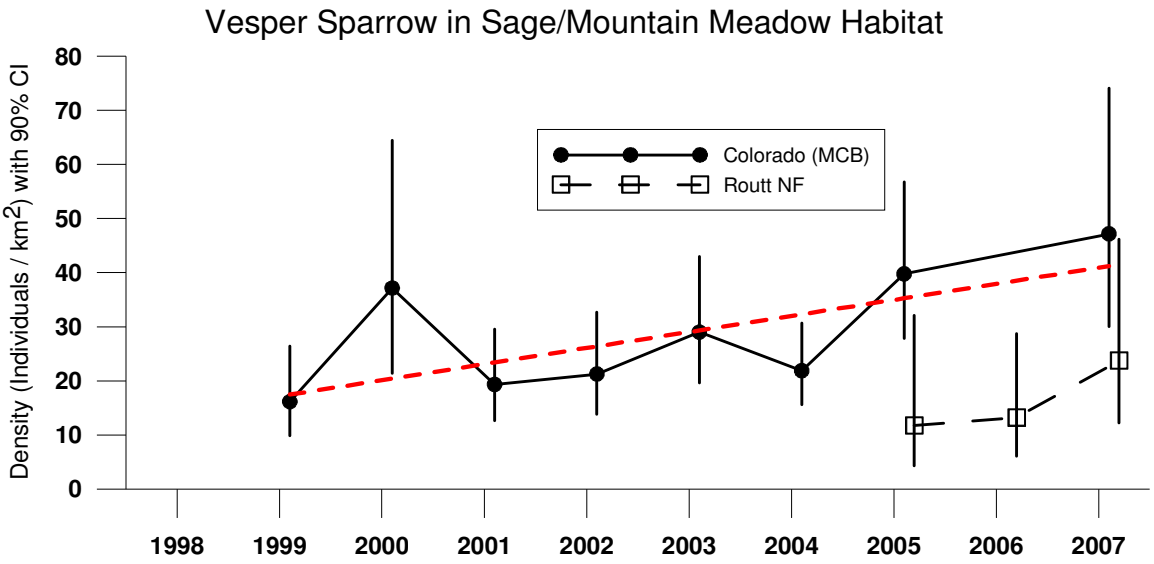


Figure 19. Estimated densities of VESP in sage/mountain meadow habitat throughout Colorado (MCB), 1999-2007, and within the RTNF, 2005-2007. Error bars represent 90% confidence intervals. The red (dashed) line represents the best estimate of observed population trend.

Table 42. Vesper sparrow unadjusted counts for the RTNF (all cover types) 1998-2008

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Effort (# points sampled)	75	195	213	180	210	135	197	560	621	579	239
VESP (# birds observed)	0	10	13	7	20	10	22	33	57	84	9
VESP Relative Abundance	0.000	0.051	0.061	0.039	0.095	0.074	0.112	0.059	0.092	0.145	0.038

On the RTNF, the vesper sparrow was identified as the MIS species best suited to assist in evaluating this management issue related to rangeland residual forage and the specific question:

- Is adequate residual forage being retained for native species?

Livestock and wild ungulate grazing affects several habitat types, particularly mountain parks and aspen forests. Residual grass and forbs are important as food and cover for many species using rangeland habitats. Species affected include invertebrates, birds, small mammals, as well as several native predators that feed on the birds and small mammals that are associated

with these communities. Retaining insufficient residual forage could affect several rangeland-associated species. Monitoring residual forage is an ongoing activity in the management of rangelands and using the vesper sparrow as an MIS compliments the evaluation of if residual forage direction in the Forest Plan is adequate.

Population trends of this species have historically been relatively stable to slightly increasing, indicating that management approaches implemented on the Routt National Forest has been adequate at maintaining vesper sparrow populations.

Wilson's Warbler (Wilsonia pusilla)

The Wilson's warbler (WIWA) was selected as an MIS to represent issues associated with ungulate herbivory, particularly of willows, in riparian areas. Wilson's warblers are summer residents on the Medicine Bow and Routt National Forests and use riparian/wetland habitats, particularly those at higher elevations, during their breeding season from about late May to mid-August. Grazing in high elevation riparian areas and degradation of willow shrub riparian systems may adversely affect this species.

Population Status: Analysis was completed in 2008 evaluating this species population trend on the Routt and Medicine Bow National Forests to the population trends at the scale of the states of Colorado and Wyoming, respectively (Blakesley 2008a and 2008b).

Routt National Forest: Density of Wilson's Warblers in high-elevation riparian habitat of the Routt NF appeared to be higher than state-wide estimates in 2005, but were similar to state-wide estimates in 2006-2007, based on overlapping 90% confidence intervals.

Table 43. Estimated densities of Wilson's warblers in high elevation riparian habitat throughout Colorado, 1999-2007, and within the Routt National Forest, 2005-2007.

	Colorado					Routt National Forest Planning Area				
Year	D	LCL	UCL	%CV	n	D	LCL	UCL	%CV	n
1999	48	20	112	53	20					
2000	110	62	196	36	59					
2001	172	101	293	33	96					
2002	222	122	402	37	105					
2004	295	173	503	33	174					
2005	183	115	291	29	108	492	336	721	23	138
2006	138	85	226	30	78	265	184	383	22	64
2007	218	130	365	32	126	273	159	468	32	75

D = estimated density (birds/km^2); *LCL* and *UCL* = lower and upper 90% confidence limits on *D*; *%CV* = percent coefficient of variation of *D*; *n* = number of observations used to estimate *D*.

Table 44. Wilson's warbler unadjusted counts for the RTNF (all cover types) 1998-2008

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Effort (# points sampled)	75	195	213	180	210	135	197	560	621	579	239
WIWA (# birds observed)	6	6	5	2	24	19	22	164	96	128	10
WIWA Relative Abundance	0.08	0.031	0.023	0.011	0.114	0.141	0.112	0.293	0.155	0.221	0.042

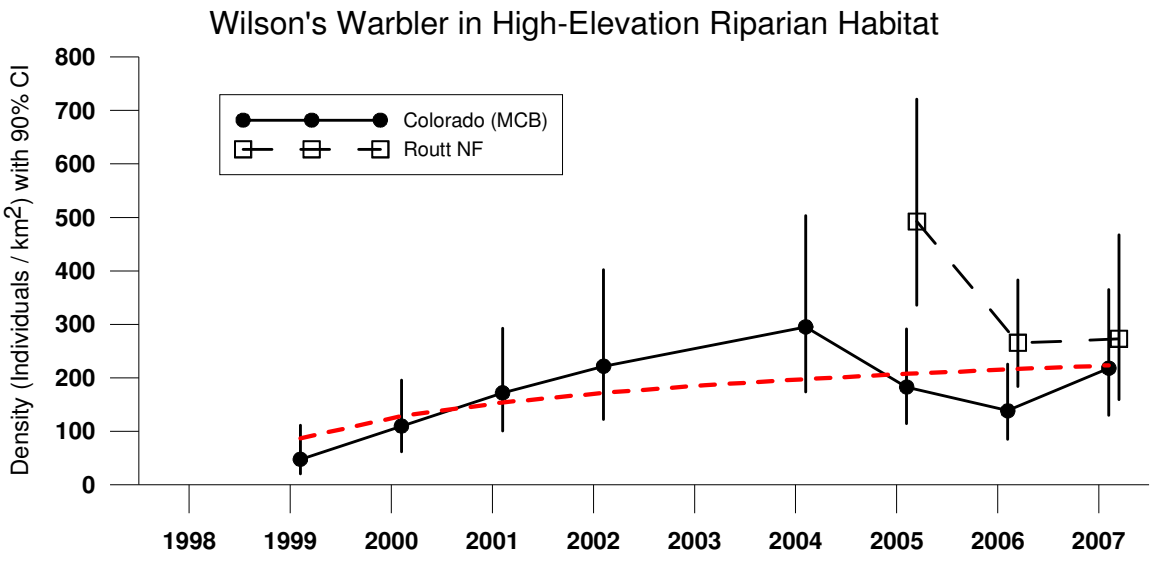


Figure 20. Estimated densities of Wilson's warblers in high elevation riparian habitat throughout Colorado (MCB), 1999-2007, and within the Routt National Forest, 2005-2007. Error bars represent 90% confidence intervals. The red (dashed) line represents the best estimate of observed population trend for the MCB data (Blakesley 2008a).

Medicine Bow National Forest: Five hundred forty-six of 561 Wilson's warblers detected on the Medicine Bow National Forest occurred in montane riparian habitat. Estimated density of Wilson's warblers in montane riparian habitat of the MBNF was similar to state-wide (MWB) estimates in 2005 but was much higher in 2006 and 2007 (Table 45).

Table 45. Estimated densities of Wilson's warblers in montane riparian habitat throughout Wyoming and on the Medicine Bow National Forest, 2002-2007 (Blakesley 2008b).

	Wyoming					Medicine Bow National Forest				
Year	D	LCL	UCL	%CV	n	D	LCL	UCL	%CV	n
2002	60	32	112	38	82	40	7	225	99	17
2003	37	24	57	26	60	40	19	85	40	17
2004	48	29	78	29	64	41	23	76	33	16
2005	101	57	179	34	77	126	77	206	29	128
2006	25	14	44	36	53	226	134	382	32	166
2007	5	3	9	37	36	89	54	145	29	105

D = estimated density (birds/km^2); *LCL* and *UCL* = lower and upper 90% confidence limits on *D*; *%CV* = percent coefficient of variation of *D*; *n* = number of observations used to estimate *D*.

Table 46. Wilsons warbler unadjusted counts for the MBNF (all cover types) 1998-2008

Year	2004	2005	2006	2007	2008
Effort (# points surveyed)	215	657	631	617	651
WIWA (# birds observed)	27	163	196	183	39
WIWA Relative Abundance	0.125581	0.248097	0.310618	0.296596	0.059908

The Wilson's warbler was identified as the MIS species best suited to assist in evaluating this management issue related to ungulate herbivory in willow riparian areas and the specific questions:

- **RTNF**: How is livestock and wild ungulate herbivory in riparian areas influencing the habitats of riparian dependant species?
- **MBNF**: Are we leaving enough shrubs in the riparian zones? Are riparian-dependent species changing in abundance with on-going grazing and the introduction of moose?

Herbivory from livestock, as well as wild ungulates, affects riparian vegetation. If not managed properly, herbivory by domestic livestock and wildlife affects streams and can adversely impact the stream bank, leading to long-term changes in stream and associated riparian systems. Herbivory effects on riparian and stream systems have been identified as a problem in local areas on the Forest but have not been identified broadly.

Population trends of this species have historically been relatively stable to slightly increasing and annual density estimates on the RTNF and MBNF tend to are similar to state level estimates and fluctuate similarly to the annual variation at the state level. This information indicates that management approaches implemented in the Routt and Medicine Bow National Forests have been adequate at maintaining Wilson's warbler populations.

Lincoln's Sparrow (Melospiza lincolnii):

Population Status: Analysis was completed in 2008 evaluating the population data for Lincoln's sparrow (LISP) on the Medicine Bow National Forest (Blakesley 2008b).

Of 1173 Lincoln's sparrows detected on the Medicine Bow National Forest, 941 occurred in montane riparian and 140 in aspen habitats. The remaining detections were evenly spread between mid-elevation conifer (27), spruce-fir (39), and randomly placed transects (26); sample sizes within these strata were too small for density estimation (Blakesley 2008b).

Estimated densities of Lincoln's sparrows in aspen habitat were higher than state-wide (MWB) estimates. However, 90% confidence intervals of the MBNF and MWB estimates overlapped, due to the small sample sizes (and consequently large coefficients of variation) of the MBNF data (Table 47). Estimated density of Lincoln's sparrows in montane riparian habitat was much higher on the MBNF than state-wide in 2005-2007 (Blakesley 2008b).

Table 47. Estimated densities of Lincoln's sparrows in aspen habitat throughout Wyoming and on the Medicine Bow National Forest, 2002-2007 (Blakesley 2008b)

	Wyoming						Medicine Bow National Forest				
Year	D	LCL	UCL	%CV	n		D	LCL	UCL	%CV	n
2002	2	1	7	83	5						0
2003	7	4	13	36	19						4
2004	13	8	23	33	31						12
2005	27	15	49	37	69		52	20	138	64	44
2006	17	9	32	38	49		35	14	90	62	23
2007	31	19	50	30	80		49	18	131	65	36

D = estimated density (birds/km2); LCL and UCL = lower and upper 90% confidence limits on D; %CV = percent coefficient of variation of D; n = number of observations used to estimate D.

Table 48. Estimated densities of Lincoln's sparrows in montane riparian habitat throughout Wyoming and on the Medicine Bow National Forest, 2002-2007 (Blakesley 2008b)

	Wyoming						Medicine Bow National Forest				
Year	D	LCL	UCL	%CV	n		D	LCL	UCL	%CV	n
2002	109	40	300	67	116		210	83	529	56	39
2003	40	22	71	36	103		102	42	248	54	19
2004	67	42	108	28	155		280	93	843	66	42
2005	19	9	39	46	109		119	65	218	38	167
2006	39	26	58	24	189		714	478	1067	24	266
2007	22	16	32	22	178		330	203	536	29	231

D = estimated density (birds/km2); LCL and UCL = lower and upper 90% confidence limits on D; %CV = percent coefficient of variation of D; n = number of observations used to estimate D.

Table 49. LISP unadjusted counts for the MBNF (all cover types) 2004-2008

Year	2004	2005	2006	2007	2008
Effort (# points surveyed)	215	657	631	617	651
LISP (# birds observed)	84	317	375	387	116
LISP Relative Abundance	0.390698	0.482496	0.594295	0.627229	0.178187

Lincoln's sparrow was identified as the MIS species best suited to assist in evaluating this management issue related to ungulate herbivory in willow riparian areas and the specific question:

- **MBNF**: Are we leaving enough shrubs in the riparian zones? Are riparian-dependent species changing in abundance with on-going grazing and the introduction of moose?

Herbivory from livestock, as well as wild ungulates, affects riparian vegetation. If not managed properly, herbivory by domestic livestock and wildlife affects streams and can adversely impact the stream bank, leading to long-term changes in stream and associated riparian systems. Herbivory effects on riparian and stream systems have been identified as a problem in local areas on the Forest but have not been identified broadly.

Population trends of this species have historically been relatively stable across Wyoming and density estimates on the MBNF are most often considerably higher than those at the state level. This information indicates that management approaches implemented in the Medicine Bow National Forests have been adequate at maintaining Lincoln's sparrow populations at densities much higher than the state average.

American three-toed woodpecker (Picoides dorsalis)

The American three-toed (ATTW) woodpecker, hereafter referred to as three-toed woodpecker, depend on mature conifer forests for feeding and nesting. They are primary cavity nesters preferring late-successional spruce-fir, as well as lodgepole pine forests. They also use recently burned and beetle-infested areas for the rich supply of food. They feed primarily on bark beetles and wood-boring beetles by removing bark from dead and decaying

conifer trunks exposing the inner bark and cambium. Three-toed woodpeckers occur in low densities throughout their range with some population increases where disturbance has taken place and there is an infestation of beetles. It is possibly one of the most important birds in combating forest insect pests in the western United States. For instance, in Colorado, its annual diet is 65% spruce beetles, while its winter diet is 99% beetles. They are highly mobile and can disperse across large landscapes (Wiggins 2004a).

According to Wiggins (2004a), three-toed woodpeckers are widely distributed throughout the boreal forests of North America, closely matching the distribution of spruce trees. Distribution is patchier in the southern part of their range, into northern Arizona, and central New Mexico.

In Region 2, three-toed woodpeckers are found in South Dakota within high elevation conifer forests of the Black Hills. They are widely distributed in Wyoming but restricted to high elevation conifer forests. In Colorado, breeding has been recorded in all high elevation mountain ranges. Three-toed woodpeckers are not found in Kansas and only 5 records exist from extreme northwest Nebraska.

American three-toed woodpeckers are year-round residents on the Medicine Bow Forest and use coniferous forested habitats for feeding and nesting.

Population Status: Additional analysis was completed in 2008 evaluating this species population on the Medicine Bow National Forest. Spruce-Fir habitat is not surveyed across Wyoming under the MWB program. (Blakesley 2008b).

Table 50. Estimated densities of ATTW in spruce-fir habitat on the MBNF, 2005-2007 (Blakesley 2008b)

	Medicine Bow National Forest				
Year	D	LCL	UCL	%CV	n
2005	10	3	29	69	6
2006	27	11	66	55	21
2007	37	16	84	50	30

D = estimated density (birds/km^2); *LCL* and *UCL* = lower and upper 90% confidence limits on *D*; *%CV* = percent coefficient of variation of *D*; *n* = number of observations used to estimate *D*.

Table 51. ATTW unadjusted counts for the MBNF (all cover types) 2004-2008

Year	2004	2005	2006	2007	2008
Effort (# points surveyed)	215	657	631	617	651
ATTW (# birds observed)	3	19	50	53	59
ATTW Relative Abundance	0.013953	0.028919	0.079239	0.0859	0.09063

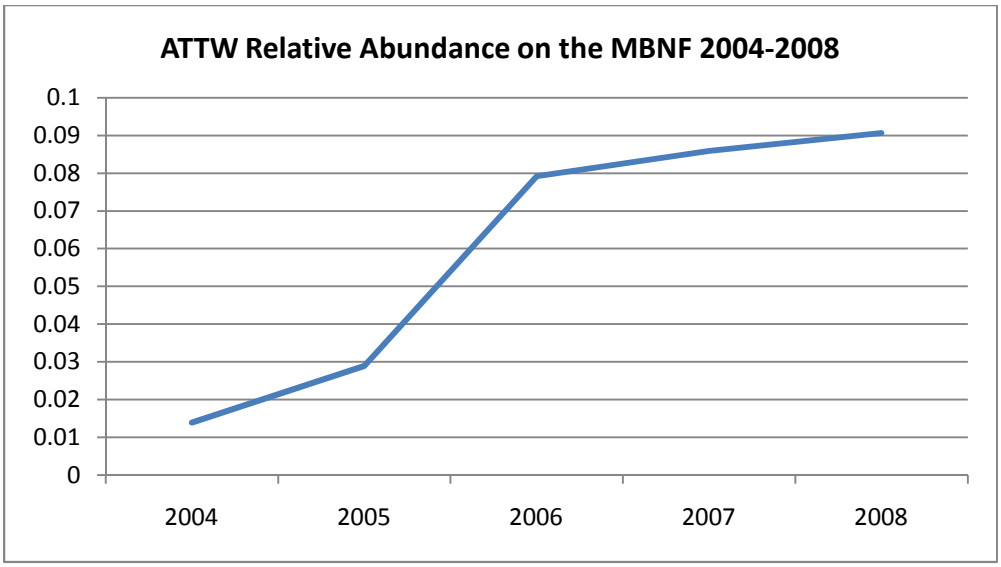


Figure 21. Overall relative abundance (relative abundance across all areas sampled) of the ATTW on the Medicine Bow National Forest 2004-2008

This species typically occurs at a relatively low density during periods when bark beetle populations are at endemic levels. During bark beetle epidemics, this species population increases in response to the abundant food supply. This increasing population is demonstrated in Figure 21 above as well as in the density estimates provided in Table 51.

The anticipated effects of the bark beetle epidemic to American three-toed woodpeckers and their habitat are fully described in Loose 2009. In brief, American three-toed woodpecker populations and habitat are anticipated to increase dramatically in beetle killed lodgepole pine stands followed by a dramatic decline as bark beetle populations collapse following the stand mortality. Populations will tend to seek refugia in mature spruce-fir dominated forests. Habitat recovery would begin in the very long-term (81-200 years) (Loose 2009).

On the MBNF, the American three-toed woodpecker was identified as the MIS species best suited to assist in evaluating this management issue related to snags and the specific question:

- Are the number and type of retained snags meeting species needs?

Population densities of this species have historically been relatively low, but have increased dramatically in recent years. At the same time, the numbers of snags in the MBNF has increased dramatically. There are significantly more snags on the MBNF now due to the bark beetle epidemic, than were predicted during the LMRP development. Given this, snags are not anticipated to be limiting for wildlife on the MBNF in over the next several years.

American marten (Martes americana)

"American marten are primarily animals of dense, old forest with a complex structure of understory and downed wood. Late-successional multi-storied stands of spruce-fir forest are preferred, though multistoried lodgepole (usually with invading subalpine fir) and other forest types with downed wood are also used. Martens are found in dense forest with canopy cover of at least 30%. A complex arrangement of downed wood (large logs, tangles of smaller material, root wads, downed trees with branches, and sloping logs with branches) provide

habitat for prey, cover from predators, dens, resting sites, and entry into subnivian habitat (Thompson and Harestad 1994). Squirrel middens, hollow logs, cavities in snags, and rock piles are used for dens (Ruggiero 1998). Partially arboreal, marten hunt and rest in trees, in cavities and on mistletoe brooms (Bull Parks et al. 1997).

Martens appear to respond to fragmentation (including perforated patterns) at the scale at which logging typically occurs on Forest Service land. Marten populations declined to near zero when 25%-30% of a watershed was logged (Bissonette, Harrison et al. 1997), a decline that would not be expected until 60% of the mature forest was logged if the animals were responding to habitat loss alone. Where forest is fragmented by regeneration harvest, a marten must occupy a larger area to include adequate forest habitat in its home range" (MBNF LMRP FEIS H-12).

The population of American marten on the MBNF has been monitored by collecting hair (hair snares) then analyzing the DNA from the root follicles to identify individual martens detected. Numbers of individuals detected each year then provides an index of the number of martens across the Forest in likely marten habitat.

Table 52. American marten Forest-wide monitoring results.

YEAR	Total Marten Samples	# Known Individuals in Sample	# New Individuals	# Previously Identified Individuals
2004	14	7	7	0
2005	36	18	15	3
2006	15	7	5	2
2007	21	14	9	5
2008	5	3	1	2
Cumulative Number of Individuals			37	

American marten were selected as MIS for the MBNF LMRP to represent the following issues:

- **Old growth** (in spruce-fir and lodgepole pine): Is the amount and distribution of old growth being left adequate for maintaining viable populations of species requiring old growth or old growth components?
- **Dead down wood**: (Are we leaving enough and in the right manner to meet the needs of wildlife dependent on down wood? How does this conflict with traditional fuels management/forestry?
- **Spatial pattern/fragmentation** – perforation at landscape scale (not within stand): Is the pattern of openings on the land meeting the needs of wide-ranging or interior forest associates (clear-cuts, roads)?

The current mountain pine beetle epidemic is anticipated to have effects to American marten and marten habitat as described in Kozlowski 2009. According to the hypothesis described in Kozlowski 2009, spruce-fir will become a much more significant habitat component for this species in the future as lodgepole pine (including old growth lodgepole pine) is killed by mountain pine beetle. Down wood is not anticipated to be limiting in the near term, as dead trees begin to fall and increase structural complexity that benefit American marten. Given the extensive pine mortality and the shift in management from live tree harvest to salvage harvest in the lodgepole pine type, consideration should be given to if additional direction is needed to ensure that future lodgepole forests will again provide high quality habitat for the American marten.

Snowshoe hare (Lepus americanus)

The snowshoe hare (SSH) is the primary of the Canada lynx, a federally threatened species. The snowshoe hare is also an alternate prey source for two sensitive species, the American marten and the northern goshawk. The snowshoe hare is known to respond to vegetation management. This species was selected to indicate the adequacy of habitat on the Medicine Bow National Forest in providing an important prey species to conservation priority predatory species. Selection of the snowshoe hare as an MIS addresses the management question of the adequacy of habitat to support prey species of top predators (MBNF LMRP FEIS H-12).

Population Status: The Medicine Bow National Forest established a monitoring program for snowshoe in 2004. This program was re-designed following the 2004 field season due to limitations with the sampling design and as a result, new monitoring plots were established in 2005. The pellet count information from 2004 and 2005 likely represent more than one year's accumulation of pellets to the plot (above duff layer), since these plots were not cleared of pellets the year prior to the count. This data is presented, however this data should not be compared to the information presented from 2006-2008. Furthermore, although the 2004 and 2005 data both represent year-1 plot data, these data should not be compared, since they are derived from different sampling designs.

Table 53. Mean Snowshoe Hare Pellet Count by Cover Type: 2004-2008

	2004	2005	2006	2007	2008
Overall	5.09	5.99	4.09	3.63	3.64
Aspen			5.16	5.58	3.54
Lodgepole			4.80	4.39	4.69
Spruce-fir			2.15	1.37	1.19

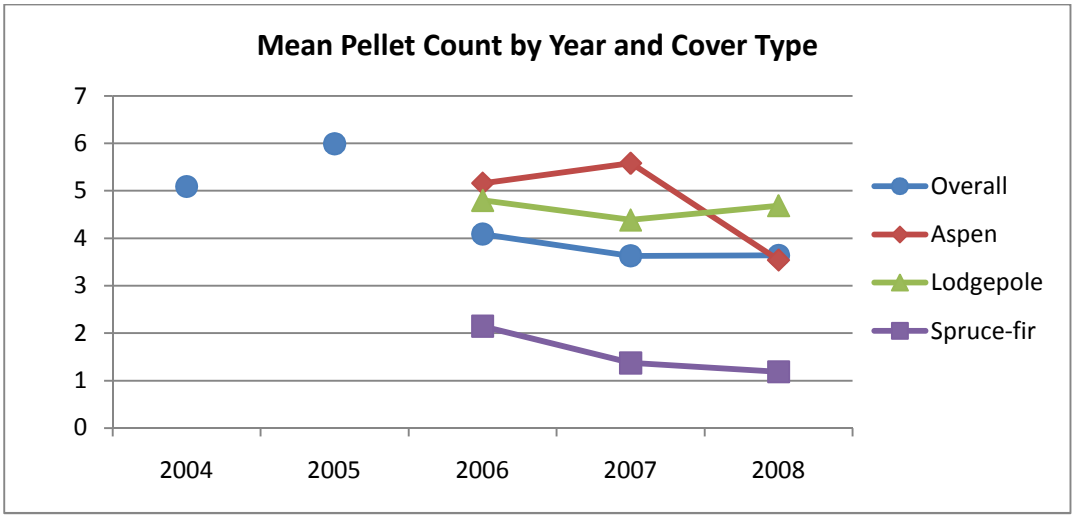


Figure 22. Mean snowshoe hare pellet count on the Medicine Bow National Forest by Cover Type: 2004-2008.

Spruce-fir is widely considered the vegetation type most highly correlated with high snowshoe hare densities, this data set surprisingly indicates that aspen and lodgepole pine cover types may also have high value to snowshoe hare on the Medicine Bow National Forest. Much of the conservation focus of the Canada lynx focuses on winter hare habitat. It is important to understand that these data represent year-round snowshoe hare habitat use. Aspen and lodgepole pine may be being disproportionally utilized by snowshoe hare during the snow-free periods.

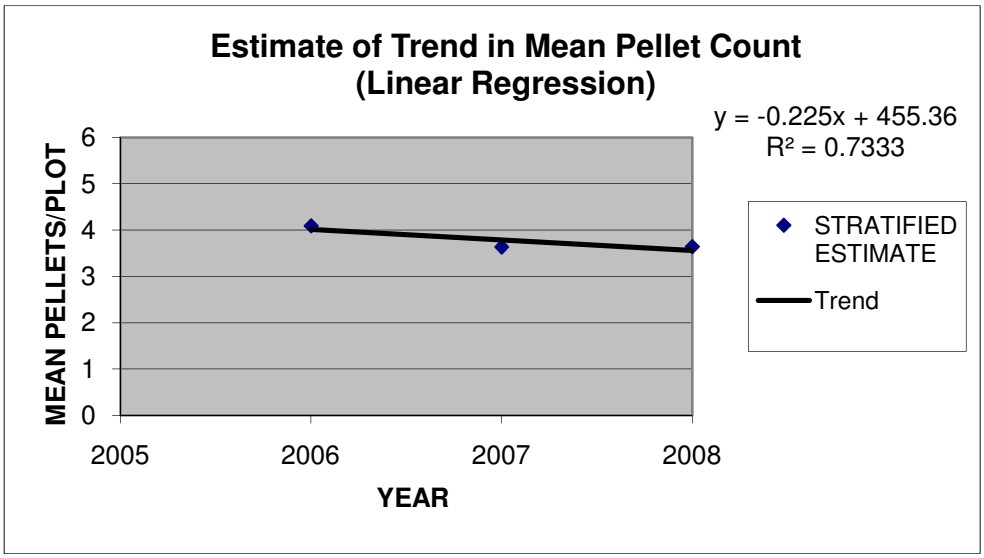


Figure 23. Estimate of overall snowshoe hare trend in mean pellet count: 2006-2008 (Beck 2008).

The data from 2006-2008 was analyzed for trend in the mean pellet count collected across all monitoring plots on the Medicine Bow National Forest. The linear regression analysis indicated a slight downward trend. The goodness of fit of this model was evaluated using the coefficient of determination (R^2). A R^2 is a measure of how well the model approximates the data with the value of 1 indicating a perfect fit and a value of 0 indicating no correlation.

Only 3 of the 5 years of monitoring data were able to be utilized in this evaluation of trend. In the more northern portions of this species range, the snowshoe hare is well known to have cyclical population dynamics characterized by dramatic increases in hare density followed by rapid decreases in hare density. Thus trends for this species are most often not linear and only properly evaluated over many years of monitoring.

Snowshoe hare was selected as MIS for the MBNF LMRP to represent the following issues:

- TES: Is habitat adequate to support the prey base of top predators (lynx, marten & goshawk)?

From the data presented, it is reasonable to conclude that the relative abundance of snowshoe hare as indicated by mean pellet count values has not changed much during the 5 year monitoring period of the implementation of the Medicine Bow National Forest LRMP.

The anticipated effects of the mountain pine beetle epidemic to snowshoe hare are presented in Miller 2008.

Fire Management Plans

Medicine Bow Item Objective 1.c.1
Frequency of Measurement: Annual
Reporting Period: Annual

This monitoring item asks the question:

Has the Forest developed a fire management plan, which allows for implementing wildland fire use plans to work towards desired conditions?

Monitoring Protocol/Data Collected

This item is answered with an annual update of the progress on wildland fire use plans. The national Fire Policy was changed in 2009 to eliminate the term Fire Use.

Results/Evaluation

The Northwest Colorado Fire Management Plan, an interagency plan that has included the Routt portion of the Medicine Bow–Routt National Forests, was completed in 2002. Yearly updates to this plan have been completed allowing for adherence to changing national guidance and direction. The Fire Management Plan (FMP) for the Medicine Bow portion of the Forests was updated in 2008.

The National Fire Policy for the Forest Service for 2009 has rendered terminology used in both current FMPs outdated. Therefore in 2010 the Fire Management Plans for both Forests will need to be updated to reflect the changes in the new Fire Policy. The New Fire Policy directs the Forest Service to treat a wildland fire incident as follows:

All fire will receive a Wildfire Response. Wildland fire is a term describing any non-structure fire that occurs in the wildland. Wildland fires are categorized into two distinct types:

- Wildfires – Unplanned ignitions and planned ignitions that are declared wildfires. The wildfire term is to be applied to all unplanned ignitions, including events formally termed wildland fire use.
- Prescribed fires – Planned ignitions.

A wildland fire may be concurrently managed for one or more objectives and those objectives can change as the fire spreads across the landscape, encountering new fuels, weather, social conditions, and governmental jurisdictions.

This policy change will allow for the safest, most efficient and cost effective fire response activities to be used across the forest regardless of area designation. This policy change will also allow fire to be managed to affect desired conditions where necessary and preferred.

We expect to have a Fire Management Plan that incorporates the new fire policy in place for the 2010 fire season.

Recommendations:

- The language and terminology found in the new Federal Wildland Fire Policy should be incorporated into the forest plans to reflect the current policy.

Fuels Treatments

Medicine Bow Item Objective 1.c.2
Frequency of Measurement: Annual
Reporting Period: Annual

This monitoring item asks the question:

How many acres in high hazard/high risk and residential interface areas were treated with mechanical treatments or prescribed fire in an effort to move affected landscapes toward their desired vegetation composition and structure as described in the Geographic Area direction?

Monitoring Protocol/Data Collected

Annual accomplishment reports can be generated listing acres treated by Wildland Urban Interface (WUI) vs. non-WUI, and mechanical vs. prescribed fire. These reports can be found in the FACTS database, reference Key Points 3 and 6.

Results/Evaluation

Implementation of mechanical treatments costs many times the per acre cost of prescribed burning treatments. As a result, mechanical treatments are often left on the shelf and replaced by prescribed burning, which yields the Forest many more acres for the dollar spent. This may have the potential to influence the number of WUI mechanical acres treated annually. Washington Office and Regional Office direction outlines an optimum treatment ratio of 60 percent WUI to 40 percent non-WUI. For FY08 the ratio of WUI to non WUI was approximately 55 percent WUI and 45 percent non-WUI (including the fuels projects on the Thunder Basin National Grassland).

Table 54. Fuels treatments on the Medicine Bow–Routt NFs, 2004-08.

Treatment Type	2004	2005	2006	2007	2008
Mechanical Treatments					
WUI	4,818	346	1429	1290	3036
Non-WUI	115	409	592	452	1214
Mechanical Treatment Total	4,933	755	2021	1742	4250
Prescribed Fire					
WUI	1,097	3,586	1563	200	289
Non-WUI	2,310	1,780	3070	1861	1535
Prescribed Fire Total	3,407	5,366	4633	2461	1824
Treatment Total	8,340	6,121	6654	4303	6074

Insects and Disease

Legally Required Monitoring Item
Medicine Bow Item Objective 1.c.3
Routt Monitoring Item 1-4
Frequency of Measurement: Annual
Reporting Period: Five Years

This monitoring item asks the question:

Are insect and disease populations compatible with attainment of management area desired conditions and themes?

Monitoring Protocol/Data Collected

Aerial surveys were conducted over the Routt and Medicine Bow National Forests since 2003 to provide a broad indication of tree mortality resulting from forest insects and disease. More information and products from the R2 forest health monitoring program can be found on the following website: http://www.fs.fed.us/r2/fhm/

Results/Evaluation

Bark beetle epidemics continued to develop and increase on the MBR. Aerial surveys completed in the summer of 2008 indicated that on the Routt National Forest approximately 426,000 acres had been impacted by mountain pine beetle (MPB) and 2,400 acres by the spruce beetle (SB). The Medicine Bow National Forest had approximately 345,000 acres attacked by MPB and 4,100 acres by SB. The survey data reflects the impacts of the prior year's beetle attacks, aerial surveys rely on the fading crowns of dead trees to locate and quantify the severity of forest pest attacks. Trees attacked and killed in 2008, will not exhibit fading crowns till the summer of 2009.

The predominant tree species affected by the mountain pine beetle on the Medicine Bow – Routt NFs is lodgepole pine. Lodgepole pine stands with these attributes are considered to be at the highest risk: average dbh greater than 8 inches, average age greater than 80 years, stand basal area greater than 120 square feet per acre, and elevation less than 10,000 feet (Amman et al. 1977). Approximately 50% of the lodgepole pine on the Routt NF is considered moderate to high risk for MPB attack due to its age, dbh, and stand density. Weather conditions such as moderate winter temperatures, and warm, dry summers also contribute to the expansion of the epidemic.

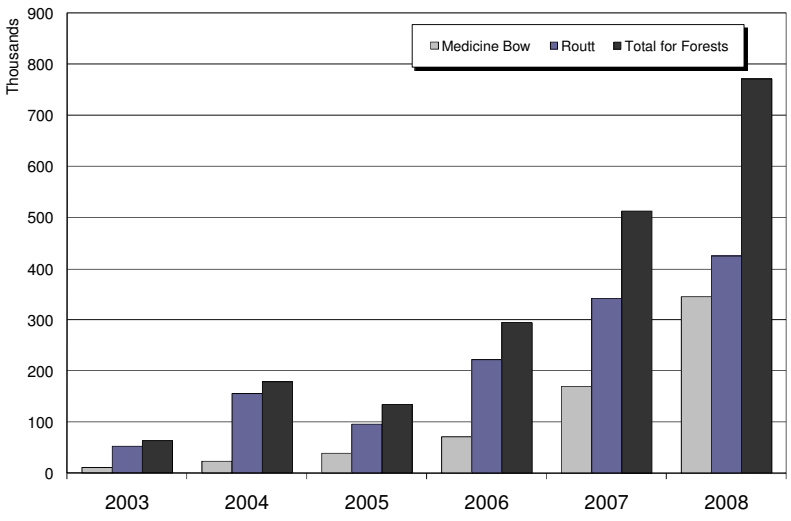


Figure 24. Annual acres affected by MPB epidemic from 2003-2008

The Medicine Bow National Forest is also experiencing continuing expansion of the MPB epidemic (see Figure 24). On the Medicine Bow NF approximately 46% of the lodgepole pine stands are considered to be moderate to high risk of MPB attack, while approximately 70% of the spruce are moderate to high risk of spruce beetle attack.

Spruce stands with average dbh greater than 16 inches, stand density greater than 150 square feet per acre, and stands with a high percentage of spruce (65% or greater) are generally considered at high risk for SB attack. Approximately 56% of the spruce stands on the Routt NF can be considered to be at moderate to high risk of SB attack due to size, stand density, and high percentage of spruce in the stands. The spruce beetle is expected to continue spreading into spruce stands across both forests (see Figure 25).

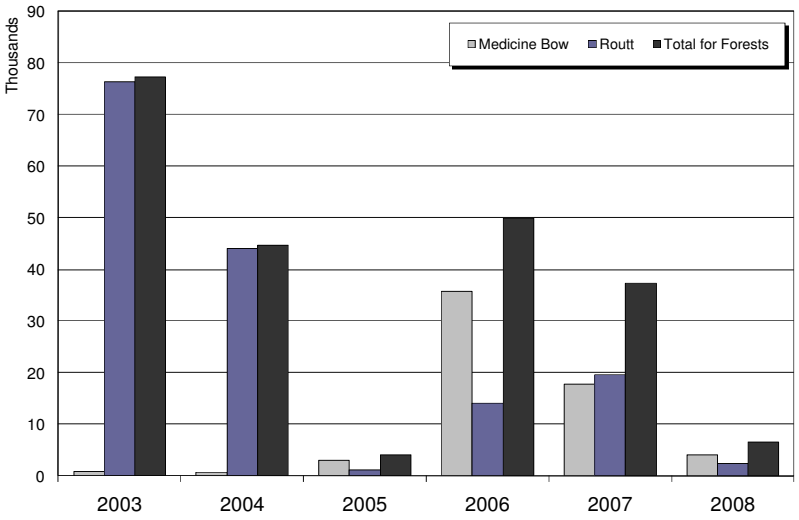


Figure 25. Annual acres affected by Spruce Beetle from 2003-2008

On the MBR in fiscal year 2008, the Forest Service applied direct control (spraying) of MPB and SB on 615 acres (25 campgrounds, 11 administrative sites), sold 8 timber sales that will treat 6,000 acres affected by bark beetles. The Forest also initiated planning and analysis in the Red Dirt, Little Snake North, Shellrock, and Savory project areas for additional vegetation treatments utilizing Healthy Forests Restoration Act authority. All project areas are designed to salvage stands impacted by the MPB and SB epidemics.

Subalpine fir decline (SFD), caused by a combination of western balsam bark beetle and various root disease pathogens, is still causing significant mortality in subalpine fir stands. The Routt NF has approximately 17,000 acres affected by SFD, and the Medicine Bow NF has approximately 10,000 acres diagnosed with SFD. Generally SFD causes smaller amounts of mortality in stands as compared to that of the bark beetle epidemics.
White pine blister rust, a canker causing disease that is spread by a non-native fungus (*Cronartium ribicola*) is affecting limber pine stands across both Forests. The primary infection area is the Pole Mountain area of the Medicine Bow. The Routt NF is estimated that approximately 170 acres are infected, while the Medicine Bow NF has 1,600 acres affected. Currently the Medicine Bow – Routt NFs are working cooperatively with the Rocky Mountain Research Station, Region Two Forest Health Management, and Colorado State University to locate and develop genetically resistant strains of limber pine for future limber pine restoration.

Another significant mortality causing disease is sudden aspen decline (SAD) in quacking aspen. SAD is believed to be the result of the extended drought, and the large amount of aspen in mature age classes. SAD has affected approximately 55,200 acres on the Routt NF, and 12,100 acres on the Medicine Bow NF. SAD can be detected by declining vigor in aspen (reduced leaf coverage and pale green foliage). Currently there is nothing that can be done

to prevent continued dieback and mortality of affected trees. Where clones still retain some vigor and energy, but are deteriorating, regeneration may be stimulated by burning, cutting, or other stand manipulation before root systems are too weak to respond.

Conclusion:

The MBR NFs are experiencing a continuing escalation of bark beetle epidemics which started in the late 1990's. Until 2005 the majority of the bark beetle mortality was primarily in Colorado (Routt National Forest), but in the last three years, bark beetle populations have exploded on the Medicine Bow National Forest, particularly in the southern portions of the Medicine Bow & Sierra Madre mountain ranges. The mountain pine and spruce bark beetle epidemics will probably continue for at least another 3-5 years. Approximately 1,250,000 acres of Medicine Bow – Routt NFs have suffered some degree of tree mortality as a result of the bark beetle infestation. The current epidemic is unprecedented within the last 150 years.

Recommendations:

The rate of spread of mountain pine and spruce bark beetle that the Forests have experienced in the last few years will probably continue for the next 3-5 years. Any vegetative management in lodgepole pine and spruce should anticipate what the condition of the stands will be in 2-3 years. In the past forest managers have implemented silvicultural strategies to suppress beetle epidemics when recommending silvicultural treatments, and still suffered extensive mortality in the residual stands. When recommending vegetative treatments in moderate to high risk stands for beetle infestation, the forest manager should anticipate extensive mortality and strongly consider salvage treatment and reforestation of the affected stands.

Invasive Species

Medicine Bow Item Objective 1.c.4
Frequency of Measurement: Annual
Reporting Period: Annual

This monitoring item asks the question:

To what extent have noxious weed populations been managed (Forest-wide and within wilderness)?

This monitoring item tracks the extent and treatment of invasive species, which is one of the four threats to the National Forests.

Monitoring Protocol/Data Collected

Acres treated chemically, mechanical and manual treatments, including insect releases. Data from the targets reported in the NFS budget and target tracking system (WorkPlan).

Results/Evaluation

Four acres of yellow toadflax were treated in the Flattops Wilderness Area on the Routt NF and one acre of a recently-discovered knapweed population was treated in the Platte River Wilderness area on the Medicine Bow NF. The two acres of known leafy spurge infestation in the Platte River was not treated in 2008.

Table 55. Invasive Weed Treatment in 2008.

Forest	Forest Plan Acres Expected to be Treated per year	Acres Treated	Wilderness Acres Treated
Routt	385	533	4
Medicine Bow	1,200	813	1
Total	1,585	1,346	5

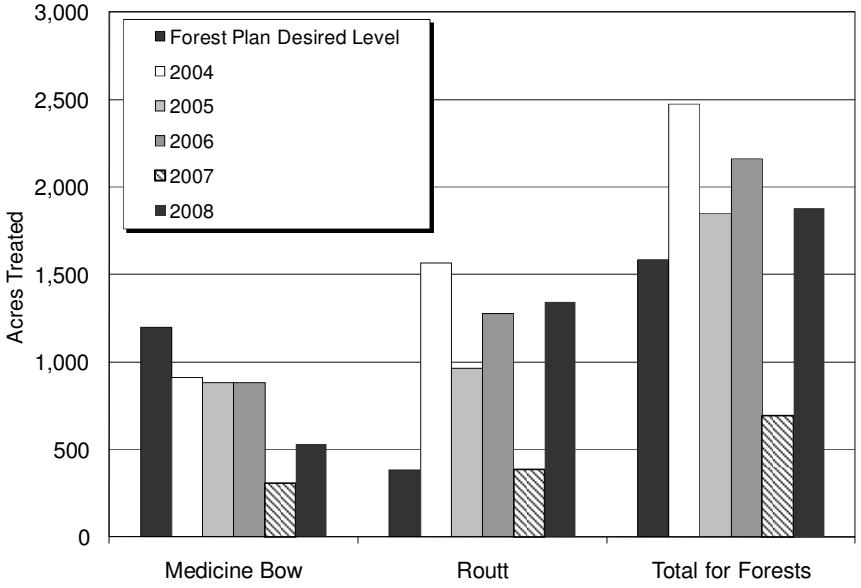


Figure 26. Acres of Invasive weed Treatment 2004-2008

Funding available for treatment of noxious weeds was substantially reduced in FY07, and again in FY08.

Table 56. Invasive weeds treated compared to forest plan levels for MBNF and RNF.

Year	RNF Planned (acres)	RNF Treated (acres)	Percent	MBNF Planned (acres)	MBNF Treated (acres)	Percent	Total N.F. Treated (acres)	Percent
1999	385	1,871	486					
2000	385	1,145	297					
2001	385	992	258					
2002	385	925	240					
2003	385	1,003	261					
2004	385	1,565	406	1,200	910	76	2,475	156
2005	385	964	250	1,200	885	74	1,849	117
2006	385	1,279	332	1,200	881	73	2,160	136
2007	385	387	100	1,200	306	26	693	44
2008	385	533	138	1,200	813	68	1,346	85
Average:		1,066	277%		759	63%	1,705	108%

Monitoring accomplished in 2008:

- Mapping of 7 additional cheatgrass sites (GIS shapefile)
- Establishment of 4 new photopoints - three in Lake Creek allotment, one in Big Creek Allotment
- Retake 6 photopoints in Lake Creek Allotment
- Retake 5 photopoints in Pennock Wildlife Unit

Recommendations:

Continue to report acres of noxious weeds treated each year, along with reasons for annual fluctuations in amounts and species of weeds treated; data are useful to discern trend of infestations and treatments.

Continue to map and document changes in cheatgrass populations on the forests.

Secondly, Region 2 and the Forests are actively working to resolve the discrepancies in the FACTS database regarding treated acres, and hope to have the corrections made in the next year. The Regional Invasive Species Coordinator is currently refining explanations for acres infested and acres treated that will be used for database reporting in FY09.

Aquatic Invasive Species

MBNF

Monitoring Protocol/Data Collected:

In 2007, the Medicine Bow National Forest confirmed the presence of Didymo (*Didymosphenia geminata)* in the Forest; the first observation of this diatom was made near the confluence of the Encampment River and Purgatory Gulch (Sierra Madre, east of the Continental Divide). In 2007 and 2008, visual surveys were conducted to look for additional occurrences of Didymo. Samples of suspected Didymo were sent to either the Wyoming Game and Fish Department, Fish Pathology Laboratory, or to the USGS for identification.

Results/Evaluation

Didymo was confirmed in the Encampment River, Hog Park Creek and Douglas Creek. Didymo is thought by some investigators to be a native species, although it may become a nuisance to other aquatic organisms under favorable environmental conditions.

The Forest has created and disseminated aquatic-nuisance species posters to inform Forest employees and the public about how to recognize and prevent the spread of Didymo, and other invasive and/or nuisance aquatic species.

RNF

No activity has occurred in the past decade to monitor for aquatic-nuisance species.

Recommendations

Continue to monitor for Didymo and other aquatic-nuisance species that may be introduced into the Medicine Bow National Forest and initiated monitoring on the RNF. Monitor for additional, aquatic-nuisance species such as the New Zealand mud snail and the quagga

mussel. Continue public outreach efforts on the MBNF and expand efforts on the RNF to educate NFS employees and the public about issues related to the introduction and environmental impacts of these species.

Landscape Patterns

Legally Required Monitoring Item
Medicine Bow Item Subgoal 1.c, 36CFR 219.12 (k)(iii)
Reporting Period: Five Year

This monitoring item asks the question:

How is harvest unit size affecting landscape patterns across the Forest?

The National Forest Management Action specified that:

> *In developing, maintaining, and revising plans for units of the National Forest System pursuant to this section, the Secretary shall assure that such plans-*
>
> *(2) specifying guidelines which-*
>
> *(iv) there are established according to geographic areas, forest types, or other suitable classifications the maximum size limits for areas to be cut in one harvest operation, including provision to exceed the established limits after appropriate public notice and review by the responsible Forest Service officer one level above the Forest Service officer who normally would approve the harvest proposal: Provided, that such limits shall not apply to the size of areas harvested as a result of natural catastrophic conditions such as fire, insect and disease attack, or windstorm;*

The Rocky Mountain Regional Planning Guide which was guidance for the LRMPs set 40 acres as the maximum allowable opining size for all forest types.

Regional Guides were abolished by the 2000 planning rule (36 CFR 219.35(e) - Federal Register 11/9/00 p. 67579). R2 Supplement 2400-2003-1 states that it "incorporates the standard size for harvest opening previously contained in the Rocky Mountain Regional Guide (now withdrawn)." The supplement 2471.1 provides the 40-acre limit in R2 and exceptions including catastrophic conditions or when approved by the Director of Renewable Resources.

Not all harvest types are considered to create openings. The MB LRMP has the following definition of a created opening: A treated forest area 10 basal area or less. The Routt LRMP did not specifically define a created opening. R2 supplement to FSM 2470 indicates that openings are created through the use of even-aged regeneration harvest methods.

The MBNF LRMP identified the following desired conditions:

> Created openings vary in size from less than 40 acres to hundreds of acres in size, or are staged to create larger patterns that would simulate natural landscape patterns caused by windthrows, insects and disease and wildfires over time. On 26% of the Forest (MA 5.15), the emphasis of harvest activities is to emulate the patterns, structures, and function of natural processes.

The 1997 Revised Routt Forest Plan states that 40 acres is the maximum harvest unit size with the following exceptions":
• Proposals for larger openings approved by the Regional Forester after a 60 day public review.
• Where larger openings are the result of natural catastrophic conditions of fire, insect or disease attack, or windstorm.
• Where the area that is cut does not meet the definition of created openings.

Results/Evaluation

In 2008, there were harvest units completed on both the MB and RT. The unit sizes for these ranged from 2 – 17 acres with an average unit size of 10 acre and a combined total of 49 acres.

Table 57. Harvest unit size for 2008

Forest	District	No. of Units	Minimum Size (acres)	Maximum Size (acres)	Average Size (acres)	Total (acres)
MBNF	02	2	2	17	10	19
RNF	04	3	4	13	10	30
Total					10	49

For the MBNF and the period of 2003 to 2008 (the first five years after the LRMP revision), openings created through harvest varied from two acres to forty acres over the five year period. No harvest units exceeded 40 acres on the Medicine Bow National Forest since the implementation of the revised Medicine Bow National Forest Land and Resource Management Plan began in 2004. The average size of the harvest units from 2004 through-2008 for the MBNF was 7.1 acres.

For the RNF and the period 1999-2008 (the first ten years after the LRMP revision), openings created through harvest varied in size from one acre to 73 acres over the five year period. The RNF did have one harvest unit over 40 acres (73 acres). In addition, in 1998, Gore Pass units 36,37, and 42 combined to create a composite created opening of 117 acres. These units were designed to combine several small units into one large unit to emulate the natural patch size and pattern found on that landscape. The average size of harvest units from 1999 through-2008 on the RNF was 16.8 acres.

Information about minimum, maximum and average unit size for the MBNF for 2004-2008 is displayed in the following table:

Table 58. Harvest unit size for 2004-2008 for MBNF

Year	No. of Units	Minimum Size (acres)	Maximum Size (acres)	Average Size (acres)	Total (acres)
2004	6	2	37	17	102
2005	23	2	40	20	459
2006	24	2	35	11	252
2007	26	1	38	15	389
2008	2	2	17	10	19
Totals	173			7.1	1221

Information about minimum, maximum and average unit size for the RTNF for 1999-2008 is displayed in the following table:

Table 59. Harvest unit size for 1999-2008 for Routt

Year	No. of Units	Minimum Size (acres)	Maximum Size (acres)	Average Size (acres)	Total (acres)
1999	17	4	24	12	209
2000	28	1	40	12	325
2001	19	3	22	10	194
2002	15	3	34	18	265
2003	17	5	73	32	550
2004	0	0	0	0	0
2005	6	1	39	9	51
2006	14	4	37	18	256
2007	31	2	40	21	640
2008	3	4	13	10	30
Totals	**150**			**16.8**	**2,520**

Harvest units during the first few years after an LRMP revision are the result of projects that were planned years earlier under direction of the previous LRMP. More recent harvest units are more likely to be the result of revised LRMP direction.

Harvest unit size is sometimes but not always indicative of the patch size created. Where there are patch shape or size patterns that were created under previous direction and now the desired conditions are different, a small new harvest unit next to established regeneration can create a larger desired patch of similar aged forest.

Harvest units planned since LRMP revision have been designed to meet several management objectives for the forested landscape such as; maintaining forest health, reducing losses to insects and diseases, reducing risk of wildfires and providing wood fiber.

Several timber sales under contract and offer for 2009 will have units larger than 40 acres but these units may not always create openings. Regional Forester approval is not required if units larger than 40 acres were the result of bark beetle infestation because these units are not considered to be even-aged management but rather to be salvage of already existing mortality.

In the RNF five year review, information on harvest sizes indicated that the size of harvest units emulates the patterns displayed in the analysis of patch patterns from the Revised Routt LRMP. There are few large harvest units and many more small harvest units. Although this may not be creating the exact pattern that was evident historically when natural processes (fire, insects and diseases) were the major forces creating landscape patterns, smaller patches can coalesce into larger patches over time and under the operation of natural processes.

This same pattern would be true for the 2nd five years of the RNF LRMP implementation and the 1st five years of the MBNF LRMP implementation.

Because of the decrease in value of timber as trees die and dry and the anticipated lack of markets, the landscape view is expected to be a sea of gray for years until most of the lodgepole pine has fallen.

Where harvest is possible and economical, in the future, it is anticipated that the number harvest units larger than 40 acres will increase due to the mountain pine beetle mortality in lodgepole pine forests. The larger harvest units would be designed to emulate landscape patterns of natural disturbance as directed by the LRMPs.

Because the harvest opportunities may be limited, the patch size and pattern created across the landscape by the mountain pine beetle epidemic may be dominant over that created by harvest units in the near future.

Conclusion
The current direction on harvest size provides adequate direction and flexibility in guiding the size of harvest unit treatments.

Multiple Benefits to People

Effects of Recreation Activities

Medicine Bow Objective 2.a.1
Routt Monitoring Item 2-3
Reporting Period: Annual / Five Year

These monitoring items ask the questions:

To what extent have dispersed recreation sites been rehabilitated?

How are recreational activities affecting the physical and biological resources of the Forest?

Monitoring Protocol/Data Collected

This monitoring item is answered using field observation, inventory data and the actions taken to reduce the effects of recreation on forest resources.

Results/Evaluation

MBNF
Brush Creek/Hayden Ranger District

- A number of dispersed campsites in sensitive areas were eliminated or actively managed during implementation of the Soldier Summit EA decision. Several campsites are no longer accessible due to the decommissioning of roads in the analysis area. Specifically, in the North Fork of the Encampment drainage, barrier rocks were placed at a number of sites to restrict vehicle access in appropriate locations. These measures will reduce a number of typical impacts associated with dispersed camping in riparian areas.

- Recreation personnel, with assistance from many district employees, made a concerted effort to enforce the 21 day stay limit to both reduce dispersed camping impacts and allow access to dispersed sites for multiple forest users throughout the camping season.

Douglas Ranger District (Laramie Peak Unit)

- The number of dispersed campsites in the LaBonte Canyon Recreation Corridor is increasing. User created roads leading to the sites are in many cases are too steep which leads to erosion or are located in undesirable locations such as wetlands. The campsites themselves are being developed close to LaBonte Creek which leads to streambank impacts.
- Last year the district started fencing and placing large boulders to limit traffic and control the expansion of the campsites. This has been effective but since the entire canyon cannot be fenced, use continues to expand to new areas. The District is beginning a corridor management plan to address all recreation uses in the canyon. Planning is expected to continue through FY09.

Laramie Ranger District

- Removal of hazard trees from developed recreation sites has limited the time available to address other concerns such as dispersed campsite rehabilitation.
- The sites closed last year around Lake Owen remain closed but a few new sites have been created. The sites are signed as closed as they are discovered.
- Signage on Pole Mountain to close sites has had limited success. Sites are being developed by the recreating public in new areas. The district is working with a citizens' action group to address concerns on Pole Mountain.
- In general, implementation of the travel management plan on the district and availability of motor vehicle use maps has helped to reduce the number of new roads being developed.

RNF

Hahns Peak/Bears Ears Ranger District

- Illegal dispersed sites are defined as those within 100 feet of water, or exceeding Cole's Condition Class ratings specified in the Forest Plan. Within wilderness all illegal sites are rehabilitated as NFS employees and/or volunteers find them. Outside wilderness, only sites that are identified as illegal in environmental analyses are rehabilitated if identified and funds allow for rehabilitation.

Parks Ranger District

- Dispersed campsite cleanup work is an on-going project on the district. During the summer and fall seasons, recreation crews made a number of contacts in dispersed camping areas. During these contacts visitors are reminded to clean up after themselves, and informed on any new travel management information by receiving an updated MVUM.

- Dispersed campsites that are located within 100 feet of streams are being reviewed to determine if resource damage is occurring. These sites will either be hardened to prevent further impacts, or they will be rehabilitated and closed.
- Dispersed campsites further than 300 foot buffer allowed by the new OHV rule will need to be closed or designated appropriate under an additional NEPA decision.
- Dispersed recreation sites have been rehabilitated by physically blocking access to them by the installation of buck and rail fences. The district began this effort in the Illinois Drainage blocking access to areas greater than 300' from identified motor vehicle travel routes.

Yampa Ranger District

- Roads closed in Red Dirt Recreation Area, access changed from motorized to walk in for ~8 sites leading to 'island', and on island of Red Dirt Reservoir.

Recommendations

Brush Creek/Hayden Ranger District

- Complete the process to issue a special order to eliminate dispersed camping within 1/4 mile of developed campgrounds on the Brush/Creek Hayden Ranger District.
- Implement a fencing project at dispersed sites along Lincoln Creek on FSR 200 east of Lincoln Park Campground with the District Fisheries Biologist and Trout Unlimited.
- Inventory dispersed campsites in the North Savery Analysis Area to provide current data and input into the NE Sierra Madre Travel Management Analysis.

Douglas Ranger District (Laramie Peak Unit)

- Continue with the LaBonte Canyon Corridor Management Plan.

Laramie Ranger District

- Continue to work with the Citizens Action Group on Pole Mountain to develop a plan to address resource concerns from dispersed camping and travel.

Hahns Peak/Bears Ears Ranger District

- Prioritized and fund dispersed site inventory, monitoring and rehabilitation, perhaps collaborating with hydrology, soils.

Parks Ranger District

- Fund a dispersed campsite inventory, close and rehabilitate any campsites that are causing resource damage from being too close to bodies of water.

Yampa Ranger District

- Continue to monitor effectiveness of closure work, ID new sites to disperse use.

Action taken on 2007 recommendations

- Implement a Forest wide special order that would allow for enforcing the Forest Plan Standard of restricting dispersed camping within ¼ mile of a developed campground. This would have great potential to reduce impacts on the fringe of the campgrounds.
    - There was no action taken on implementing a forest wide camping special order that would eliminate dispersed camping within .¼ mile of developed campgrounds. A number of individual districts already have this special order in place for specific recreation sites.

Recreational Opportunities

Medicine Bow Objective 2.a.2
Routt Monitoring Item 2-1
Reporting Period: Annual / Five Year

These monitoring items ask the questions:

Where can we plan for and improve recreation sites?

Do recreational opportunities respond to Forest users' desires, needs and expectations?

MBNF

Brush Creek/Hayden Ranger District

- The majority of developed recreation sites on the District have been significantly impacted by the mountain pine beetle epidemic and to a lesser extent spruce beetle. A variety of strategies are being implemented to treat sites including spraying insecticides and removing dead and dying trees. In 2008, all sites with the exception of Silver Lake Campground were open with occasional temporary closures. Vegetation management plans are currently being developed via TEAMS to allow for appropriate post beetle mortality vegetation management.
- The District has continued to work with other Forest personnel on the planning and implementation of upgrades along the Snowy Range Scenic Byway. Significant improvements were made to the Brush Creek Work Center including restoration of the historic VIS building, Ranger Cabin, and Garage.
- Developed Recreation site Upgrades - Upgraded approximately 60 percent of the site furniture at Lost Creek Campground, made significant cosmetic upgrades to Lincoln Park Campground and Sandstone Work Center.
- The Mirror Lake Day use area was reconstructed 4 years ago. It is very popular with recreationists. Upkeep of the site is expensive because of its location and the sheer number of people who use it.

Douglas Ranger District

- During the last 2 years, several dispersed sites in the LaBonte Canyon Recreation Corridor were fenced to control expansion.
- The house at LaPrele work center is under the cabin rental program. Public use of the house has increased significantly over the years.

Laramie Ranger District

- Summer rental cabins on the district are very popular with the public. Spruce Fire Tower is rented at 100% occupancy from June 15th to Sept 30th. The Little Brooklyn Cabin is rented over half of the year. Keystone cabin rental is increasing in popularity. The office cabin at Keystone has been reconstructed over the past 2 years.

RNF

Hahns Peak/Bears Ears Ranger District

- The Hahns Peak Lake Campground is being completely reconstructed to meet visitor needs. The new campground will have new tables and fire rings. Parking pads are being widened and re-graveled. The toilets are being replaced with accessible models. Trail access throughout the campground is being improved.
- All hazard trees were removed from Hinman Campground. The toilets were replaced in the summer of 2009. Plans are underway to re-level the parking pads and install new tables and fire rings.

Parks Ranger District

- Many of the campgrounds are becoming worn out. Facilities are in poor shape in some campgrounds. Parking barriers, signs, and tables are breaking down. Some campgrounds are also providing less than ideal parking spurs with poor cross-slope, general grades, and surface treatments.
- Hidden Lakes, and Pines Campgrounds would benefit from road and parking spur reconstruction. This could easily be done by force account crews and the road crew if available. All four of the campgrounds that are projected of being open in the future need most of their facilities replaced.
- For the most part it seems that recreational opportunities respond to Forest users' desires, needs, and expectations. We still have a substantial amount of illegal OHV use of non-system roads and trails, which may be indicating that there is a need for additional miles and variety of open system trails for these user groups. It is becoming more difficult to keep trails cleared of deadfall with the large numbers of beetle killed trees that are falling each year, which is impacting some forest visitor's expectations of having cleared trails.
- Visitors are looking for a natural experience on national forest land. They are looking for areas where they are not over-regulated and have a variety of recreation opportunities such as fishing, hiking, ATV riding and general relaxation. They do like the added comfort and security of campgrounds. They value quality facilities which are taken care of on a regular basis. We find that sweet smelling toilets (SSTs) are most appreciated.
- One aspect of campground design that could better accommodate Forest users' expectations is the development of campsites to accommodate trucks pulling large camp trailers. Sites with pull-through access of up to 50' long are much-appreciated by Forest users' with this kind or equipment.
- A number of Forest users have commented on the desire to get away from the noise of ATVs. They do not like hearing the noise these machines generate in campgrounds.

All the campgrounds on the district allow the use of ATVs with the stipulation that they can only be used to leave and enter campgrounds.

Yampa Ranger District

- Roads leading to dispersed sites in Bear River Corridor were graveled to provide ease of access and to prevent erosion. Many of the dispersed sites were also hardened for the same reasons.
- Use is increasing in the campgrounds in the Bear River Corridor. Bear Lake Campground was reconstructed and expanded to meet this need a few years ago. Improvements at the other developed sites are needed to disperse the use and meet demand.
- Use at Red Dirt Reservoir is increasing. A site development plan is being considered.

Recommendations

Brush Creek/Hayden Ranger District

- Complete Landscape Plans at developed recreation sites in the Snowy Range Scenic Byway Corridor to assess potential improvements to those sites to meet user expectations.
- Improve marketing of the recreation rental cabins on the District to increase revenue and subsequently improve forest visitor experiences at these sites.
- Write a business plan for the Mirror Lake area and include the site in the District REA fee program.

Douglas Ranger District

- Continue with construction at the LaPrele Office as funds are available.
- Develop a site plan for use in the LaBonte Canyon Recreation Corridor.

Laramie Ranger District

- Add the office building at Keystone to the cabin rental program.
- Reconstruct other cabins as funds are available.

Hahns Peak/Bears Ears Ranger District

- Review the actions identified in the Recreation Site Facility Master Plan. Make changes as needed and implement the plan.
- Reconstruct Summit Guard Station as funds are available and add it to the cabin rental program.

Yampa Ranger District

- Reconstruct facilities at Horseshoe Campground.
- Review development at Gardner Park.
- Develop a site plan for Red Dirt Reservoir.

Outdoor Recreation

Medicine Bow Objective 2.a.3
Reporting Period: Annual

This monitoring item asks the question:

How many miles of trail meet agency standards?

Monitoring Protocol/Data Collected

This item is answered using the data collected by the districts on trail maintenance.

The following tables give the miles of trails meeting agency standards in FY08. Changes in trail miles from last year's report are due to updates to the database (INFRA) plus new trails that were constructed.

Table 60. Miles of summer trails meeting agency standards.

District	Trails on District (miles)	Trails meeting agency Standards (miles)	Percent (%)
Medicine Bow			
Brush Creek/Hayden	252	78	31%
Douglas (Laramie Peak)	112	95	84%
Laramie	153	65	42%
Routt			
Hahns Peak-Bears Ears	419	234	56%
Parks	271	203	75%
Yampa	218	218	100%

Table 61. Miles of winter trails meeting agency standards.

District	Trails on District (miles)	Trails meeting agency Standards (miles)	Percent (%)
Medicine Bow			
Brush Creek/Hayden	293	260	89%
Douglas (Laramie Peak)	0	0	
Laramie	127	115	91%
Routt			
Hahns Peak-Bears Ears	305	250	82%
Parks	82	79	96%
Yampa	90	50	55%

MBNF

Brush Creek/Hayden Ranger District

- Over 60 miles of trail were maintained across the district and a significant portion of the work involved heavy maintenance activities. Approximately 3/4 mile of new trail was constructed.

- Volunteers played an important role in the program this summer. Four volunteers performed reconnaissance and signing duties along the Continental Divide Trail from Deep Jack Trailhead to the Forest Boundary east of Divide Peak. Two local volunteers and their llama string logged out 17 miles of trail. The Wyoming YCC and incoming University of Wyoming students worked on intensive sage brush removal on the Encampment River Trail and a trail construction project on the South Fork of Hog Park Creek Trail. The District sponsored an Eagle Scout project that resulted in the construction of a 16 foot boardwalk over an ephemeral drainage on the newly constructed extension of the Mainline Trail.
- Personnel from the Wyoming State Trails completed the reconstruction of the Stump Hollow ATV trail near Lincoln Park Campground. Work was performed with a SWECO and drainage on the trail was significantly improved. ATV trails in the area were also signed to aid forest users in discerning acceptable ATV routes.
- District personnel continue to groom the Battle Highway (A trail) and Hog Park Road (B trail) in cooperation with the Wyoming State Trails. Additionally, the Bottle Creek and Brush Creek cross-country ski trails were groomed throughout the winter season. A grant was awarded from the Wyoming State Trails to purchase a grooming attachment and new snowmobile to groom the District cross-country ski trials.

<u>Douglas Ranger District (Laramie Peak Unit)</u>

- The 17 miles of trail inside Ashenfelder Basin was missed as a result of higher priority projects.
- The trail crews focus has been on tree removal and clearing.
- With implementation of the Laramie Peak travel analysis, 35 miles of new motorized trail have been added to the designated system. Of that, nearly 20 miles is restricted to 50 inch wide or less vehicles; whereas, the remaining 15 are open to all motorized vehicles. All of these were formerly roads. As part of the conversion, 5 miles of converted trail were rehabilitated by the Wyoming State Trail Crew. They did extensive drainage work, hardening, some trail rerouting and decommissioning, built a small trailhead at one site, did strategic fencing and created “pinch points” to restrict access to the trails to narrower vehicles. They made extensive use of geocell material to harden boggy portions of the trail, which we are very anxious to monitor for its effectiveness

Figure 27. Big Bear Canyon 50" or less trail entrance – an example of the "pinch point" built to restrict access.

Figure 28. Devil's Pass Motorized Trail – an example of the geocell fabric in use.

Figure 29. Devil's Pass Trail – a trail reroute to shorten the span through a boggy area and get the use out of a meadow.

Figure 30. Devil's Pass Trail – fencing and rocks to block the old route through the meadow – new route to the right.

Laramie Ranger District

- The State continues to groom all the snowmobile trails on the district.
- The District has an agreement with the Medicine Bow Nordic Association to groom over 19 miles of cross country ski trails at least 3 times/week.
- 15 miles of cross country ski trails are groomed by the district at least once per week.
- 65 miles of summer trails were maintained by the district.

RNF

Parks Ranger District

- Summer Trails meeting agency standard are 203 miles out of 271 total miles
- Most of the work done on these trails has been limited to clearing of deadfall and basic drainage work. This clearing has taken up the majority of the crews time, leaving any heavier trail maintenance work undone.
- The majority of this trail maintenance on the district's trails and the construction work on the Continental Divide National Scenic Trail have been accomplished with outside funding from grants or agency earmarks.
- Winter Trails – With the help of the North Park Snow Snakes we have been able to keep 71 miles of marked and groomed winter trails cleared and groomed. An additional 8 miles of marked but un-groomed trails have also been kept clear of deadfall. For a total of 79 miles of winter trails meeting agency standards out of 82 total miles of winter trails.

Hahns Peak/Bears Ears Ranger District

- The district has permits with 3 snow clubs and 1 snowmobile outfitter to provide grooming on all snowmobile trails on the district.
- Volunteers maintained 25 miles of marked ski trails.
- Summer trails were maintained by a combination of district crews and volunteers. The large amount of deadfall on trails this year reduced the number of miles that were cleared.
- Motorized trails were cleared by volunteer groups and by funding from the State for a district motorized trail group.

Yampa Ranger District

- All system trails, motorized and non motorized were maintained to standard.

Recommendations

All districts will have completed travel management and will have a Motor Vehicle Use Map by the end of FY09. Roads and trails need to be signed if they aren't already to let the public know where they are allowed to travel.

Action taken on 2007 recommendations

- Continue to emphasize and utilize partnership programs.
    - Partnership programs with State and private groups continue to play an important role in our trail program.
- Increase education and enforcement efforts to reduce illegal motorized use, both on non-motorized trails and off-road.
    - The "Hot on the Trail" program was implemented on the Douglas District. This program was a major education campaign blitz with posters, presentations and radio information spots.
- Work with the Region and the Continental Divide Trail Association (CDTA) to resolve trail connections across private land.
    - We still do not have access across the private lands in the Muddy Gap area from Rabbit Ears to the east. We have looked at all kinds of options on re-routes but have not found anything suitable yet. We have requested that the Continental Divide Trail Alliance take the lead on obtaining access in this area. The area is not within the forest boundary.
- Implement summer motorized trail system plan for the Laramie Ranger District Eastern Snowy Range Travel Management Decision, which includes trail construction, adoption, and decommission components.
    - Volunteer groups and partnerships are now being formed to develop the trails identified in the travel management decision.

Recreation Infrastructure

Medicine Bow Objective 2.a.4
Routt Monitoring Item 2-2
Reporting Period: Annual

This monitoring item asks the question:

How many trailheads have been rehabilitated or reconstructed over the life of the plan?

Does the Forest Infrastructure (travelways, roads, trails) facilitate attainment of desired recreational experiences, including access, for a wide range of abilities?

MBNF

Brush Creek/Hayden Ranger District

- The South Fork of Big Creek Trailhead was reconstructed at a new location directly adjacent to FSR 496. A new bulletin board was installed and barrier rocks were placed to define the parking area. The trailhead has a native surface. Wooden parking barriers at the Commissary Park Trailhead on the Encampment River Trail were removed and replaced with barrier rock.
- The Rawlins BLM is constructing a new trailhead/parking area on the Forest Boundary where the Continental Divide Trail leaves NFS lands and enters BLM lands. The district is working with the Rawlins BLM to obtain gravel from NFS lands for access road and trailhead surfacing.
- Forest infrastructure (travelways, roads, trails) provide a wide array of recreational opportunities on the District. The district provides ample opportunities for both motorized and non-motorized users including ATV enthusiasts, snowmobilers, hikers, mountain bikers, cross-country skiers, and stock users. Additionally, developed river ingress/egress points allow for access to the North Platte River.

RNF

Hahns Peak/Bears Ears Ranger District

- Two summer trailheads have been rehabilitated due to the effects of the Routt Divide Blowdown. All others have received periodic maintenance.

Parks Ranger District

- Numerous trail heads have been rehabilitated over the life of the plan. This rehabilitation has been limited to maintaining or replacing trail head information boards as needed, and posting of pertinent information. As stated previously, with the number of dead trees that have been removed from all of the trail heads, there is an opportunity to redesign and reconstruct many of these trailheads to better meet the needs of the Forest Service and the forest visitors.
- The Forest infrastructure does an adequate job of providing access for a wide range of abilities and recreational experiences. Some user groups continue to advocate for more miles and variety of trails provided on the district.

Yampa Ranger District

- Work completed at Heart Lake TH, repaired fence, added gravel. Rough Creek trailhead access was improved with the Federal Highway project on Ripple Creek Pass. Federal Highways also added gravel to the Transfer Trail access road, and Vaughn Lake access road. East Fork trailhead toilet and parking area were improved.

Recommendations

Brush Creek/Hayden Ranger District

- Gravel and sign new trailhead for the Big Creek Trail in Holroyd Park.

Hahns Peak/Bears Ears Ranger District

- Prioritize CIP (small-forest level) for rehabilitation of older trailheads.

Yampa Ranger District

- Continue monitoring use to identify needs.

Effects of Off-Road Vehicles

Legally Required Monitoring Item
Medicine Bow Item Subgoal 2.a.
Routt Monitoring Item 1-3
Reporting Period: Annual

This monitoring item asks the question:

What are the effects of vehicle use off roads?

Monitoring Protocol/Data Collected

This item is assessed using field observations, Forest patrol responses, and official law enforcement statistics.

Results/Evaluation

Table 62. Off road vehicle violations FY05-FY07.

Special order area closure to vehicle travel off Forest Development Roads*.	2005		2006		2007		2008	
	MBNF	RNF	MBNF	RNF	MBNF	RNF	MBNF	RNF
Warnings	20	27	18	15	5	3	3	8
Incidents	124	98	105	213	93	54	33	122
Violation tickets	39	6	40	36	13	9	3	15
Total	183	131	163	264	111	66	39	145
MBR Total	314		427		177		184	

* from 36CFR261.56

Medicine Bow NF

Brush Creek/Hayden Ranger District

- A District Motor Vehicle Use Map was available on the MBR Forest website in late 2008. Hardcopy maps are now available.
- The extent of illegal OHV use off of designated travel routes and on non-motorized routes is evident across the District. Illegal use can be broken down into two general categories: recreational use and hunting use. Illegal use in the 'recreational' realm tends to be primarily limited to those areas frequented by ATV users in developed/dispersed camping settings or areas near designated ATV trails. Illegal use associated with hunting is widespread across the district since big game hunting occurs on most parts of the District.
- Recreation personnel spent a significant portion of time checking for ATV registration compliance throughout the summer and fall seasons.
- Recreation personnel targeted the Cedar Pass/Pennock Mountain area for off road ATV patrols during the fall big game hunting season. Repeated patrols in the area resulted in a dramatic decrease in illegal ATV use. However, illegal use was still evident in some locations.

Douglas Ranger District (Laramie Peak)

- Recreation riders (as opposed to hunters) continue to be a growing user group, with and more frequent off-roading activity.
- Patrolling during hunting season has proven very effective as there were very few off road incidents witnessed, and only one violation notice issued during the entire fiscal year.
- Our relationship with the Wyoming Game and Fish wardens continues to be an effective tool in education and enforcement for off-road issues.

Routt NF

Hahns Peak/Bears Ears Ranger District

- Travel management issues increased in 2008, including non-system trails and roads, impairment of riparian areas, dispersed campsites too close to streams and water bodies.

Parks Ranger District

- The motor vehicle use map (MVUM) for the Parks District has been available for about 1 ½ years now providing information to the public where open motorized routes are located. User-created trails will still be a fixture on the landscape until they can be physically eliminated.
- Principal areas of OHV use are district wide. The use is throughout the summer and especially during the fall hunting seasons.
- Problems arise as people venture off the existing motorized routes and create new routes. There are still incidents of motorized use on some of our non-motorized trails (trails 1135, 1187, and 1197).

- The trail crews are working in some of these key areas, but it is often difficult to catch anyone in the act. The District has done saturation patrols on the busy weekends in these same problem areas, in addition to hunter patrols in the fall to inform and educate motorized recreation users.
- The Colorado Off Highway Vehicle Coalition, Front Range Trail Riders and Northern Colorado Trail Riders are all good partners and have been helpful with peer pressure.
- Resource concerns would include the proliferation of illegal user created routes. All of which can lead to erosion, damage to sensitive plants and disturbance of wildlife.
- Snowmobile use in the Mount Zirkel Wilderness continues to be a problem. Snowmobile patrols in these areas need to be made a priority for the district and allocate funding and personnel as appropriate.
- There are a number of motorcycle enthusiasts that continue to violate the seasonal closures in the Willow Creek area, and continue to ride the trails while they are closed during the big game hunting seasons each fall.
- Our Continental Divide Trail crew also witnessed tracks of motorcycles riding on newly constructed sections of the non-motorized CDNST. Even when the new tread construction ended the motorcycles kept riding cross country following the flag line of the trail that had not yet been constructed.

OHV Use Effects on Plants and Rare Plant Habitat

OHVs are restricted to roads and trails on both the MBNF and RTNF. Law enforcement reports indicate that while OHV use off of roads occurs across the forest, it is more of a consistent problem in some areas (e.g. Pole Mountain).

When OHVs travel off of designated routes, the vegetation (common or rare) is crushed, shredded or removed. In addition, soil erosion and sediment that is transported can bury plants (Weaver and Dale 1978).

OHVs are documented to transport noxious weeds and non-native invasive plant species into new areas (Ferguson et al. 2003, Gelbard and Belknap 2003), where these unwanted species are likely to find suitable disturbed habitat to establish new populations. This can change plant community composition and fire regimes (Ferry et al. 1995).

OHV use can affect the presence of pollinators that are needed by rare plants (Weiss 1999). Pollinators are negatively influenced by the fragmentation produced by motorized use (Bhattacharya et al. 2003). Motorized use can change soil properties and infiltration of precipitation thus changing the growing environment for plants (Trimble and Mendel 1995).

In wetlands and fens, the soil is organic and provides very little support for the OHV, which allows the machine to sink into soil or peat and results in a deep rut. These ruts then change the water supply to the organic soil or peat and to the surface vegetation. The ruts can cause the wetland or fen to drain or just create localized hydrologic changes. Fens are very slow to recover and ruts can last 10-1000+ years (Lee and Boutin 2006, Pryor 1998).

Recommendations

Brush Creek/Hayden Ranger District

- Continue patrols in the Cedar Pass/Pennock Mountain Area during hunting season but to a more limited extent. Identify new area for intense ATV patrol during upcoming big game hunting season.
- Complete closure of illegal routes.

Hahns Peak/Bears Ears Ranger District

- Adequately fund travel management/motorized recreation monitoring.

Parks Ranger District

- Continue to encourage FPO's on each district.

Action taken on 2007 recommendations

- Continue to work with the state to increase education of OHV riders when they register their vehicles
    - A new program with Wyoming State called 'Hot on the Trail' is being implemented to provide a message to OHV riders of the impacts from use.
- Conduct patrols in OHV problem areas throughout the season of use.
    - Patrols have been stepped up on the problem areas of the grasslands during the spring and summer rather than just in the fall.
- Look for opportunities to increase funding for physical closure of illegal routes and damaged areas.
    - State funding has been used from Wyoming to repair damaged areas.
- Evaluate existing ATV trails with livestock management conflicts and consider whether seasonal restrictions would be appropriate to reduce conflict.
    - No action was taken on this issue this summer.
- Continue to use funds from the Wyoming state trails program, for increased monitoring and enforcement on ATV trails.
    - Douglas District has doubled their grants from Wyoming State for OHV enforcement.

Scenery

Routt Monitoring Item 2-4
Reporting Period: Annual

This monitoring item asks the question:

How are projects and programs affecting visual quality?

Monitoring Protocol/Data Collected

The effects of management on visual resources are assessed through field evaluation of Forest Service activities. Three timber sale projects were selected for monitoring: Two Bull and Bearclaw Timber Sales on the Hans Peak-Bears Ears Ranger District (HPBE) on the Routt NF

and the Singer Peak Timber Sale on the Brush Creek/Hayden Ranger District on the Medicine Bow NF. The Big Creek Ridge Prescribed Burn project on HPBE was also evaluated.

Results/Evaluation

RNF

The effects of management on visual resources are assessed through field evaluation of Forest Service activities. Hahns Peak Lake CG and Hinman CG located on the Hahns Peak-Bear Ears (HPBE) District , and the Eastern Snowy Range Road Decommissioning Project, were reviewed and evaluated for FY2008. Pine beetle killed trees were salvaged and removed within both campgrounds for public safety and to protect campground facilities and amenities. Both campgrounds are situated within MA 4.3 with emphasis on dispersed recreation. The adopted visual quality objective is Partial Retention. Non-infested young lodgepole pine trees and multi storied spruce/fir trees were retained to provide forest appearance and shade and screening for present and future campers between camp sites in the Hahns Peak CG. Hinman CG has more open appearance than the Hahns Peak Lake CG due to the smaller number of tree stands remain after harvest. Slash was cleaned up and slash piles within both campgrounds will be burned when snow is on the ground in late fall or early winter. Both campgrounds appear as Modification VQO due to the noticeable change of the landscape resulted through the salvage operation. Volunteers planted 600 seedlings last fall within the Hinman CG which would provide future shade and screening and enhance landscape aesthetics. Hahns Peak CG will be reconstructed next summer and after the completion of campground reconstruction, planting of seedlings will also be implemented. When new trees grow to the height of five feet and higher, both campgrounds would appear as Partial Retention VQO and move toward the desired landscape character and desired recreation setting.

MBNF

The MBR monitoring ID team and Laramie District staff reviewed the Eastern Snowy Range Travel Management road decommissioning. Roads that were decommissioned on the Laramie District in FY 2007 and FY 2008 near Wyoming State Highway 230 were reviewed. Earth berms were used to close and decommission unneeded roads. Two unneeded roads were decommissioned within the foreground of State Highway 230 which is a high concern scenic travel route. The two decommissioned roads are located within MA 5.15 with emphasis on Forest Products, Ecological Maintenance and Restoration Considering the Historic Range of Variability. The adopted scenic integrity objective is moderate in the foreground of arterial/collector roads and primary trails and Low in all other areas. The desired condition for MA 5.15 states that management activities produce a wide variety of forest products while providing forage production, scenic quality, wildlife habitat, recreational opportunities and a variety of other goods and services. The earth berm closure method created an unnatural appearance due to raw earth piles that contrast with the surrounding landscape. The two decommissioned roads appear as Unacceptable Low scenic integrity when viewed from Highway 230. Fresh green slash was later put on the top of exposed dirt as to camouflage the dirt but this is a short-term fix. Unacceptable Low scenic integrity refers to landscapes where the valued landscape character being viewed appears extremely altered. Both decommissioned roads adjacent to State Highway 230 are needed to be rehabilitated to meet Moderate Scenic Integrity Objective (SIO). Decommissioning roads within the foreground of high and moderate scenic concern travel routes (roads and trails) through scarifying, recontouring and seeding the old roadbed and landscaping with large rocks and planting trees and/or shrubs would meet Moderate SIO and moves toward the desired condition on scenery.

The East Snowy Range TM road decommissioning team will coordinate with the Forest landscape architect on decommissioning unneeded roads located within the foreground of high and moderate scenic concern Forest travel routes and within recreation areas in FY 2009 season.

Wilderness Opportunities

Medicine Bow Item Objective 2.b.1
Reporting Period: Five Year

This monitoring item asks the question:

How many areas recommended for wilderness provide SPNM opportunities?

Results/Evaluation

Brush Creek/Hayden Ranger District
All areas recommended for wilderness on the District provide SPNM opportunities. The Verde Mine (858) and Roaring Fork (860) non-motorized trails are located south of Huston Park Wilderness are in two areas recommended for wilderness. In the Rock Creek area near Arlington the following non-motorized trails are located in areas recommended for wilderness: Crater Lake (105), Rock Creek (106), Lookout Mtn. (107), and Stud Creek (104).

Wilderness Monitoring Plans

Medicine Bow Item Objective 2.b.2
Reporting Period: Five Year

This monitoring item asks the question:

To what extent have monitoring plans been developed and implemented for elements critical to maintaining ecological conditions?

Results/Evaluation

Brush Creek/Hayden Ranger District

- One leafy spurge site was treated with herbicide annually and monitored near the Waterfall North campsite along the North Platte River in the Platte River Wilderness from 2002-2005.
- MIS random sampling for brook trout takes place in the Huston Park Wilderness to monitor watershed function via fish populations. Additionally, Colorado River Cutthroat trout are monitored in Huston Park Wilderness in a collaborative effort between the Forest Service and Wyoming Department of Game and Fish.

Parks Ranger District

- The Parks District has implemented the MBR's Wilderness weeds plan to identify and treat weeds in the Mount Zirkel Wilderness. We have a Wilderness education plan, and have a Fire Plan that addresses fire in the Wilderness.

Recommendations

Update the wilderness implementation schedules on the Parks district and work on single unit management agreements.

Wilderness Rehabilitation

Medicine Bow Item Objective 2.b.3
Reporting Period: Five Year

This monitoring item asks the question:

What is the Forest doing to ensure the rehabilitation of heavily impacted campsite areas?

Results/Evaluation

Brush Creek/Hayden Ranger District

- The campsites observed in the Encampment River Wilderness have very limited impacts. Likewise the campsites in the Platte River Wilderness see limited use due to typically short river seasons and very limited overnight use.
- The District had a permanent wilderness ranger and active wilderness campsite restoration program from 2002-2005. However, due the position being vacated, budget cuts, and district personnel reorganization the position remains vacant. Subsequently, wilderness campsite restoration efforts have been curtailed since 2005.
- During the current reporting period (2004-2008) 32 wilderness campsites have been rehabilitated in three wilderness areas.

Table 63. BCH wilderness campsite rehabilitation

Year	Platte River Wilderness Campsites	Encampment River Sites	Huston Park Sites
2004	1	16	0
2005	3	9	3

Parks Ranger District

- Heavily impacted campsites have been rehabilitated in the Wilderness, but most of the time these are illegal sites that are either too close to the trail, a body of water, or both. Rehabilitation techniques include removing fire rings, planting grass plugs, planting seedling trees, and planting rocks in an effort to naturalize the area and discourage future use of the area.

Yampa Ranger District

- Campsite inventory completed in 2005 for Flat Tops and Sarvis Creek. Illegal campsites were rehabilitated.

Recommendations

Brush Creek/Hayden Ranger District

- Reinitiate wilderness campsite monitoring and rehabilitation.

Yampa Ranger District

- Continue to inventory and complete rehabilitation as needed

Protected Areas

Medicine Bow Item Objective 2.b.4 & 5
Reporting Period: Five Year

This monitoring item asks the question:

To what extent have heritage resource sites been inventoried, interpreted and protected?

Results/Evaluation

With the signing of two Programmatic Agreements, one in WY and one in CO, the forests have moved towards developing an effective and efficient inventory strategy which is being used to identify and evaluate heritage resources. The development of these programmatic agreements was done collaboratively with the states and with Tribal consultation. Monitoring has shown that identified resources are being inventoried and significant properties protected. The Forests has not had the funding to move towards increasing the number of our interpreted sites.

Livestock Use

Medicine Bow Item Objective 2.c.2
Frequency of Measurement: Annual
Reporting Period: Annual

This monitoring item asks the question:

What levels of grazing use are permitted while still meeting or moving toward desired vegetative condition?

Monitoring Protocol/Data Collected

Animal Unit Months (AUMs) grazing use for the year and Head Months (HMs) grazing use for the year. Displayed for cattle and for sheep and for total livestock.

Results/Evaluation

MBNF
Southeastern Wyoming once again received less than average winter precipitation. Spring rains were better in some areas; however, amounts were highly variable across the landscape and much of that rain came too late to produce good forage levels. The spring stayed unseasonably cool into early summer and, as a result, the seasons were considerably shortened, especially for the sheep allotments on the Sierra Madre range. Many areas did receive more frequent, but highly scattered, summer showers that resulted in the vegetation remaining green a little later in the season than it has in some of the recent years. Laramie Peak had very little winter snowpack and only sporadic rain.

Being the eighth consecutive year of this prolonged and severe drought, quite a few operators across the Units went home early, and large numbers went on late. Still about 1/3 of the producers have not replaced their depleted herd numbers, waiting for land and water resources to better recover before doing so. Lower outputs result from the non-use for resource protection. The amount of grazing use on the Medicine Bow was only about 39% of the projected Forest Plan level for sheep allotments (about half of the 2007 levels because of the late, cool spring) and only about 74% for cattle allotments.

RNF

The year 2008 was the eighth consecutive year of this extended drought, but the Routt NF was, once again, in far better shape than much of the rest of Colorado; in fact, most of the Routt has shown only minor effects since the start of the 2004 season. Winter snow packs have been at or above average for 2 of the last 3 years.

Most operators were able to run a majority of their permitted numbers; many have not yet fully replaced all of their herds sold off in earlier years, taking partial non-use for resource protection. Some went on a little later than normal, some came off early. All of these efforts are good examples of proper rangeland vegetation management techniques – reducing livestock commensurate with the level of forage production and water availability, and allowing rangelands to recover from previous drought conditions. Cattle allotments were stocked at 75% of capacity and sheep allotments were stocked an average of 72% of capacity.

Table 64. Planned and actual livestock use during 2008.

	Unit of Measure (in thousands)	Planned Level	2008 Level	Percent of Planned Level
RNF				
Active Allotments	Allotments	126	126	100%
Sheep Grazing	Head-Months	174	125.0	72%
	AUMs	52.5	36.8	70%
Cattle Grazing	Head-Months	39.6	29.7	75%
	AUMs	49.5	36.2	73%
Total Grazing	Head-Months	214	154.7	72%
	AUMs	102	73.0	72%
MBNF				
Active Allotments		104	104	100%
Sheep Grazing	Head-Months	42	16.4	39%
	AUMs	12.6	4.5	36%
Cattle Grazing	Head-Months	57	42.4	74%
	AUMs	74	46.7	63%
Total Grazing	Head-Months	99	58.9	59%
	AUMs	86.6	51.2	59%

Range Management Program Accomplishments

The following tables display the accomplishments of the range program during the life of the current forests' plans.

Table 65. Planned and actual livestock use (thousands of head-months)

Year	Routt Planned	Routt Produced	Percent	Medbow Planned	Medbow Produced	Percent
1999	214.0	185.4	87			
2000	214.0	184.1	86			
2001	214.0	172.3	81			
2002	214.0	175.2	82			
2003	214.0	189.8	89			
2004	214.0	154.2	72	99.0	58.5	68
2005	214.0	209.0	98	99.0	86.2	87
2006	214.0	160.7	75	99.0	71.1	72
2007	214.0	154.4	78	99.0	60.4	80
2008	214.0	154.7	72	99.0	58.9	59
Average		174.0	81%		67.0	68%

Table 66. Allotment acres administered to standard.

Year	Routt Included	Routt Inspected	Percent	Medbow Included	Medbow Inspected	Percent	Total NFS Acres	Percent
2004	993,335	862,791	87	1,545,582	1,080,659	70	1,943,450	77
2005	993,335	846,067	85	1,545,582	967,736	63	1,813,803	71
2006	993,335	689,221	69	1,545,582	1,332,705	86	2,021,926	80
2007	993,335	490,206	49	1,545,582	1,050,824	68	1,541,030	61
2008	993,335	559,349	56	1,545,582	1,049,074	68	1,608,423	63
Average		689,527	69%		1,096,200	71%	1,785,726	70%

Recommendations:

Continue to report actual grazing use each year in relation to the planned level, and explain in the narrative section the annual climatic fluctuations that account for the differences.

Due to changes in how the US Forest Service tracks budget and finance, costs are tracked for all three units (the Medicine Bow and Routt NFs and Thunder Basin National Grassland) as a unit and cannot be allocated to individual units.

Big Game

Medicine Bow Item Objective 2.c.3
Reporting Period: Three Year

This monitoring item asks the question:

What levels of big game use can be provided for while still meeting or moving toward desired vegetative condition?

Monitoring Protocol/Data Collected

This is a review of the Medicine Bow National Forest's interactions with the Wyoming Game and Fish Department (WYGF) on matters related to establishing big game herd objectives and population management tools that compliment vegetation conditions on the Forest.

Results/Evaluation

Wildlife biologists from all three ranger districts of the MBNF regularly attend interagency meetings with WYGF to discuss big game herd objectives, current population levels, and proposed hunting season regulations. Current habitat conditions for big game in these areas are a topic of discussion at these meetings. Forest service personnel are provided the opportunity to comment on changes to big game herd objectives. In general, the current elk herd populations that overlap with the MBNF remain well above their established herd objectives, while those for mule deer are at or near the established herd objectives.

Recommendations

Continue to meet regularly with WYGF to collaborate on big game herd objectives and to work cooperatively on population and habitat management tools that assist in attaining those objectives. Focus on gathering vegetation data in important big game areas and elsewhere on the MBNF in order to evaluate the impacts of current big game population levels and livestock grazing on desired habitat and vegetation conditions. Evaluate and summarize this data in areas where we believe big game populations are having an impact of desired conditions on the Forest in order to present it to participants at these interagency meetings.

This monitoring item has a 3 year reporting interval, but is recommended to change this to be reported every 5 years.

Miscellaneous Products

Medicine Bow Item Objective 2.c.4
Reporting Period: Five Year

This monitoring item asks the question:

How do we provide for the environmentally responsible harvest of "special products," such as mushrooms, floral products, and medicinal plants and be responsive to the cultural plant needs of American Indian Tribes

Monitoring Protocol/Data Collected

Project level analysis and the number of special forest product permits issued are used to monitor this item.

Non-market products are issued as personal use permits to the public by the district and forest offices and by the Regional Office. These products are not sold competitively and are issued for personal use, rather than commercial re-sale.

The MBR LRMPs identified that an objective of management was to provide appropriate opportunities to satisfy demand for miscellaneous products (special forest and grassland products, such as mushrooms, floral products and medicinal plants) through environmentally responsible harvest and collection methods on NFS Lands.

The MBR receive a number of requests for the collection of floral products, seed collection, and/or medicinal plants. Each request is addressed and analyzed for effects on sustainability of populations and collection methods. Where conditions were met, appropriate permits for collection were issued. Each permit contains information on which plants can't be collected and limits on the amount that can be collected. The Rocky Mountain Regional Office (RO) also issues permits that cover all R2 forests and grasslands. These permits include a list of T/E/S plants that can't be collected. When needed, the MBR contact these permittees and with information about plant species of local concern that can't be collected on the MBR.

Results/Evaluation

Proposals for collection of special forest products were analyzed for effects on sustainability of populations and collection methods. Where conditions were met, permits for collection were issued.

The demand for miscellaneous products has been accommodated. The MBR issued 3 permits for collection of miscellaneous products connected with research activities. The Regional Office (RO) issued 11 permits for collection of botanical materials. When the RO issues a permit, it covers all NFS lands within the Rocky Mountain Region. It is unknown if any of the permittees actually visited or collected from the MBR. At least one of the permittees has been known to collect from the MBNF in the past.

There were no requests that where the potential permittee identified themselves as tribes or tribal members and there were no permits issued to tribes or tribal members.

Under the terms of the permits, the products were collected in an environmentally sound manner and at levels determined.

All actions were consistent with the goals and objectives in the plans.

Recommendations

Continue to monitor this item. There were no changes to the plan identified as needed.

Snowy Range Scenic Byway

Medicine Bow Item Objective 2.c.5
Reporting Period: By Year Ten

This monitoring item asks the question:

How do we protect the values for which the Snowy Range Scenic Byway was designated?

Results/Evaluation

Brush Creek/Hayden Ranger District

- Projects that are proposed in the Snowy Range Scenic Byway Corridor are subject to review and input from all members of the District interdisciplinary team. The appropriate review determines with projects or project components may conflict with the inherent values of the Snowy Range Scenic Byway. Design features are routinely applied to projects to insure those inherent values are protected.

Recommendations

- Complete the final phase of issuing a special order to eliminate dispersed camping and campfires within 500 feet of the centerline of the Snowy Range Scenic Byway.
- Continue Interdisciplinary Team review of all projects along the Snowy Range Scenic Byway Corridor.

Research Natural Areas

Medicine Bow Item Objective 2.c.6
Reporting Period: Five Years

This monitoring item asks the question:

To what extent have establishment reports been developed?

Monitoring Protocol/Data Collected

Results/Evaluation

Establishment reports have not yet been developed for any of the RNAs or SIAs on the MBR.

RNAs with LPP vegetation will have changes due to the MPB epidemic. How this affects the purpose of the RNA depends upon the purpose and function of the RNA, and whether it was dependent upon LPP forest.

Conclusions

With the change in vegetation conditions, these areas should continue to provide the above basic functions with the exception of the following function for the species which rely upon late seral forest vegetation:

> ***Preserve and maintain genetic diversity, including threatened, endangered, and sensitive species.***

NFS Natural Research Area Policy (FSM 4063.03) indicates that "Unless catastrophic circumstances significantly alter the conditions for which a Research Natural Area was originally created such that it no longer may serve that function, the designation of a Research Natural Area shall be in perpetuity." Although the death of lodgepole pine will cause changes in the tree cover of the different research natural areas, they will still be able to function for study and baseline conditions. If there are threatened, endangered or sensitive species whose habitat includes large live lodgepole pine, those species may no longer find suitable habitat within the RNAs.

The RNAs will still be consistent with the desired conditions specified in both forest plans:

Recommendations

Remove dead trees from around historic resources in SIAs to reduce risk of damage from falling trees.

Use RNAs for interpretation of the changes to the forest from the MPB where there is substantial mortality of lodgepole pine (note: no signs should be installed within RNAs).

To meet Objective 6 under Subgoal 2c of the MBNF LRMP:

- For RNAs without completed establishment reports (6), continue to pursue completion of these reports and to prepare management plans (9) in conjunction with Rocky Mountain Research Station.
- Continue to complete species inventories in RNAs .

Land Ownership

Medicine Bow Item Objective 2.c.7
Reporting Period: Five Years

This monitoring item asks the question:

How do we respond to public need in the area of land ownership adjustments (exchanges, etc.)?

The MBR has taken a proactive approach responding to public needs in the area of landownership adjustment by utilizing exchanges, interchanges (Small Tracts Act), and through the Pilot Conveyance Program. We have significantly reduced deferred maintenance costs to the government by selling unneeded or underutilized facilities. We have eliminated in-holdings through exchanges and reduced title conflicts by utilizing the interchange and encroachment categories of the Small Tracts Act. Additionally, the MBR has developed a list of priority in-holdings that they would like to acquire.

Table 67. Land ownership adjustments 2003-2008.

Small Tracts Acts and Rights of Way Acquisitions				
Name	Type	District	Category	
Icebox	Small Tracts Act		Encroachment	
LaBenz	Small Tracts Act		Encroachment	
Gunnerson	Small Tracts Act		Encroachment	
Leighton	Small Tracts Act		Encroachment	
Jones	Small Tracts Act		Encroachment	
Williams	Small Tracts Act		Right-of-Way	
Gruber	Small Tracts Act		Right-of-Way	
Land Exchanges			**Acres Exchanged**	**Acres Received**
Bragg	Land Exchange	Laramie Dist.	20.0	39.93
Miles	Land Exchange	Yampa Dist	90.14	83.44
Big Creek	Land Exchange	Hahns Peak	760.0	507.44
Mann	Land Exchange	Hahns Peak	84.88	147.51
U of Nebraska	Donation	Hahns Peak		
Conveyances			**Funds Received**	
10th Street Office		Hahns Peak	$585,000	
Kremmling Office		Parks	$230,000	
Encampment Office		BCH	$415,000	

Rights of Way Acquisition

Medicine Bow Item Objective 2.c.8
Reporting Period: Five Years

This monitoring item asks the question:

To what extent has a rights- of- way acquisition program been developed in consideration of all program areas?

The MBR has started to prioritize rights-of-way (ROW) acquisition needs that were determined as a result of completing travel management decisions. These needs were prioritized to enhance management of public lands and as a result, beneficial to all program areas. However, the bark beetle epidemic has forced the forests to shift priorities and concentrate on ROW needs relative to fuel reduction projects and wildland urban interface projects. It is anticipated that these type of projects will remain a priority for the next 3-5 years.

Harvested Land Adequately Restocked

Legally Required Monitoring Item
Medicine Bow Subgoal 2.c.
Routt Monitoring Item 1-10
Reporting Period: Annual

CFR 219.27 requires a determination of compliance with the Forest and Rangeland Renewable Resources Planning Act of 1974 that lands when harvested to achieve timber production are adequately restocked within 5 years after final harvest as specified in the Routt and Medicine Bow National Forest Land & Resource Management Plans.

In addition, this monitoring item asks the question:

Are stands adequately restocked within 5 years of final harvest treatment?

Monitoring Protocol/Data Collection

The yearly monitoring report relies on the FACTS database to list stands and acreages that had final harvest 5 years prior, and which of those stands and acres have a regeneration certification code. If a harvested stand is adequately restocked, but lacks the regeneration certification code in the database, the stand is considered not adequately stocked.

Results/Evaluation

According to CFR 219.27(c)(3) “When trees are cut to achieve timber production objectives, the cuttings shall be made in such a way as to assure that the technology and knowledge exists to adequately restock the lands within 5 years after final harvest”. Final harvest is defined as “clearcutting, final overstory removal in shelterwood cutting, seed tree removal in seed tree cutting, and selection cutting for a regeneration purpose”. “Research and experience shall be the basis for determining whether the harvest and regeneration practices planned can be expected to result in adequate restocking”.
The process for monitoring 5 year restocking success is scheduling and recording the results of regeneration (restocking) surveys in the FACTS database. If a regeneration survey indicates a

lack of seedlings, the district can schedule planting or seeding with scheduled regeneration surveys to monitor restocking success.

Table 68. 2008 Acres not adequately stocked.

Forest	Final Harvest (acres)	Acres not Adequately Restocked
Medicine Bow	132	0
Routt	76	0

MBNF
132 acres harvested, All acres are adequately stocked within 5 years for a failure rate of 0%, 100% success restocking.

RNF
76 acres harvested with a final harvest, all acres are adequately stocked within 5 years, for a failure rate of 0%, 100% success restocking.

Costs

Legally Required Monitoring Item
Medicine Bow Subgoal 2.c
Routt Monitoring Item 3-2
Frequency of Measurement: Annual
Reporting Period: Annual

These monitoring items ask the questions:

Are costs of implementing programs occurring as predicted in the Supplemental Table S-3 of the FEIS?

Due to changes in how the US Forest Service tracks budget and finance, costs are tracked for all three units (the Medicine Bow and Routt NFs and Thunder Basin National Grassland) as one and cannot be allocated to individual units. Forest allocation for the years 2003 through 2008 are displayed in Figure 31. Not shown on the graph are supplemental funds the forest received for aquatic organism passage ($72,000), capital improvements for facilities roads and trails ($1,476,000) and for conveyance of facilities ($202,700). Funds received through partnership are tracked under the Partnerships monitoring item below. Individual program budgets for the Range and Watershed / Fisheries programs can be found in the relevant monitoring items.

Over the past 5 years, budgets have mostly stayed steady or decreased, with the exception of forest products and hazard fuels funds, which increased in 2008. The forests also received more funds in 2008 from the legacy roads funds (formerly roads and trails funds) than it had in previous years.

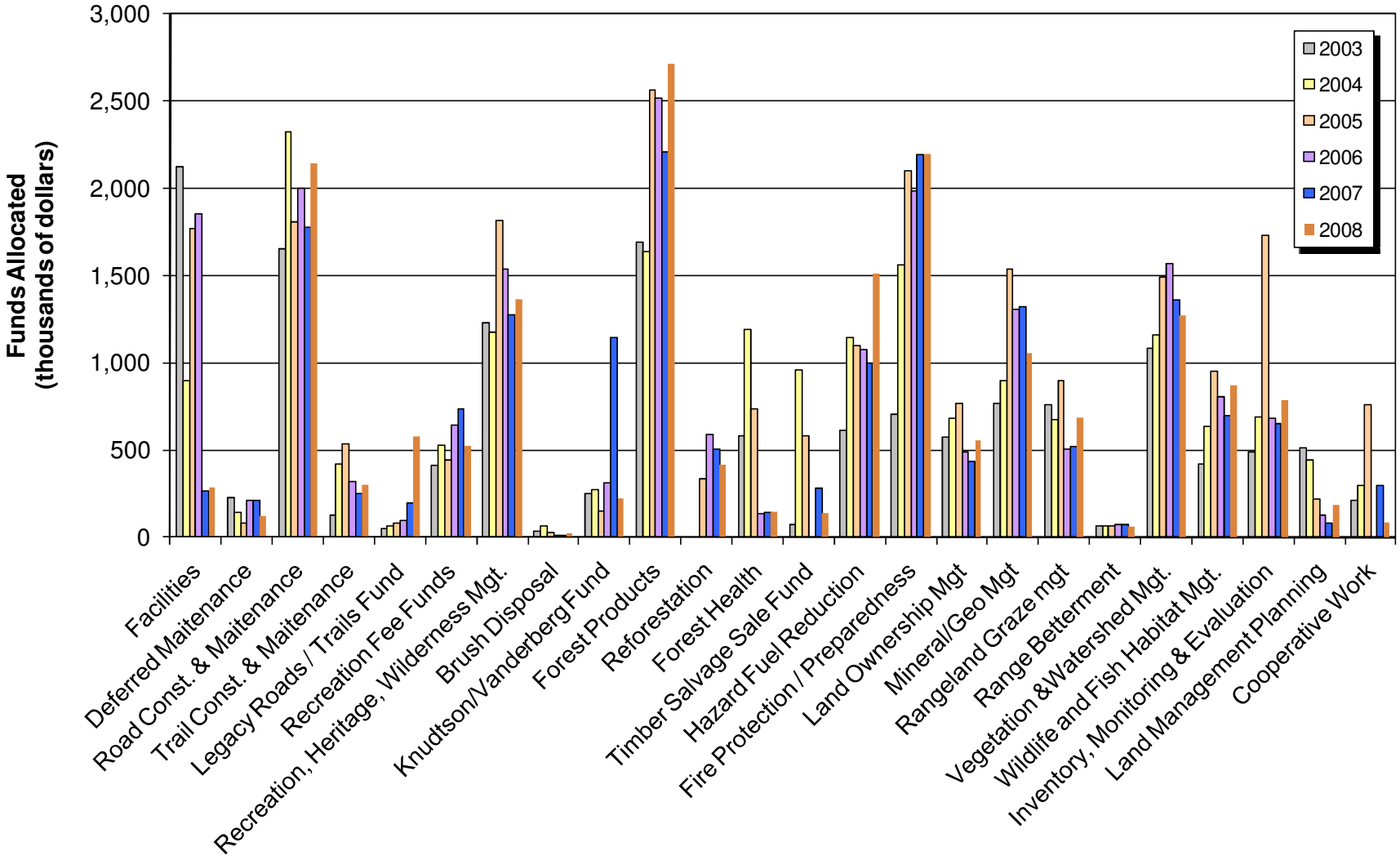


Figure 31 Allocated budget for Medicine Bow - Routt NF, Thunder Basin National Grassland for fiscal years 2003 to 2008

Comparison of Estimated and Actual Outputs and Services

Legally Required Monitoring Item
Medicine Bow Objective 2.c.1
Routt Monitoring Item 3-1
Measurement: Annual
Reporting Period: Annual

This monitoring item asks the question:

Are outputs of goods and services being produced at a rate consistent with the projections in Supplemental Table S-2 of the FEIS?

The Forest Service output reporting is in transition, making it difficult to report outputs that can be compared to previous years for the two Forests. A further complication is the difficulty in comparing the categories of outputs in S-2 tables in the EISs for the two forest plans and in comparing these categories to the current target and outputs currently reported for NFS administrative purposes. Outputs are reported in monitoring items as appropriate and feasible, such as in the monitoring items for water quality, livestock grazing and facilities.

Communities

Legally Required Monitoring Item
CFR 219.7(f) Medicine Bow Subgoal 2.c
Routt Monitoring Item 3-3 & 3-4
Reporting Period: Five Year

These monitoring items ask the questions:

How are forest management activities affecting land, resources and communities adjacent to the National Forest?

How are forest management activities affecting local employment and income?

How well is the Forest interacting and planning in cooperation with communities?

Forest Management and Communities

MBNF

Portions of the Medicine Bow National Forest are within six different counties: Laramie, Platte, Albany, Carbon, Converse and Natrona. The Medicine Bow National Forest is rich in history, culture and recreational opportunities. A state-wide advertising campaign has brought more tourists and recreationists to the area. During the past decade, the Forest website has been populated with extensive recreational information, making it easier for people from all parts of the nation to plan an experience on the forest.

A 2002 Wyoming Department of Agriculture Public survey found that residents' foremost expectations for the management of the National Forests were; to make sure it is available for future use; provide and protect water sources for human use, and to provide a healthy home for wildlife. Livestock grazing, timber production and mineral production were the bottom three items on the ten item list.

Forest efforts to reduce fuel hazards created by beetle-killed trees have prompted adjacent landowners to do fuel reduction on their own properties. The Forest's educational efforts about fire hazards and falling tree hazards have promoted individuals to remove their dead trees to reduce these risks.

Timber management activities have improved and relocated roads and trails and protected water resources and cultural resources. Public involvement in the planning of beetle-related projects has strengthened community relationships.

An active range program contributes to livestock operations for area ranchers.

The protection of watersheds, water rights and water uses has become a hot topic as more entities compete for the area's water resources. The Forest Service participates in working groups to help sort through some of these issues, and to encourage the wise us of water resources.

Forest personnel continue to work cooperatively with adjacent land owners and local governments on issues/projects such as noxious weeds, aquatic and terrestrial wildlife habitat, emergency preparedness, travel management, recreation, and watershed improvement projects.

Recent economic changes coupled with climate change recognition have spawned interest in such business ventures as pellet plants, bio-fuel and bio-energy production, wind energy, and cloud seeding.

The Forest Service is taking the lead in utilizing renewable energy. The Brush Creek-Hayden Ranger District is part of a handful of places in Region 2 where the Forest Service is installing vertical axis wind turbines to help provide energy to offices and to feed it back to the grid if more is produced than needed.

Numerous local individuals and 72 outfitter/guides benefit from hunting, fishing and other recreational activities on the Routt National Forest.

RNF

Routt County has experienced rapid growth in past decade or so, mostly in the Steamboat Springs area. According to the Yampa Valley Partners Community Indicators Project 2009-2010 Report, this growth is driven by an increasing number of people moving into the area for a lifestyle rich in natural, recreational and cultural amenities. About 40 percent of Routt County, 31 percent of Jackson County, 1.2 percent of Moffat County and 22.3 percent of Grand County lies within the Routt National Forest, which offers a wide range of well-managed, all-season recreational activities, including a world-class downhill ski area, and fishing and hunting opportunities. An increasing number of full-time and part-time residents do not depend on economic activity occurring in the region to make their living. The number of people making their living from agriculture is declining, according to the Indicators Report.

Forest efforts to reduce the fuel hazards created by beetle-killed trees have prompted adjacent landowners to do fuel reduction on their own properties. The Forest's educational efforts about fire hazards and falling tree hazards have promoted individuals and entire subdivision to work together removing dead trees to reduce these risks.

Geographic area timber management activities have improved and relocated roads and trails, and protected water resources. Public involvement in the planning of these beetle-related projects has strengthened community relationships.

An active range program contributes to livestock operations for area ranchers, although some ranches have been sold for subdivisions.

The protection of watersheds, water rights and water uses has become a hot topic as more entities compete for the area's water resources. The Forest Service participates in working groups to help sort through some of these issues, and to encourage the wise use of water resources.

Forest personnel continue to work cooperatively with adjacent land owners and local governments on issues/projects such as noxious weeds, aquatic and terrestrial wildlife habitat, emergency preparedness, travel management, recreation, and watershed improvement projects.

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Numerous local individuals and 51 outfitter/guides benefit from hunting, fishing and other recreational activities on the Routt National Forest.

Local Employment and Income

MBNF
About 2/3 of timber sales on the Medicine Bow National Forest in the past several years were purchased by Intermountain Resources of Montrose, Colorado. Bighorn Lumber in Laramie bought a small number of sales. Pittington Sawmill in Walden also purchased a few small sales from the Medicine Bow.

The Medicine Bow also has a number of post and post sales to smaller operators in the area.

Due to the national and global economic downturn and drastic reduction in home building, the lumber market is the poorest it has been in decades. Bighorn Lumber in Laramie, which employs about 67 people, closed in 2009. Intermountain Resources, which employs about 100 people at the mill, and a significant number of loggers, is also experiencing market declines.

Saratoga, Wyoming is one of many western communities economically impacted by consolidation, automation and the changing business practices of multinational timber companies. The town's largest private employer, a sawmill operated by Louisiana Pacific, closed in 2003. The town's two largest employers now are the United States Forest Service and Carbon County School District No. 2, both public sector employers.

The Saratoga sawmill has been mothballed since Louisiana Pacific closed it in 2003. It was then bought by Intermountain Resources.

Because of the amount of dead trees, the Medicine Bow National Forest is getting a lot of interest from the woody biomass industry.

People come to the forest year round for the vast recreational opportunities. Visitation has increased over the past 10 years. As population in metropolitan areas increase more people are willing to travel further for the quality of experience and solitude they seek from National Forest System Lands. People who come to the forest for recreation often stay in local communities, making numerous purchases and contributing to the economy.

A Forest Facilities Master Plan was developed to identify deferred maintenance, facilities excess to our needs, and actions for addressing these issues. The Encampment ranger station compound and all facilities associated with it are just some of the facilities identified as excess to our needs and having excessive deferred maintenance issues.

The Medicine Bow National Forest employs about 113 permanent employees, and an additional 75 seasonal employees each year, some from the local workforce and some from other areas. These employees live and work in the local communities contributing to local economies.

RNF

A number of small businesses have sprung up in response to the beetle epidemic, mostly to do fuel reduction/hazard tree mitigation. However, these new businesses are primarily working on private land.

The past few years have seen the addition of two pellet mills in Walden and Kremmling, and one medium sized sawmill in Steamboat Springs. So far, these businesses are utilizing abundant beetle-kill trees from private land. When these sources are exhausted, it's expected the businesses will need trees from the National Forests. Walden also has a medium-sized sawmill which has been in existence for several decades. The Walden mill has not bought a timber sale from the Forest Service for about four years, but is utilizing beetle-kill from private land.

All of the timber sales on the Routt National Forest have been bought by Bighorn Lumber in Laramie, Wyoming, or Intermountain Resources in Montrose, Colorado. For the past two years, these companies employed a number of loggers and log-truck drivers, some local and some from other states.

Rogue Resources, the new sawmill in Steamboat Springs employs about a dozen people. Bonn Mill, in existence for about a decade in Steamboat also employs several people. Mountain Millworks, a wood finishing mill, employs two or three people.

People come to the forest year round for the vast recreational opportunities. Visitation has increased over the past 10 years. As population in metropolitan areas increase more people are willing to travel further for the quality of experience and solitude they seek from National Forest System Lands. People who come to the forest for recreation often stay in local communities, making numerous purchases and contributing to the economy.

The Routt National Forest employs about 70 permanent employees, and an additional 70 seasonal workers each year, some local and some from other areas. These employees live and work in the local communities contributing to local economies.

Community Interaction

MBNF

The Medicine Bow National Forest has an active partnership program that reaches across all disciplines to share expertise, education, funds and accomplishments. The Forest has a partnership strategy and action plan with a present focus on the watershed restoration and wildlife habitat associated with water resources.

Medicine Bow Forest Plan Cooperators group – this group was formed during the revision of the Medicine Bow Forest Plan. The group originally formed to collaboratively seek solutions to various resource issues as they were addressed in the Forest Plan. Since the completion of the revision the group meets regularly to discuss how the Forest Plan is being implemented.

University of Wyoming – Laramie is home to the University of Wyoming. Being in the same town as the University has provided wonderful opportunities to partner. Forest personnel are often asked to speak or serve on panels and provide expertise for classroom or symposium discussions/debates. University students often work seasonally for the Forest, and many choose mutually beneficial projects concerning forest resources (i.e., data collection, monitoring, data entry, GIS work, etc.).

Wyoming Conservation Districts – The Forest works with nine conservation districts, collaborating on common issues.

More Kids in the Woods program – "Live the Miracles of Nature" is an outdoor education program on the Medicine Bow National Forest, involving kids who might not otherwise have the opportunity to experience nature in a quiet, nearly-alone setting. The focus is to get kids to the forest and provide the time to explore, ask questions, and to learn and appreciate nature as part of the big community we all belong to. About 50 youths went on field trips into the forest in small groups and explored nature, off the beaten path. Under the guidance of Forest Service employees, they learned how to use compasses, maps and air photos to navigate through remote wilderness areas. There was ample time and attention to ask questions of their Forest Service "guides" who one student described as being "very kind and adventurous."

Travel Management - The Medicine Bow National Forest began the Travel Management Planning process and analysis in 2000. An Environmental Impact Statement with extensive public involvement was completed in 2000. This decision eliminated all off-road travel. Site specific analyses by districts occurred over the next few years resulting in a system of designated roads and trails for motorized use. This process was complete in 2007 with the Laramie Peak and Eastern Snowy Range travel management decision. All three districts on the Medicine Bow NF have completed their Motor Vehicle Use Maps and they are available to the public.

RNF
The Routt National Forest has an active partnership program that reaches across all disciplines to share expertise, education, funds and accomplishments. The Forest has a partnership strategy and action plan with a present focus on the watershed restoration and wildlife habitat associated with water resources.

Packard Foundation -- In 2009, the Packard Foundation chose the Yampa Valley to invest about $5 million dollars in habitat improvement for fish and wildlife over a 5-7 year period, with possible partnership work and funding to continue over the many years. Several other local partners will be brought on board during the next several years.

Northern Colorado Beetle Cooperative – the Routt National Forest was instrumental in the formation of the Cooperative. The Cooperative organization focused on the future future impacts to local economies and wildfire risk to communities and watersheds. Our charge is to initiate and guide actions that address these impacts and risks - future industry capability, future organizational capacity to deal with wildfire risk to communities and watersheds, and collective prioritization of cooperative projects that erase limiting boundaries.

Bark Beetle Information Task Force - local city and county government, state and federal agencies, the local chamber, and local non-profits joined forces to provide information and education about the huge bark beetle epidemics and the resulting effects on natural resources, the landscape, and tourism. Many projects have come from leveraging funds with all these entities – exhibits, brochures, interpretive signs, PSAs, events, etc.

Yampatika Interpretive Association – the FS partners with the association to provide interpretive opportunities across the forest, on the Steamboat Ski area, and in communities. The focus is natural and cultural interpretation. Projects include interpretive brochures, educational displays, walks, talks, children's programs, natural resource education for adults, and fund raisers that get needed work accomplished on the ground. These efforts contribute to tourism and community economic viability.

Routt County Wildland Fire Council (Education Committee) – an interagency educational group that promotes wildland fire prevention and mitigation.

North Park High School Greenhouse – continue to work in partnership with the school district to collect native seeds and raise them in the greenhouse to revegetate National Forest Lands and private lands with native plants.

Rocky Mountain Youth Corps and Steamboat Community Youth Corps – The FS works with this organization to get needed work done on the forest and to mentor youth into natural resource appreciation.

Natural Resource Interpretation – Numerous interpretive projects have been planned and implemented in partnership with local entities including Fish Creek Brochure, Teller City signs, ski area signs, signs across the forest about blowdown, beetles, and forest health, Red Elephant trail, local history and tourism signs and brochures and kiosks in Yampa and Hayden.

Yampa Valley Info – participated in their mission to gather and display valley-wide information to promote the spirit, culture and heritage of our communities. Linked the MBR website to Yampa Valley Info, which is one-stop website shopping for information about the Yampa Valley, especially for people desiring to recreate here or to relocate to Routt County.

Scientific and Technical Assistance

Collaboration

Medicine Bow Item Objective 3.a.1
Reporting Period: Five Year

This monitoring item asks the question:

How do we address problems with Forest land management, invasive species, animal damage, and noxious weeds in a collaborative way?

The Forest works closely with both State Departments of Agriculture regarding noxious weed management efforts. Cooperative agreements are in existence with 3 Colorado and 4 Wyoming counties to inventory and treat noxious weeds. Two contracts for weed control work are in effect on the Routt. Numerous partners contribute funding and/or time to assist in treatment efforts, including some grazing permittees.

A national MOU exists between the Forest Service and the U.S. Animal and Plant Health Inspection Service (APHIS) for animal damage management (ADM). APHIS—ADM has prepared regional or state environmental documents for all management efforts in both states. Each year, an annual ADM plan is prepared and coordinated between the Routt Districts and the Grand Junction ADM regional office and between the Medicine Bow Districts and the Casper ADM regional office.

A national MOU exists between the Public Lands Council (PLC) and the Forest Service (as well as the BLM) for cooperative rangeland monitoring with grazing permittees. The number of grazing permittees who are assisting in collection of allotment monitoring data is increasing each year. Cooperative Extension Service personnel from both land grant universities are actively involved in conducting training and working with producers. The Wyoming Stockgrowers Association and the Colorado Cattlemens Association have been instrumental in urging their members to be involved in allotment monitoring efforts and in training and coordination efforts with Forest Service permittees.

The Forest and the Laramie County and Laramie Rivers Conservation Districts have entered into an MOU to address range and water quality issues in the Crow Creek watershed on Pole Mountain.

Employees of the Wyoming Department of Agriculture (and to a lesser degree, the Colorado Department of Agriculture) have been heavily involved in on-the-ground coordinated management efforts, reviews of existing and desired conditions, and in helping to strengthen allotment management coordination for common objectives.

Partnerships

Medicine Bow Item Objective 3.a.2
Routt Monitoring Item 2-5
Reporting Period: Annual

These monitoring items ask the questions:

To what extent is public assistance and participation being utilized in implementing monitoring activities?

How are partnerships contributing to maintaining or enhancing recreation resource opportunities?

Monitoring Protocol/Data Collected

Partnership activities are tracked through a corporate database (I-Web). The amounts shown below include agreements both for the MBR portion of the Forest, but also the TBNG due to the three units being administered centrally.

Results/Evaluation

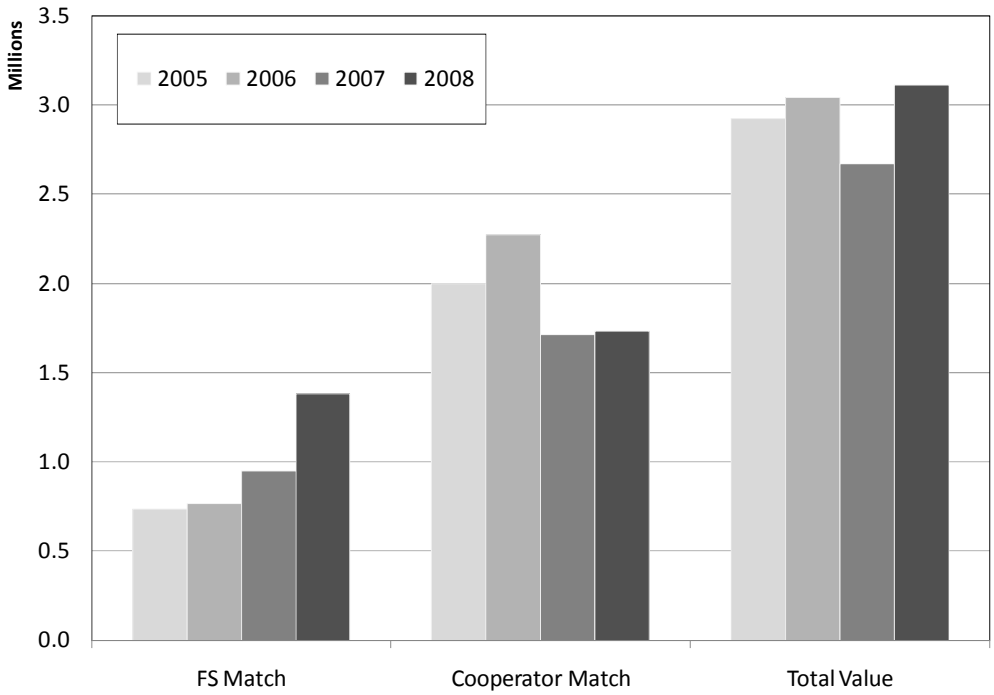


Figure 32. Value of Partnerships in FY05 -FY08.

Partnerships have greatly enhanced the Forests' ability to accomplish work. In FY08, a total of 90 agreements[8] resulted in over $3.1 million worth of work being accomplished on the Forests and Grassland, which is an increase over FY07 and previous years. Many different types of work are being accomplished.

[8] Includes new modifications of previously existing agreements.

Working with counties has helped the MBR to accomplish invasive weed treatment, fire and law enforcement activities. Agreements with WGFD, CDF and WYNDD increase our ability to inventory and monitor terrestrial and aquatic wildlife in addition to plants.

Utilizing the skills of the Rocky Mountain Youth Corps and of trail user groups such as Front Range Trailriders increases our ability to maintain and improve trails and recreation sites.

Agreements with the BLM, State of Wyoming and private landowners enable cooperative prescribed burning projects. Organizations such as the Owl Mountain Partnership have contributed to fencing and other rangeland management projects.

Partnerships and Recreation

Brush Creek/Hayden Ranger District
Partnerships play a vital role in recreation management on the District in 2008. The Wyoming YCC completed bark beetle mitigation, trail maintenance, and trail construction work. One eagle scout project was completed on a new portion of the Mainline Trail. The wooden fence at the Brush Creek VIS was stained by Boy Scout troop from Iowa. Finally, approximately 15 miles of trail were logged out by two local volunteers with assistance from their llama string.

Hahns Peak/Bears Ears Ranger District

- In wilderness – the Friends of Wilderness are instrumental in assisting in monitoring use, impacts (illegal activities), NVUM etc. They have approximately 45 members. In winter, smaller groups, such as Friends of the Routt Backcountry (8 people participating) assist in monitoring of the winter recreation decisions.
- Various partners offer time to help enhance recreation resource opportunities. Many groups offer support in the form of volunteer service days to work on specific projects. Examples include the Sierra Club, Smartwool Company, Backcountry Horsemen of America, and the Lowell Whiteman School. The Friends of Wilderness offer greater support throughout the summer, and Friends of the Routt Backcountry in winter. Yampatika offers guided tours and free interpretation programs on the Forest.
- Partnerships, through permitted outfitter guides, also offer education and interpretation to the public. This includes the Steamboat Ski Area, where there is a dedicated space where Yampatika, Steamboat Ski and Resort Corporation and the Forest Service share space to educate the public on the National forest.

Parks Ranger District
The Northern Colorado Trail Riders are a motorized trail club out of the Northern Front Range area that annually help the Parks District clear and maintain motorized trails on the district. Their help is invaluable in helping to keep trails clear and open.

The Continental Divide Trail Alliance (CDTA) has continued to be a partner in seeking out funds, and providing volunteers for construction of the Continental Divide National Scenic Trail. We are also working with the CDTA to investigate new trail corridors across the district to tie into the Rabbit Ears Pass area.

Recommendations

- Continue with all existing partnerships.

Interpretation and Watchable Wildlife

Medicine Bow Objective 3.a.3
Reporting Period: Annual

This monitoring item asks the questions:

To what extent have watchable wildlife activities been developed?

Does the Forest provide interpretive experiences that describe ecosystem functions and the Forest Service Mission?

Monitoring Protocol/Data Collected

Annually, document the number of watchable wildlife and plant sites, the development and interpretation activities at existing sites, naturewatch, interpretive programs and experiences that provide environmental interpretation and awareness.

Plants

Results/Evaluation

Watchable Plant Sites:

- MBNF Special Interest Areas (SIAs) with botanical emphasis: Ashenfelder, Cinnabar Park, Medicine Bow Peak, Kettle Ponds, Sunken Gardens, and Ribbon Forest. RNF SIAs with botanical emphasis: Camp Creek, Little Snake.
- Snowy Range Visitor Center (BCH).
- Vedauwoo Interpretive Area and Interpretive Handout (LRD).
- Pole Mountain Rest Area Interstate 80 (LRD).
- Centennial Visitor Center (LRD).
- Libby Flats Interpretive Area (LRD).
- Brooklyn Lake Interpretive Area (LRD).
- Big Creek Lakes Interpretive Trail (PRD).
- Highway 70 on Sierra Madres near Sandstone work center -- the Phoenix Forest
- Little Laramie River Trailhead on Snowy Range
- Green Rock Picnic Ground on Snowy Range
- Wyoming Wildlife (with discussion of Plant Communities) sign above Silver Lake on Snowy Range
- Three sites along the 261 road (near Red Hill) about lodgepole pine, aspen and spruce/fir

Watchable Plant Activities: No interpretive activities specific to plants were conducted in FY08. Many activities have occurred in past years and please refer to past monitoring reports for details.

The six botanical SIAs for the MBNF were identified in the MBNF LRMP and ROD, so FY04 was the first year that these sites were noted as available for watchable plant activities. The RNF SIAs were identified in the RNF LRMP and ROD and have been available for watchable plant activities since 1998. The six other sites noted have existed for some time and generally have moderate to heavy visitor use.

Figure 33. Columbine on the Continental Divide near Bridger Peak.

Action Taken on FY06/ 07 Recommendations

- A need to complete official documentation for 12 "Watchable Wildlife-Plant sites" was identified in FY04-FY06. Official documentation of these sites as "Watchable Wildlife-Plant sites" remains to be completed as of FY08.
- In FY05-FY06, coordination between front desk VIS, Engineering (sign locations) and Botany program personnel was identified as need in order to inform publics about where "Watchable Wildlife-Plant sites" occur on the MBNF. No actions were taken in FY08 to move forward on this recommendation.

Aquatic Life

Results/Evaluation

MBNF

Two Forest programs and one cooperative program introduce children and their parents to recreational fishing and principles of aquatic ecology. The Forest does not sponsor programs that are, per se, directed to watching aquatic biota.

Each year, the BCH district and the Laramie RD hold environmental education and recreational fishing programs. In addition, the aquatics program manager participates in an annual multi-agency recreational-fishing program called "Family Fishing Day". All of these programs integrate recreational fishing skills and environmental issues related to understanding and protecting aquatic ecosystems. Occasionally, north zone aquatics participate in second-party programs sponsored by groups such as Trout Unlimited and local civic groups.

RNF

South zone aquatics personnel typically participate in second-party environmental education and recreational fishing programs sponsored by groups such as Yampatika. These programs aim to integrate recreational fishing skills and environmental issues related to understanding and protecting aquatic ecosystems. South zone personnel participate in at least one environmental education/recreational fishing program each year.

Recommendations

Continue to sponsor and participate in interpretative, environmental education, and recreational fishing programs.

Terrestrial wildlife

Results/Evaluation

Currently, there are no developed facilities that are specifically designed to be a "watchable wildlife site" on either Forest.

Naturewatch Activities for 2008:

The BCH District completed 10 presentations or classroom exercises for 322 students and 80 adults in 2008.

The Douglas Ranger District wildlife personnel conducted multiple wildlife interpretation events.

Friend Park 5th Grade Environmental Education Day: A 1 day field trip with approximately 20 students, 3 parents, and 1 teacher went to Friend Creek and the nearby prescribed burn area to discuss riparian and beaver interactions as well as discussions associated with the historic Friend Park Burn. TES and other wildlife habitats and human interactions were discussed.

Laramie River Bat Night: A one night cross training and bat awareness program was held at the Rainbows End historical fishing camp on the North Laramie River. It was attended by 15 non-wildlife Forest Service Employees. The Anabat bat detection system and mist netting protocols were demonstrated, as well as an opportunity to see bats up close.

Douglas Middle School Bat Awareness program: Members of the district wildlife staff provided an all school bat education program. It was attended by approximately 390 students and 37 teachers.

International Migratory Bird Day: Wildlife personnel led a birding trip along the North Platte River. Twelve individuals participated in the experience.

Yampa Ranger District, in cooperation with District's Visitor Information Services personnel, developed and implemented regular spring school programs and field trips.

In 2008, the HPBE Ranger District wildlife personnel participated in the International Migratory Bird Day and hosted a Colorado Breeding Bird Atlas II training for the Yampa Valley Bird Club.

The Parks Ranger District wildlife personnel assisted with the organization of the Walden public schools 2008 Science Fair.

The terrestrial wildlife program on the MBR has in the past, and continues to contribute funding and personnel time towards many conservation education and environmental awareness activities. The following is a generalized list of the kinds of activities supported by this program over the past several years:

- Participation in the annual International Migratory Bird Day festivities to celebrate the gift of birds.
- Organizing and conducting field trips on the forests for school children and others to increase the awareness, appreciation and understanding of ecosystems and all their ingredients.
- Providing many wildlife-related presentations and classroom exercises for countless students and adults of all ages to illustrate the many interactions among wildlife species, their habitats, and the complications of human involvement.
- Facilitating programs focused upon special sets of species, such as bat awareness.
- Contributing funding towards nature displays, conservation education brochures, environmental education activity sets, and Visitor Information Services personnel time.

Recently, Laramie Ranger District wildlife personnel initiated the "Live the Miracles of Nature" experience for youth enrolled in community social service programs that typically don't have the opportunity to visit the National Forest. This experience provides these youth the opportunity to experience wild areas in a quiet, nearly alone setting, where the emphasis is on discovery, learning and introspection. The District wildlife biologist was given the Rocky Mountain Regional Forester's Honor Award for this project.

Interpretation

- The Parks District does a few interpretive programs each year primarily addressing outdoor ethics through Tread Lightly or Leave No Trace educational programs. In 2008 programs were also delivered on soil and water conservation and forest health (bark beetles).

Recommendations

Complete the first phase of the California Park wildlife interpretive sign installation on the HPBE Ranger District. Expand the "Live the Miracles of Nature" program to other districts on the MBR. Continue to promote and support conservation education and environmental awareness activities on both Forests and within local communities.

Knowledge Base

Medicine Bow Objective 3.b.1
Reporting Period: Annual

This monitoring item asks the question:

How can we build technical knowledge bases across all land ownerships?

Plants

Monitoring Protocol/Data Collected

Rare plant inventories following generally accepted protocols (Nelson 1985, Bonham et al. 2001) but not always fully compliant with recent NRIS TES database protocols (http://www.fs.fed.us/emc/nris/) has been completed across project areas for between 2/3 and ¾ of the Medicine Bow NF (Roche 2004-2008, Proctor 2004-2008). The MBNF cooperates with the WYNDD to record data on rare plants in Wyoming. WYNDD has data collection protocols at its website (http://uwadmnweb.uwyo.edu/WYNDD/). The RTNF cooperates with CNHP to record data on rare plants in Colorado. CNHP has data collection protocols at its website (http://www.cnhp.colostate.edu/).

Floristic inventory (complete list of vascular plants) has been completed for all of the MBR (Burke 2000, Hartman and Nelson 2000, 2002a,b,c, Kastning 1990, Regan et al. 1998).

The MBNF completed an inventory of old growth and has incorporated this inventory into the GIS and project planning. The protocol for the old growth inventory was developed by the forest and is available at the Forest Supervisor's Office in Laramie. The old growth inventory was compliant with direction for ecological inventories in FSM 2060.

The Forest ecologist has worked with around 50 researchers to implement research projects on the MBR since 2004. Few of these projects have been completed and published however, requirements are included in permits to provide published research or other research summaries. The ecologist keeps a reasonably up-to-date copy of past research publications available for forest use. These are kept at the SO in Laramie. A completed project on disease in Alder was recently published (Worral 2009). WYNDD has completed publication of fen inventories (Heidel and Larson 2003). Publications from research that was started before the LRMP revision has been received and is on file at the SO. Ongoing research includes studies on treeline and climate change, bark beetle effects, rare plant distribution and reproduction and wildlife habitat.

Results/Evaluation

Although data has been collected, not all of it resides in corporate databases. Efforts have been made to begin input of data into databases. The NRIS TES Database for rare plants has only been available in the last 3 years.

The MOU with the UW was updated during 2007. This effort lead to a joint conference scheduled for 2009 in which research completed on the MBRTB will be presented.

The RMRS published the results of several inventories and analysis on the MBNF (Pop and Lundquist 2006, Dillon et al. 2005).

The forest botanist developed a Native Seed Program that involved cost share with several partners.

Recommendations

MBR needs to identify database input as a priority and provide funding. The MBR should continue to allow research activities where they are appropriate. A coordinated approach to research permits could reduce the amount of time the forest spends on permitting research activities while also improving communications with potential researchers.

Visual Resources

Inventory and monitoring protocols for visual resources is guided by the NFS handbook: Landscape Aesthetics: A Handbook for Scenery Management which is in the National Forest Landscape Management Volume 2, Chapter 1.

There is an inventoried Scenery Management System map for the Medicine Bow NF, and a inventoried Visual Management System map for the Routt NF. The data is stored in the forest GIS database.

Recommendations:

Update maps to include new scenic/recreation areas and roads and trails that are getting more use and that provide high and moderate interest in scenery. This would require a forest plan amendment.

Effective Public Service

Road System

Medicine Bow Objective 4.a.1, 2, 3, 7
Reporting Period: Annual

This monitoring items ask the questions:

Does the road system meet public safety and management needs for passenger vehicles while protecting resources?

Does the road system meet public safety and management needs for high clearance vehicles while protecting resources?

Does the road system meet public safety needs?

Results/Evaluation

Road Maintenance
On the Medicine Bow and Routt National Forests, 738 miles of roads suitable for passenger cars received maintenance in FY2008. Approximately 204 miles (17 percent) of the 1200 miles suitable for passenger cars are considered to be maintained to standard. Road improvement projects were conducted on 5.4 miles of road to help reduce deferred maintenance needs.

On the Medicine Bow and Routt National Forest, 155 miles of high clearance roads received maintenance in FY08. The normal maintenance cycle of these roads is every 5 years. Approximately 2010 miles (64%) of the 3140 miles of high clearance vehicle roads are considered to be maintained to standards, even though all those miles do not receive maintenance on an annual basis.

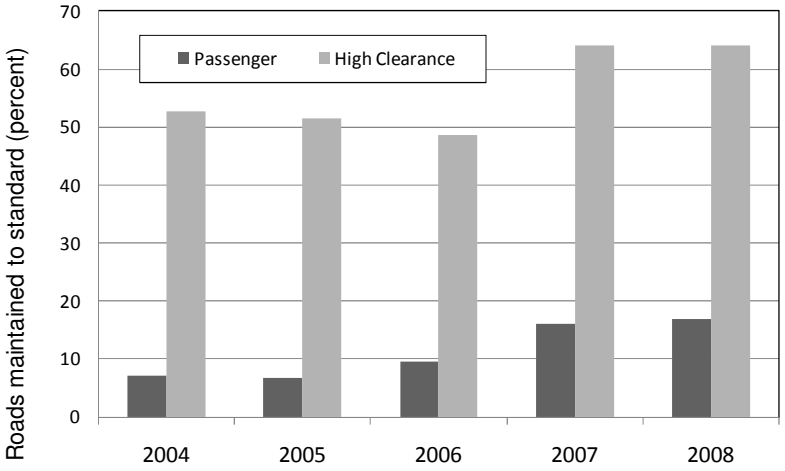


Figure 34 Roads maintained to standard 2004-2008.

Over the past 5 years, the miles of roads maintained to standards gradually increased (see Figure 34).

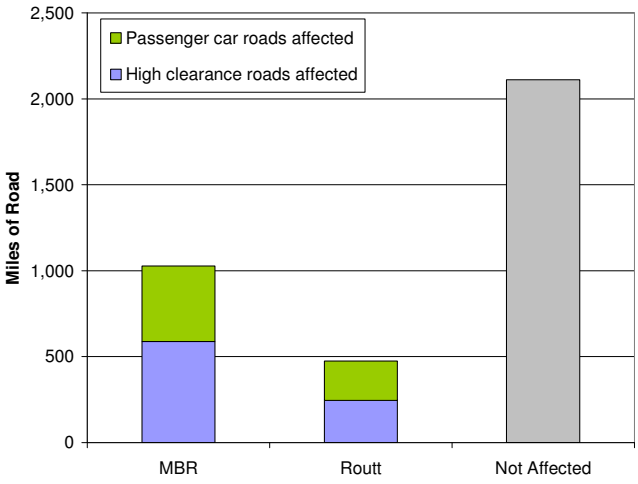
MPB Epidemic and Road Safety

The National Forest Transportation System consists of roads and trails that are on, or provide access to, National Forest System lands (36 CFR 212.2). Forest Service Manuals, Handbooks and the Highway Safety Act of 1966 state that the Forest Service has a responsibility to maintain the safety of its roads and trails.

There are a total of 4,516 miles of level 2, 3, 4, and 5 roads across the MBR. Of these 4,516 miles, 2,404 miles, (53 percent) are within lodgepole stands that have been, or are expected to be affected by MPB epidemic and could impact a single road or potentially an entire system of roads.

An additional spatial analysis was performed with the maintenance level of roads suitable for high clearance or passenger cars (Level 2-5 roads) layers to determine which sections of roads might be within 150 feet of the appropriate Lodgepole vegetation. Figure 35 displays the miles or total segments of roads by maintenance level on each Forest that could be impacted by potential treatment of hazards trees. The treatment or disturbance could impact the road and affect maintenance costs. Additionally, unauthorized routes around blocked roads may increase resource damage.

Conclusions



Effects on Access: Roads and trails considered hazardous will be closed; this could impact single roads or entire road systems.

Health and Safety: Dead and dying trees could potentially pose a hazard by striking persons or property. In addition, fallen trees could block roadways, thus preventing both emergency and non-emergency ingress and egress. A reduction of open access routes to National Forest System lands could increase use on remaining system roads/trails, possibly increasing safety concerns along those routes.

Figure 35. Roads by maintenance class affected the MPB epidemic.

Road Management: Damage to the road system is expected as a result of increased water flow resulting from tree mortality. Existing drainage structures may not be adequate for expected increase in water flows due to tree mortality. Over time, fallen trees could cause culvert blockages resulting in culvert failures. Plugged and failed culverts would likely cause increased sedimentation to the stream network. Additional drainage structures will likely be needed to accommodate the expected increase in water flows. Each road will need on-site evaluation to determine the need for additional rolling dips, additional ditch relief culverts, plating to reinforce existing drainage features, or improved creek crossing structures (culverts, arch culverts or low water crossings). Failures of road cut slopes and fill slopes will become more prevalent as a result of increased water flow resulting from tree mortality.

Road closure devices, such as gates could be damaged due to falling trees. Without effective road closures, the desired travel management strategy could become less effective. Unauthorized routes will likely be created around stretches of roads and trails that are blocked by fallen trees which could lead to increase road damage and soil erosion.

Road Maintenance: Increased road maintenance needs can be expected due to expected increase in water yield and peak flows. Annual and deferred maintenance costs will increase. Hazard tree removal costs would increase. Culverts are at risk of failure due to the aged condition of the existing pipes along with the expected increases in water flow. Rutting and erosion will increase as road subgrades become more saturated.

Recommendations

- Implement Forest-wide Hazard Tree Removal and Fuels Reduction Project.
- Evaluate each road for additional drainage needs
- Replace vulnerable stream crossing structures (culverts, bridges, etc)
- Identify and decommission roads no longer needed to reduce long term road maintenance costs.
- Consider evaluating signage needs for project work to meet “Manual of Uniform Traffic Control Devices” requirements.

- Consider developing a pool of certified traffic control flaggers.
- Incorporate implementation time and costs into program of work.
- Develop list of equipment operators in local communities available for emergency work.

Roads – Road Decommissioning

Medicine Bow Objective 4.a.3 & 4
Reporting Period: Annual

This monitoring item asks the question:

To what extent have roads that have been identified as unneeded by a roads analysis been decommissioned?

Results/Evaluation

On the Medicine Bow National Forest, 142 miles of unauthorized roads were decommissioned in FY08. The Routt Forest decommissioned 0.8 miles of system road. Decommissioning was accomplished with forest road funds.

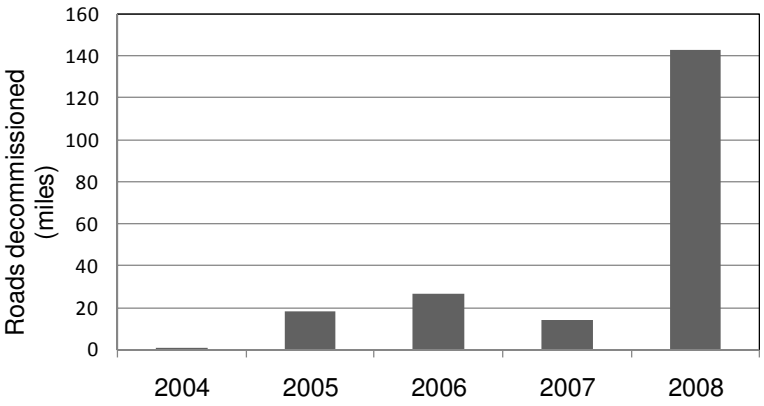


Figure 36. Miles of roads decommissioned 2004-2008.

Road decommissioning increased dramatically in 2008 as a result of the Eastern Snowy Range Travel Management decision that included over 200 miles of road decommissioning. Partner funding was obtained to implement this project. More detail can be found under the *Water Quality* Monitoring Item.

Facilities – Safety and Security

Medicine Bow Objective 4.a.5, 6
Reporting Period: Annual

These monitoring items ask the questions:

Do the existing facilities with the potential for reconstruction provide for safety and security of the public and employees?

To what extent are the existing buildings, bridges and other facilities maintained to standard?

Results/Evaluation

Major construction and reconstruction projects are funded through the Regional Capital Improvements Program (CIP). The CIP funding is limited and must cover projects throughout the Rocky Mountain Region.

Construction was completed in FY08 on the following CIP projects:

- Esterbrook Work Center Consolidated Storage (done but not closed out) , Douglas RD
- Saratoga Work Center Consolidated Storage, Brush Creek/Hayden RD

The following CIP project was awarded late in FY08 and is anticipated to be completed by early FY09:

- Saratoga Shop/Garage, Brush Creek/Hayden RD

Several historic renovation tasks were completed in FY08 by the National Park Service on the Brush Creek Work Center (Brush Creek/Hayden RD). Additional construction projects remaining will be completed through contracts in FY09.

Planning and accomplishment activities are compiled and reported in the INFRA database, an NFS corporate database. For buildings, annual accomplishment reports can be generated listing total deferred maintenance and the end of year facility condition index ratings. Maintained to standard requires a condition survey be accomplished no less than every 5 years and the facility condition index be good or fair. In FY08, the Forest building inventory included 370 recreational and administrative buildings, 49% of those were maintained to good or fair condition and approximately 79% received the required facility condition survey. Dams, water systems, and waste water systems were in a similar condition.

Declining budgets require the Forest to assess and prioritize facility needs and then focus limited funds on our highest priorities. At the end of FY08, the backlog of deferred maintenance on all facility classes, including buildings, bridges, dams, drinking water systems and wastewater systems was nearly $7.2 million. In order to balance the constrained budget and deferred maintenance backlog, the Forest is aggressively pursuing a facility disposal program. Progress is slow but small steps are made each year.

In FY08, two Forest facilities were disposed of by demolition. Additionally, all forest real property records in the NFS corporate database, I-Web, were reviewed and validated this year per the Federal Real Property Profile reporting requirements.

Implementation Monitoring

Endangered Species Act

Medicine Bow Item Subgoal 1.b
Reporting Period: Annual

This monitoring item asks the question:

Are actions identified in national recovery plans for threatened and endangered species being implemented where opportunities exist on the Forest?

Monitoring Protocol/Data Collected

This requires a review of the opportunities to implement national recovery plans, and a description of any actions taken in support of a National Recovery Plan.

Results/Evaluation

The bald eagle (*Haliaeetus leucocephalus*) has been the only ESA-listed species on the Medicine Bow and Routt National Forests with a recovery plan. It was removed from the federal list of threatened and endangered species in August of 2007. The Preble's meadow jumping mouse (*Zapus hudsonius preblei*) is federally listed as a threatened species. In 2008, that portion of its range within the state of Wyoming was removed from the federal list. Within the Medicine Bow-Routt National Forests, this mouse was only known to occur on the Medicine Bow (in Wyoming). The bald eagle and the Wyoming segment of Preble's meadow jumping mouse have now moved onto the Region 2 sensitive species list, at least for the duration of the 5-year post delisting monitoring period.

Currently, the Canada lynx (*Lynx canadensis*) is the only federally listed species on the MBR. A national recovery plan for this species is yet to be completed. Neither the Medicine Bow nor Routt is identified as critical habitat for the species. The Southern Rockies Lynx Amendment (SRLA) was signed in 2008. This decision amended eight Land and Resource Management Plans in the Rocky Mountain Region, including the Medicine Bow and Routt Plans. It provides overall management direction for this species on National Forest lands within these eight Forests. This management direction is currently in effect for both Forests.

Recommendations

Continue to implement the SRLA on the MBR. Identify potential future actions in support of recovery for lynx. Continue monitoring bald eagle nest and roost sites and Preble's meadow jumping mouse as funds allow.

Continue to monitor this item annually over the life of the plan.

Plants

Prior to 2007, there were no Threatened or Endangered plant species documented on the Medicine Bow or Routt NFs and no identified habitat.

New information on Ute ladies tresses (ULT), a threatened plant species (Fertig et al. 2005) has identified that habitat for this plant reaches up to 7,000 feet in elevation. There is a draft recovery plan for ULT (USFWS 1995), however there is not any critical habitat identified for ULT.

The USFWS has indicated that the MBNF may have habitat or presence of blowout penstemon (*Penstemon haydenii*), listed as an endangered species, for the first time in 2008. Blowout penstemon is associated with sand dunes and blowouts below 8,000 feet in elevation. There were no projects which included habitat for habitat for blowout penstemon in 2008.

The effects of water depletions in the Platte River Basin have been identified to affect one threatened plant (western prairie fringed orchid) that occurs downstream in the Platte River in Nebraska (Kelly 2007). A biological assessment was prepared for this plant species in

association with the re-issuance of permits for the Recreation Residences on both the Medicine Bow and Routt NFs (Roche 2007d,e). The biological determination for this project was "Likely to Adversely Affect". Implementation of the recovery plan for Platte River T&E species issued in 2006 (USFWS 2006) began in 2007 (Parker 2007). Although consultation with FWS occurred prior to the release of the recovery plan, all actions were in compliance with the recovery plan. Consultation for one project was completed for the western prairie fringed orchid.

Conclusion

All actions were in compliance with the recovery plan for the Platte River T&E Species (USFWS 2006). There were not any actions that were not in compliance with the draft recovery plan for ULT.

Recommendations

Continue to monitor this item annually over the life of the plan.

Implementation of Standards and Guidelines

Legally Required 36 CFR 219.12 (k)
Routt Monitoring Item 2
Frequency of Measurement: Annual
Reporting Period: Annual

These monitoring items ask the questions:

Are the standards and guidelines prescribed in the plan being incorporated in NEPA documents and implemented on the ground?

Have site-specific decisions successfully implemented the Forest Plan's Direction?

Monitoring Protocol/Data Collected

The MBR have evaluated how projects have implemented the forest plan with three different methods:

- Forestwide IDT monitoring field trips
- District IDT monitoring (initiated in FY06)
- BMP monitoring, led by the forest watershed personnel

Over the past 5 years, the forests have evaluated 65 projects throughout the forest. Table 69 below gives the number and types of projects monitored. The initiation of district IDT field trips and of NFIM funding for BMP monitoring has resulted in significantly more projects being evaluated each years since FY06.

The types of projects being monitored has varied with the year due to what projects are occurring on the forest. While the Medicine Bow Forest Plan suggests monitoring a minimum of three timber sales, on range and one other project on the forest each year, other projects, such as prescribed burns and fuels treatments have been evaluated as more of these projects were being implemented during these year.

In response to the MPB epidemic, more fuels reduction projects, and hazardous tree removal projects in campgrounds were evaluated. Additionally, as travel management decisions

started to be implemented in FY07, road decommissioning and motorized trails projects were evaluated in the past several years.

Table 69. Number and types of projects evaluated from FY04 - FY08.

Project Type	FY04	FY05	FY06	FY07	FY08	Total
Timber	4	2	1	6	2	**15**
Range		2	2	1	1	**6**
Roads/Trails	3	1			7	**11**
Lands/Special Uses			2		2	**4**
Prescribed Burn / Fuels Reduction		1	4	6	2	**13**
Watershed Improvement*		2	1	2	3	**8**
Recreation			1	1	8	**10**
Total	**7**	**8**	**11**	**16**	**25**	**67**

* Includes road decommissioning projects

Common Themes from FY04-FY08 Field Monitoring:

- Involve appropriate specialists throughout planning and implementation. Interdisciplinary team involvement should continue beyond the planning phase and throughout implementation in order to have the projects meet project objectives and forest plan standards and guidelines. Additionally, sale administrators, burn boss, and other personnel responsible for implementation should be involved in planning.
- BMPs appear to be effective when implemented correctly. Correct implementation depends upon not just including the BMPs in the permit/contract/logging plan, etc; but also on oversight and monitoring during project implementation.
- The forest has been using partnerships effectively to accomplish recreation projects and wildlife and watershed improvement projects.
- Stewardship projects can successfully meet the project objectives; however administration workload may be higher than with other projects. Projects should incorporate design criteria necessary to meet forest plan standards and guidelines, similar to other projects.
- Generally, silvicultural prescriptions and logging techniques have resulted in units retaining the appropriate amount of snags and coarse woody debris. With the MPB epidemic, the issue has shifted from ensuring enough coarse woody debris remains to ensuring that the slash is not piled too deep to inhibit regeneration.
- In range allotments, riparian areas tend to be more utilized than upland areas. Stubble height alone is not necessarily an adequate tool to measure riparian impacts.
- A variety of road closure techniques have been used successfully to close roads, unauthorized routes and dispersed sites. The closure type should fit the surrounding area and be appropriate for the scenic values of the area.
- Seemingly small special use projects, such as power line maintenance can have a large impact and may need a higher level of involvement from the lands/special use administrator and IDT team during project implementation.

FY08 Field Monitoring
The Forest Interdisciplinary Monitoring Team (IDT) visited several sites on the Medicine Bow-Routt NFs during the 2007 monitoring field trip. This trip stopped at the Strain Creek Stewardship, Lake Owen rails to trails project, and Eastern Snowy Range Road Decommissioning on the Medicine Bow NF. Hans Peak Lake and Hinman Park Campgrounds hazard tree projects were reviewed, in addition to the Mountain Parks Electric power pole replacement project on the Routt NF.

July 9, Stop 1 Strain Creek Stewardship

Objectives of the Project:
This project includes removing forest products (primarily post and poles and commercial thinning) which then is compensated through completing service work such as roadside brushing and pre-commercial thinning, removing spruce from aspen stands and closing user created roads.

The EA was signed in 1997, under the old Medicine Bow Forest Plan; a consistency check was done to ensure compliance with the 2003 Revised Forest Plan. In 2004, the district tried to sell it as a timber sale, but it did not sell. So they offered it as a stewardship project and the Laramie Rivers Conservation District was awarded the project. The Conservation District subcontracted the work to a post and pole operator. This project is scheduled to be completed in 2010. The district is working on how to pay for roadside clearing and aspen enhancement – i.e. reducing conifer encroachment in Aspen. The value of timber products are down so not all of the service work can be completed.

When this project was designed, the idea was to thin out the pole size trees to increase growth in the larger trees. However with the Mountain Pine Beetle, the larger trees will likely be hit by the beetle and are predicted to have high mortality.

IDT Team Evaluation

Resource Area	Evaluation
Engineering	Good cooperation between timber, fuels and engineering to accomplish roadside clearing.
Public Service and Infrastructure	Collaboration is good. Need to revisit old sales overall. Aspen enhancement looks good.
Scenery	Aspen is good for scenery and is good to increase in this area to compensate for beetle kill forest.
Aquatics	Looks good, Aspen enhancement close to riparian areas is beneficial.
Water Recourses	Good project, no adverse effects to water resources.
Recreation	Closing user created roads is a plus for the recreation program.
Timber	Using timber work to accomplish service work is good. Would be tough to sell to industry, who did not want this sale. Laramie district did a great job pulling this together – stewardship projects have a lot of potential.
Wildlife	Impressed by the mix of project activities. Should consider tweaking aspen enhancement projects to maintain a mixed aspen /conifer component for snowshoe hare habitat – which benefits lynx. Also consider retaining and girdling some large LPP in aspen stands to retain hard snags.
Renewable Resources	Project looks good. The amount of fuels left on site looks acceptable. Having post and pole products as a part of stewardship projects is good. Concern over the future of stewardship projects with the cost of timber products decreasing. Should have more discussion about aspen and conifers.
Regional Office	Consistency check with the new forest plan was good. Project is looking good.

Planning	
Laramie District	Agree with all the comments. Many things to consider for outyear projects.
Deputy Forest Sup.	How to take this type of project to a bigger level?

Summary

This project is well done with a good mix of projects and the stewardship aspect worked well. This project was well documented and the contract had all the standard provisions. Collaboration is key with working closely with the groups involved. Credit goes to the district folks who accomplished this.

Recommendations:

Overall this was a good project. For future projects, re-evaluate aspen enhancement and timber sale projects in light of the MPB epidemic and the prediction of the composition of the future forest will look like.

July 9, Stop 2 Lake Owen –Rails to Trails, Boardwalk and Fishing Pier Projects.

Objectives of the Project:

This project started in 2003. The railroad was built in the early 1900's and operated until 1996. The rails were removed in 1999. Albany County completed a feasibility study to convert the railroad bed to non-motorized trail. Scoping for this project was completed in 2007. The purpose and need was tied to the Forest Plan objective in this Geographic Area. The district partnered with a local bicycle group and WYDOT for a regional study. The significant issue was impacts to private landowners along the trail. A court case over this issue received a ruling favorable to the MBR.

The trail is 23 miles long with 6 trailheads. Trailheads are fee sites. The first layer of gravel applied had some problems on one section and that gravel has been replaced. An accessible fishing pier was also part of the project and has been built on Lake Owen near the trailhead.

Site plans for the trailhead were completed but not for all of the Lake Owen area. There were concerns over the roof on the pier due to visuals from the campground. The roof is important for accessibility. The boardwalk was installed in the wetland with helical concrete pillars screwed into the ground – which was a low impact method of construction.

IDT Team Evaluation

Resource Area	Evaluation
Engineering	Engineering concerns on how facilities were built. We should make sure we are incorporating design and safety factors from the beginning, which would have saved time and money. Having site plans prior to construction help facilitate good feedback.
Public Service and Infrastructure	Should finish what we started – complete site plans up front. Also should include vegetation management in campgrounds as part of the plan. Need to complete vegetation management plans for our campgrounds.
Scenery	Accessibility - The transition from the gravel path to the boardwalk needs a ramp for wheeled access. The fishing pier is also not accessible for the same reason. Wheelchair parking signs should be installed. Long term maintenance of boardwalk should be considered. The boardwalk could have been 4' wide instead of 8' to reduce long term maintenance costs. The width was to improve safety for bicyclists.
Aquatics	Access is good and spreads the fishing access around the lake. Pier with

	the shade cover is great and the boardwalk has good information on woodfrogs. A great facility for kids.
Planning	Project consistent with the Forest Plan and with the Nepa document.
Deputy Forest Sup.	Beautiful facilities. Good partnerships to accomplish project. Good to both reconstruct old facility and construct new. Maintenance will be a challenge given declining budgets.
Water Recourses	The district did get a 404 permit for this work and used less impactive helical piers for the boardwalk. The well has a water right. No stormwater discharge permit was completed ahead of time, but was completed midway through construction.
Recreation	Good project with lots of local comments and support. The past campground concessioner raised prices and the community had a strong reaction. There is the hope that the fees will help offset maintenance costs.
Timber	Nice facility, future maintenance could be expensive.
Wildlife	Project looks good.
Renewable Resources	Good project – district did a good job. The fishing pier should have followed engineering specifications.
Regional Office Planning	Great facilities with a well conceived approach. NEPA covered the fishing pier and trail. Recommend site plan for the entire area and a plan to manage dispersed camping nearby. It is hard for this forest to compete with higher recreation forests on the front range for funding. Would be good to get the RO recreation folks up here as this site would complete well with other forests. Is the forest getting recreation from people from Colorado?
Laramie District	Credit goes to the past district ranger. Appreciate that the accessibility coordinator identified the accessibility issues that need to be addressed.

Summary

This is a great project with good partnerships, and a good emphasis on interpretation. Boardwalk and fishing pier need some more work to become fully assessable. In the future, involve engineers and landscape architect early in the project, and have approved site and building plans prior to implementation.

Deferred maintenance needs to be reduced by 90% by 2020, so existing facilities need to be brought up to standard.

July 9, Stop 3 Eastern Snowy Range Road Decommissioning.

The Eastern Snowy Range Travel Management decision, (June, 2007) closes 292 miles of roads, in addition to creating new single track and ATV trails from existing roads and sections of new trail construction. In the past, the forest averaged 19 miles of road decommissioning per year. This project, scheduled to be completed by 2010, decommissions approximately 100 miles per year for 2009-2010. The road crew is implementing the closures this year, as the process to put together a contract has not yet completed, despite having been ongoing for the past year. The project lead applied for and received three grants – Wyoming Wildlife Trust Fund, Rocky Mountain Elk Foundation and a Clean Water Act from the State of Wyoming DEQ in addition to legacy road funding. Partners include trout unlimited, Conservation Districts, and WYCC .

Treatments are specific to each road, and some roads are well vegetated and have not needed need any treatment aside from a no motorized use sign. Others roads are ripped, water barred and fill removed at stream crossings. The beginnings of most roads are closed with a series of small berms and dead trees pushed over to make the road impassible.

The group looked at two roads closed last summer (2007). On one road, a dispersed camping area was left at the start of the road. Both roads were closed with small berms. The roads were ripped to encourage deep rooted vegetation on the roadbed. Roads are signed closed as well. Trees were pushed over at the beginning of the road to stop traffic.

Effectiveness of closures is being monitored. On one road, ATVs had gone around the closure, necessitating more berms to be installed, and more trees pushed over. Enforcement will be needed to maintain the closures. The MVUM maps should help with enforcement of the road closures.

The project is following the forest revegetation guidelines and only seeding where necessary. Typically in forested areas, the approaches to streams are seeded to reduce erosion and the beginning of roads are seeded to speed up the revegetation within sight distance from the open road.

In sagebrush, all of the disturbed area is seeded, especially if cheatgrass is present.

The group evaluated another road closed in 2007 off of HWY 230, which is a high scenic concern travel area. The small berms on the road do not blend in well. Ripping and seeding would be a better choice, along with removing the gate in the fence along the highway to prevent access. A tree spade could have been used to put in a few trees. On arterial and collector roads, visual concerns should be addressed. It is thought that the berms will settle down in a few years which would reduce the unnatural appearance. Dropping trees would also help although the road along 230 did not have any trees nearby to drop onto the road. Seeding would also help speed revegetation and improve visuals more quickly.

The group evaluated a stream crossing which will be treated in 2009. Permits (404, turbidity and stormwater) have all been obtained for this project. The plan for stream crossings is to remove the entire fill and apply erosion cloth and other erosion control as needed.

Roads in open areas are difficult to close – signs, small berms and enforcement for the first few years are necessary.

This project has completed most of the things stated in the project design and mitigation, such as permits, surveys and monitoring. Items still to be done are: increased education and interpretation at trailheads, and building the single track and ATV trails.

Monitoring is ongoing with monitoring all road closures completed in 2008 in 2009.

IDT Team Evaluation

Resource Area	Evaluation
Engineering	Great that this being implemented with a variety of treatments. The decision does include new motorized trails and the state of Wyoming can help with that portion of the decision.
Public Service	The adaptive approach to the type of treatments used is great.

and Infrastructure	
Planning	Nice to see this implemented.
Scenery	Good to have the discussion about visuals and to work on mitigating the scenery concerns.
Aquatics	This is a demonstration that the work can get done and done right. Beneficial too many resources. Closures should be done right the first time (as demonstrated) and there needs to be a commitment for enforcement. It would be good to create the new ATV trails to provide that opportunity for the public. This is a great benefit for fish and amphibians, even if we do not achieve 100% effectiveness.
Water Recourses	Should institutionalize the road closures and manage unauthorized uses.
Recreation	Difficult to make some road closures effective. Should reschedule the trip next year to monitor effectiveness.
Timber	Good project, impressed with the partners. May be able to get seedlings if groups want to plant sections of roads.
Wildlife	This is much more road decommissioning than has been accomplished in the past. This is important for wildlife and if we can demonstrate that the closures are effective, we should be able to get more funding in the future.
Renewable Resources	Great project with many partners and benefits. Large investment and there is a need for enforcement to have the road closures effective.
Regional Office Planning	Agree with everything. We should share this across the region to other forests. Have to protect our investment in these closures – one unauthorized trip through can ruin the closure. Monitoring is essential to ensure effectiveness and to feed information back to management.
Laramie District Ranger	Hoping for not too much public outcry against the project. Hope we can protect the investment.
Deputy Forest Sup.	This is an unusual project with the large amount of partnership funds. Lots of different techniques are being applied. Applaud the Project Leader's ambition in obtaining funding and implementing this project.

Summary

Good project with great partnerships. Enforcement and education are important, as is doing it right the first time. The results of what works for effectiveness should be shared with other forests. There is concern over the effectiveness of the closures and visual concerns should be mitigated.

July 10, Stop 1 Hahns Peak Lake.

Hahns Peak Lake has a picnic area and campground. The campground redesign is out for bid and not yet awarded as of the field trip date. This is a very popular campground with 80 to 90% use during the week, and full on weekends. Last fall, the district looked at what was needed to be done to treat the hazard trees in light of the beetle infestation. 275 trees were sprayed in 2007, however there still was tree mortality. The district wanted to remove the hazard trees prior to the campground renovation. A service contract was used to fell and deck the trees. The decked trees were included in the nearby Prospector Timber Sale. The funding came from multiple resource areas. There was good internal cooperation and much flexibility when trying to determine how to develop the contract.

Public involvement – most of the public want to have water at the campground, which will be a well included in the renovation. The project is expected to take two years to complete, and includes an assessable trail.

IDT Team Evaluation

Resource Area	Evaluation
Engineering	May lose some of our investment in the campground from the skidding – should consider this when designing future projects.
Public Service and Infrastructure	Vegetation management plans are important. This campground is a work in progress and illustrates what tools we have available to accomplish work.
Planning	Much discussion about the vegetation management plans. Should be consistent on how to develop them for our campgrounds. Current condition may not meet scenery standards.
Scenery	Some of the stumps are high, but some of them will be removed in the campground renovation project. Trees are still being sprayed. Would be good to plant trees for the future. Possibly should just stop spraying, remove all the big trees and then plant trees on the site.
Aquatics	This project meets forest standards. The trail will increase fishing opportunities.
Recreation	May need to have a longer campground closure than expected. Good collaboration between resource areas. The district collected seed for trees being grown by the NFS tree nursery for this site. The Vegetation Management Plan will be developed and this should help decide what additional trees should be removed. There are dead trees along the road into the campground that should be evaluated for removal. The forest has at least 12 more large campgrounds with this same hazard tree situation.
Timber	Good to see the project getting accomplished. Should complete the vegetation management plan for this campground. It would be good to try to eliminate the mistletoe in the campground, which should be considered in the vegetation management plan.
Wildlife	This project is consistent with Forest Plan Standards. This is a good site for watchable wildlife interpretation with a nearby osprey nest and a trail near the lake.
Renewable Resources	Applaud the district in completing this project. Would be good to share the lessons learned and communicate to the RO. This project has a high cost per acres which will be reflected in the amount of target met. This project will apply towards the fuels targets.
Heritage Resources	This project is consistent with cultural resources.
Regional Office Planning	Good to have the courage to treat the campground. After reconstruction should be a great facility. The visuals have been changed dramatically, but will still be a beautiful site. Forest should share lessons learned from this contract with the region.
HPBE District Ranger	There was good cooperation on the forest to solve this situation. Thanks to everyone involved.
Deputy Forest Sup.	It is sad that this is happening to the campgrounds. Would be good to have public education / interpretation about the beetle mortality. The campground renovation should have a good result. This is a lesson learned for future campground hazard tree removal projects.

Summary.
This was a good project with great cooperation at the forest level. This campground meets the visual quality objective of Modification, but maintains the desired landscape character due to existing mixed conifer trees that remain on the site. The forest should continue to work on maintaining and enhancing the landscape aesthetics of campground for present and future campers.

Recommendations
Take the lessons learned to the RO and to develop more tools for service contracts and to improve cost effectiveness.

Vegetation management plans should be developed across the forest and should be done consistently. They should incorporate adaptive management and be simple and efficient to complete.

July 10, Stop 2 Hinman Park Campground.

This campground was hit hard by mountain pine beetles. The district sprayed, but most trees still did not survive. The Barley Timber Sale is adjacent to the campground and the district contacted the loggers about removing trees in the campground. There were concerns over the safety hazard of nails in the trees, which is common in campgrounds. To mitigate the hazard, the NFS flagged the nails. The district included the campground in the timber sale to be winter logged and whole tree yarded. Branches did break off the dead trees however, leaving slash in the campground. It did not cost much to get this project accomplished.

The ground damage was negligible due to winter logging. The Smartwool Company volunteered during their annual environmental day to pile the slash and rebuild the buck and pole fence. A storm during the day caused the group to move away from the windthrow hazard of remaining trees. Ten trees came down during the storm. A dozer was used to get the rest of the slash out of the campground. There are plans to have the Smartwool folks come back to plant trees. The nursery will be growing 2.0 and 3.0 stock trees for planting. The remaining trees will be removed to reduce windthrow hazard prior to opening the campground.

In hindsight, all trees should have been removed from the beginning. Spraying was not very effective, partially from the fact that due to lack of funds, a spraying cycle was missed so the campground went three years between treatments instead of two.

IDT Team Evaluation

Resource Area	Evaluation
Scenery	Planting trees – both spruce and lodgepole would be beneficial to visuals. The existing trees will likely die and have to be removed. Scenery is not bad with grass and small trees. The only issue is lack of shade.
Aquatics	Looks good.
Recreation	There is some aspen in the area, possibly could transplant trees into campground. Campground has a history of problems – including a blowdown event in 1997. This is a big change, but this campground will become more popular with Seedhouse campground closed due to hazard trees.
Timber	Applaud district for assessing the problem and pushing for a solution.
Wildlife	The project was consistent with the forest plan.

Renewable Resources	This is a much more cost effective approach than the service contract. Good Job! This will help offset high costs elsewhere.
Regional Office Planning	The campground does not have screening, but does have good views now. Will improve as trees regenerate.
HPBE District Ranger	Commend district folks for problem solving and finding solution with a local timber sale.
Deputy Forest Sup.	Good opportunity to use the local timber sale and winter logging to accomplish the project.

Summary

Using the adjacent timber sale accomplished the project quickly and with little cost. Working with partners for rehabilitation was great cooperation. The campground is altered, but is not destroyed and will recover. In hindsight, the district should have taken out all the trees since the remaining trees are now blowing over. Winter logging is a good way to minimize disturbance.

July 10, Stop 3 Mountain Parks Electric.

Mountain Parks Electric needed to replace power poles along Rabbit Ears Pass. In Addition the powerline was too low and in winter created a safety hazard to snowmobilers. Approximately 50% of the poles were in wetlands, this type of project falls under a nationwide 404 permit (utility lines).

The district and the power company attempted to avoid wetlands and an archeological site during the project. The position of one pole was changed to avoid a fen. The project needed to continue despite wet conditions. The district met with the company on site and felt that there was good communication with the foreman. The project was completed in September which was wet that year.

A backhoe was used, which was not consistent with the special use permit. The company was requested to install waterbars on the track made by the backhoe, but they were not done well. The Rocky Mountain Youth Corps was used to rehab the trail and seed.

The hydrologist worked directly with the equipment operator on the next section, which was implemented with very little impact.

Internal communication could also have been improved. The archeologist worked with the company to avoid an archeological site, which resulted in moving the disturbance to an area of wet soils. Areas with populations of Rabbit Ear's Gilia were flagged and showed in the field to Mountain parks, but when implemented, these populations were impacted.

IDT Team Evaluation

Resource Area	Evaluation
Planning	It was good that the district acted on issues during project implementation.
Scenery	It is nice that wood poles were used instead of galvanized. Wood poles blend well with the surrounding landscape.
Engineering	The rehabilitation looks great. There may be illegal ATV use and should consider doing work to hide the approaches to the track along the electric line.
Aquatics	The process was good – the IDT looked at pole placement with the

	company.
Botany	Tried to minimize impacts but it is very discouraging. Should increase internal communication on revegetation as well. The policy is to not seed areas that will likely reseed naturally.
Recreation	This may not be a large ATV use area as this is not a dispersed recreation area in the summer. Special use projects – need to manage and designate access routes for utility permits. Will have future access needs along this route.
Heritage	Internal communication is key, if one resource says to move a pole, it can impact a different resource.
Timber	There was a time lag in the process – it originally was a categorical exclusion, then became an EA. This contributed to the urgency of implementation.
Wildlife	The design criteria about Boreal Toads were not followed.
Renewable Resources	Kudos to the district ranger for sharing this project. We could have used cost recovery to complete the rehabilitation. We need to work out how to oversee projects like this.
Public Service and Infrastructure	Things don't always work out as planned. Kudos to the district that the problem was caught and the damage repaired.
Regional Office Planning	It is good that the forest is evaluating all projects and not just those that went well. Good group introspection. The planning on this project was good, need to figure out how to improve project oversight. It is common that utility companies do not understand our rules. The Rocky Mt. Youth Corps did a good job on the rehabilitation.
HPBE District Ranger	Our lands staff is zoned and has too many projects to be the point person on a project like this. The contractor was amenable to having the FS out here. The FS rep needs to have the authority to stop the action.
Deputy Forest Sup.	The district did a good job responding to this project. This is a good reminder that permits have established uses prior to being regulated. Need to educate the permittees. SU permits can go wrong in a hurry.

Summary:
Good planning and communication with the utility company. Need to improve the internal communication – have a more formal IDT process for projects like this. We should evaluate how we approach long term lands permits and make sure they are in compliance. We should always try to have a person on the ground when they are working in the sensitive areas. The Rocky Mountain Youth Corps can do good work.

July 10, Stop 4 Windy Ridge Turnaround

Windy Ridge is a Special Interest Area. There are tours here from Yampatika to bring in school kids. The district received NFIM funding to do the assessment on the SIA and develop a management plan. Access was a problem, so a road and parking area was designed and constructed for the permittee and school groups. The project also repaired an old timber road. The project improved the trailhead and decommissioned an old road. The turnaround area is very visually evident. As this is not an official trailhead, the district did not want to see this as a recreation site but as an outdoor classroom. The district should have considered that, if this was a section of the CDT, then this is a trailhead. As this is not an official trail, the district tried to keep it off the forest map.

There were many issues during the NEPA process such as: is this recreation or travel management? There was no revegetation plan for the turnaround. There are watershed issues with the road that was decommissioned as it was very eroded. The turnaround was needed for safety, as the buses could not turn around on the main road. The cutbank is large because gravel was taken for a large culvert nearby. The district did look for other access routes, but did not find them. If the road to the cultural site had been maintained instead of decommissioned, it would have been easier for people with disabilities to access.

The district should consider additional work to revegetation the cut slope. The district anticipates that Yampatika will take a more active management role for this site.

IDT Team Evaluation

Resource Area	Evaluation
Planning	The SIA assessment was a good use of NFIM funding, good job.
Scenery	Would have been good to have had more discussion about the turnaround. Consider using vans instead of a school bus as the new turnaround parking is not suitable for large school buses.
Engineering	By not calling it a parking area, it did not follow standard design specs. The area should probably have been built larger.
Recreation	This project did create another site to maintain. Hazard trees need to be addressed. Should think about if we want to manage this as a trailhead. Do not know when the CDT will be developed.
Heritage	Appreciate new eyes looking at this. There were lots of details and lots can go wrong. Takes a lot of effort to include all the resource concerns.
Wildlife	Did decommission the road which is beneficial to CRCT and avoids rare plant habitat. The turnaround may have an impact on lynx.
Renewable Resources	The cut slope needs more work to revegetate and the edge of the turnaround area is a safety issue.
Public Service and Infrastructure	Agree that the project needs to be finished – by revegetating the cut slope and addressing the safely concerns. This was not implemented exactly as intended. We should also recognize that when you move dirt it doesn't look good at first.
Regional Office Planning	Looks like the edge of the parking area is a safety concern – could put up boulders or something on the edge. Concerns over more people knowing where the site is.
HPBE District Ranger	No one likes the cut bank. The Windy Ridge SIA management has been an ongoing safety issue and was a larger issue when the buses tried to turnaround on the main road.
Deputy Forest Sup.	Understand the importance of facilitating education. May have needed more internal cooperation between resources.

Summary

NFIM funds were used for a good use – the SIA assessment. It included multiple projects and a management plan for the SIA. This could be used as an example for other SIA management plans. Safety issue on the turnaround and the cut slope needs to be reshaped.

This road should be converted to a level 3 road. It currently is not on the system as that would mean it would end up on the forest map.

Best Management Practice Monitoring

Introduction

Evaluating Best Management Practices[9] (BMPs) and Design Criteria with regard to implementation and effectiveness is a critical step to ensuring compliance with Forest Plan Standards and Guidelines for the soil, water , riparian, wetland, and aquatic resources, as well as the Clean Water Act (33 USC 1251 etc). The Routt (USFS, 1997) and Medicine Bow (USFS, 2003) Forest Plans incorporated Standards (currently called Management Measures) and Design Criteria from the Region 2 Watershed Conservation Practices (FSH 2509.25) Handbook. If used properly, Watershed Conservation Practices (WCPs) will meet Federal and State laws and regulations, including State BMPs. The WCPs consist of Management Measures and Design Criteria that are used to achieve specific management objectives that fit into five basic areas: hydrologic function, riparian areas and wetlands, sediment control, soil quality, and water purity. The results of this monitoring effort are used as a feedback mechanism to modify land management activities, adjust WCPs, or recommend changes to State water quality standards as needed.

BMP evaluations were funded through NFIM with a target of ten sites to be monitored in FY08. Projects in which the NEPA analysis was completed under the Routt and Medicine Bow revised Forest Plans were selected for evaluation. BMP evaluations were completed using the 2008 Draft Washington Office BMP evaluation forms when possible.

A total of ten evaluations were completed. Of these ten, four evaluations focused on recreation projects, four evaluations related to roads, one evaluation addressed a lands project and one minerals project was evaluated. The completed evaluation forms are a record of the general results of the assessments, but do not capture all of the visual surveys and qualitative impressions gathered from field observations. The following is a brief narrative description of the evaluations in each BMP category, general trend indications, and how the evaluation reflects on the implementation of WCPs and Forest Standards and Guidelines.

RESULTS

Recreation: Evaluation of recreation projects included 1) the 2006 Sunshine lift replacement on the Steamboat Ski Area on the Hahns Peak-Bears Ears Ranger District, and 2) a section of new trail construction on the Continental Divide National Scenic Trail on the Parks Ranger District.

Sunshine lift replacement: There is a set of general ski area BMPs that have been incorporated into the Special Use Permit, but no specific BMPs for ski area lift replacements. However, for lift replacements the same general concepts apply with regard to minimizing ground disturbance and soil compaction, minimizing new connected disturbed areas, revegetating disturbed areas, and avoiding wetlands.

Where implemented, BMPs and project specific design criteria were effective at minimizing effects to the soil, water, riparian, and wetland resources. These included minimizing the disturbed area to the extent feasible, minimizing the connected disturbed area, and reducing impacts to wetlands to the extent feasible. The project successfully met these objectives.

[9] For the purpose of this evaluation, BMPs and Design Criteria are used interchangeably as they serve similar purposes of protecting resources.

Best Management Practices were not properly implemented to promote revegetation of disturbed sites to facilitate infiltration and minimize surface erosion. This was evident at both the lower terminal in the area of the lift maze, and in the area surrounding the upper terminal. The lower terminal area would have benefited from timely application of seed and mulch, as well as applying thicker mulch. Revegetation was sparse, and the team felt that more timely and intensive mulching would have promoted revegetation. The ski Area did take some adaptive measures to promote revegetation including closure of the area to keep people off the site, and re-grading to meet the final grading plan.

The area of the top lift terminal has been a chronic source of concern due to multiple disturbances on a high elevation site with minimal natural topsoil. Options to address this would have included thicker mulch which would have retained more moisture and prevented raindrop impact, but the extent of past and present disturbances in a location with little topsoil may also have warranted hauling in of topsoil. However, the area of greatest concern is generally flat or with a low slope, so extensive surface erosion has not occurred. Prior to implementation, a discussion with the proponent and agreement on revegetation expectations would have resulted in more timely and complete implementation of revegetation BMPs.

There were several incidents during implementation that appeared to have been beyond management's control. The new lift did not arrive on site until September which forced the construction period later into the fall than desired. Due to pressure to get the lift installed on time for the upcoming ski season, there were periods when the ski area ended up operating on wet soils. While BMPs include not operating on wet soils or during periods of heavy precipitation, the time constraints forced these operations to occur. The risks of not always being able to implement BMPs on projects should be considered during the planning phase.

Conclusion: Where implemented, BMPs were generally effective at meeting Forest Plan Standards. However, some BMPs were not fully implemented (mulching of bare soils, operating on wet soils), which resulted in effects to the soil and water resources. Some site specific cases may require more intensive measures such as an inventory of existing topsoil, and possibly hauling topsoil to an already heavily disturbed site in order to meet Forest Plan Standards. Project timing and potential delays due to weather should be considered in the planning phase with supplemental direction developed if needed.

Continental National Scenic Trail: The section of trail evaluated is between Bowen Pass and Illinois Pass on the Parks Ranger District. This non-motorized trail was constructed in 2005-2006 by the Continental Divide National Scenic Trail Crew. Project specific BMPs include:

- Avoid trail construction directly down the fall-line
- Locate trails to provide for natural drainage features and roll with the terrain
- Location review by an engineer to ensure optimum location and adequate drainage to minimize surface erosion, delivery of sediment to the stream system, and impacts to wetlands.

Pertinent Design Criteria from the WCP (FSH 2509.25) were also incorporated into the NEPA document.

The review team found the project specific BMPs and Design Criteria from the WCP had been implemented, and were effective at protecting soil, water, and wetland resources. In the

initial planning phase trail location had been adjusted to avoid wetlands including natural springs. Drainage structures including water bars were appropriately spaced, and took into consideration trail grades and slope steepness. Water bars and other drainage structures were built to withstand use over time, but not hinder trail use. The trail rolled with the terrain where possible to provide natural drainage features that would not require maintenance over time. Stream-trail crossings were appropriately hardened to minimize the connected disturbed area.

Conclusion: Project specific BMPs and Design Criteria from the WCP were appropriately implemented, and effective at protecting the soil, water, riparian, wetland, and aquatic resources. The success is due in part to good project planning resulting in a trail location that minimized impacts to these resources, a trail with natural drainage features, and construction by an experienced trail crew. This review did not produce any recommended changes to BMPs or Design Criteria, and Forest Plan Standards and were met for these resources.

Devil's Pass ATV Trail: The Laramie Peak Travel Management Decision decided to convert portions of NFSR 610 and 610C into a motorized trail. These roads were rough 4wd roads, which crossed two wet areas and accessed a dispersed site in a wet meadow / aspen grove area along a small creek. The project also included designating a parking area at the trailhead.

The following relevant Design Criteria were included in the decision in addition to the BMPs in the Watershed Conservation Handbook:

- Rip, waterbar or use other methods to prevent surface erosion when closing roads.
- Provide a 30.5 m (100 feet) buffer for all streams that might have riparian areas, but does not have associated wetlands.
- Provide a 30.5 m (100 feet) buffer for all streams that might have riparian areas, but does not have associated wetlands.
- Reclaim and restore decommissioned roads by recontouring to a natural appearing landscape contour. Reseed with recommended native seed mix to reduce soil contrast and to better blend with the surrounding landscape.

The State of Wyoming Motorized Trail crew converted the road into an OHV trail by narrowing up the trail, using rocks and logs and ripping to decrease the width. The crew also installed water bars to improve drainage. Geotextile fabric was installed in the wet areas to eliminate the muddy, heavily rutted sections of the trail. The crew also built a causeway across a wide wetland / stream crossing. This diverted the trail away from a dispersed site in the riparian area. The crew placed boulders to prevent access to the dispersed site, but later the district built a buck and pole fence to block access.

Conclusion: The design criteria related to water resources were followed in this project and follow up monitoring has shown that the project has reduced impacts on the wetlands and streams impacted by the trail. The design criteria and BMPs were shown to be effective. The site specific trail design was planned during a field visit with watershed, recreation, engineering and the State Trail Crew, which is one reason this project was successful.

South Fork Big Creek Trail Bridge: This project was included in the Blackhall-McAnulty Decision on the Brush Creek-Hayden RD, which primarily included timber harvest and road decommissioning projects. This project was also reviewed by the district and is included in the district project evaluation section above. The decision included design criteria from the Watershed Conservation Handbook, in addition to other relevant design criteria, which are listed in the district project review section above.

The bridge was built across South Fork Big Creek, and designed to accommodate non-motorized trail use, such as horse, bicycle and foot traffic. Most of South Fork Big Creek has a wide floodplain with meadow and willow vegetation. The best site was chosen, which avoided beaver ponds and wet meadow areas, however the site chosen for the crossing did have a broad, flat floodplain as this could not be avoided.

Ramps on either side of the bridge were built to access the bridge, and to provide accessibility. The ramp on the east side of the bridge follows the creek, and entailed placing fill up to 5 feet deep along the streambank in the floodplain. During construction, a backhoe travelled back and forth across the stream channel carrying and placing the fill on far side of the creek. It is likely that the fill on the streambank will be vulnerable to erosion during high flows as the stream channel is now restricted through this area.

The original plan for the bridge did not include erosion control as it was not anticipated that the streambank would be disturbed, or that there would be fill placed on the streambank. In response, after the bridge was built, seed and erosion cloth was placed on the disturbed areas adjacent to the creek. Rocks and logs were placed along the edge of the stream channel where the backhoe had crossed the stream, to rebuild and reinforce the streambank.

Conclusions: Forest Plan Standards and Design criteria relating to maintaining stream channel and riparian conditions and to minimize sediment delivery to streams were not followed.

Recommendations:

- Improve coordination between appropriate specialists during the design and construction phase of the project to minimize impact on water resources.
- Anticipate impacts during project implementation so that the appropriate mitigation can be designed and implemented.
- Monitor the bridge site to determine if additional stabilization or revegetation is needed.

Roads: The road projects evaluated included 1) construction of the Mount Werner Water Tank road on the Hahns Peak-Bears Ears Ranger District, 2) replacement of an old stringer bridge with a bottomless arch culvert on the Illinois River on the Parks Ranger District, and 3) replacement of a corrugated metal pipe with a bottomless arch culvert on Pelton Creek on the Laramie Ranger District.

Mount Werner Water Tank Road: This road was constructed to build and maintain a large water storage tank for fire-fighting in an adjacent residential development. There were no alternative locations off Forest that would have met the Purpose and Need. The road design is steep, and needed to accommodate approximately 200 concrete trucks. This requirement

led to substantially more ground disturbance than is seen with typical road construction on the Forest.

Planning for this road was done with careful coordination between the proponent and Forest engineering, hydrology, and lands staff. The design limited ground disturbance to the extent feasible, although still resulted in 25 foot high through cuts. Erosion control and avoidance of wetlands were two key issues. After careful consideration and review of two potential locations, the location with the least impacts to wetlands and least ground disturbance was chosen. Several field reviews were conducted with the proponent to refine design criteria including road location, erosion control, and culvert placement to minimize effects to water related resources. As a result of the upfront coordination and design work, no project specific BMPs or design criteria were identified in the NEPA document.

The field review found that the proponent had implemented the project according to plan. Weekly meetings with the Forest Service, proponent, and contractor were held throughout the life of the project, and these were documented in weekly meeting notes. Adjustments were made during implementation in coordination with Forest engineering and watershed personnel to accommodate conditions on the ground. Most of the erosion control measures including rock aprons at culvert outlets, erosion control matting on through cuts and cut and fill slopes were properly implemented. The spacing of drainage structures (relief culverts) was sufficient, and took into consideration the topographic landscape.

While implementing the road project, the proponent also offered to remove an abandoned diversion structure in Burgess Creek at no additional cost to restore hydrologic function and ensure aquatic passage. While not identified as a specific requirement during project planning, the proponent recognized the need and chose to address this issue. This diversion structure removal was an additional benefit to the water and aquatic resources on the Forest.

While all BMPs incorporated into the design were properly implemented, a rain event during a critical time resulted in excess surface erosion from cut slopes. This resulted in deposition of substantial sediment in an intermittent draw. Preventing this occurrence would have been difficult as it would be nearly impossible to create the cut slopes and through-cuts, then immediately stabilize. Following this event, the rock apron at the outlet of the culvert where this impact occurred was extended, and the elevations adjusted to make a smoother transition with the culvert outlet and the natural drainage in order to accommodate any future events.

Conclusion: The project was implemented as designed. Project design was generally effective as minimizing surface erosion, impacts to wetlands, and connected disturbed areas. Changes were made to the design during construction with input from a watershed specialist and engineer to better accommodate conditions on the ground. Sedimentation to the stream system did occur due to the unforeseen timing of one intensive rain storm. This event would have been difficult to mitigate. While the design and implementation were good, particularly for long-term stabilization, short-term impacts to the soil and water resources still occur due to unforeseen circumstances.

Illinois River Culvert replacement: This project replaced an old wooden stringer bridge with a bottomless arch culvert. The old bridge was a safety hazard, and had little freeboard to accommodate flood flows or pass large woody debris. The culvert was sized consistent with the bankfull width in order to better facilitate sediment and bedload transport, and mimic

the natural stream bottom. While the old road is currently managed as a trail, and a trail bridge would normally have been sufficient, this old road it is also used by a snow grooming machine. The replacement structure needed to be able to accommodate the width and weight of the snow groomer.

The culvert was installed consistent with BMPs for constructing/reconstructing road-stream crossings. Minimal impacts were seen to the adjacent riparian area and floodplains. What disturbance had occurred was recovering well.

The Illinois River at the project site is a low gradient meandering stream with a wide floodplain. In order to accommodate a snow groomer, the running surface had to be 12' wide which resulted in a 38 foot long culvert; this is approximately a 25 foot longer structure than what was currently in place. The length of the culvert ended up with the culvert encroaching on a meander bend. This resulted in excavation of the outside bank, leaving a raw disturbed bank downstream which is susceptible to erosion. The width of the culvert was consistent with the WCP Design Criteria to sustain bankfull dimensions and facilitates passage of flood flows and debris, and favor bottomless arches when possible, the length was not consistent with the WCP Design Criteria 'install stream crossings on straight and resilient stream reaches, as perpendicular to flow as practicable.' The effects of the longer culvert on stream channel function was not fully considered or addressed in the planning stages. Better planning and consideration of the full effects of the project would have resulted in less impacts to the stream system.

Conclusion: Lack of detailed project planning led to impacts to the water resource due to unforeseen consequences of the length of the culvert. Since this consequence was not anticipated, no armoring of the disturbed area was planned, and therefore not implemented. Detailed project planning is critical to anticipating all potential effects, and minimizing impacts to resources.

Pelton Creek Culvert replacement: This project replaced an existing corrugated metal pipe with a bottomless arch culvert. The old culvert had little freeboard to accommodate flood flows or pass large woody debris, was often plugged by beavers and the flows overtopped the road on occasion. The replacement structure needed to be able to accommodate the width and weight of the normal vehicle traffic that accesses the Pelton Creek campground.

A site-visit with hydrology and fisheries staff and the Forest road crew was conducted before culvert replacement in order to determine the best methods to divert the water while replacing the culvert. Road crew personnel replaced the culvert. The seasonal fisheries crew assisted with application of erosion control measures after the culvert was replaced.

A temporary diversion channel was constructed around the existing culvert in order to divert the water around the existing culvert and allow installation of the new culvert. This allowed most of the excavation work to be conducted without flowing water, thereby minimizing turbidity and suspended sediment input into Pelton Creek. Rocks were placed on the road fill at the inlet and outlet of the culvert during installation in order to prevent erosion of road fill during higher runoff. Erosion matting and seed was applied after culvert installation to provide immediate erosion control (matting) and long term erosion control (seeding for revegetation).

Conclusion: The culvert was installed consistent with BMPs for constructing/reconstructing road-stream crossings. Minimal impacts were seen to the adjacent riparian area and floodplains. Review of the project revealed that the Forest Service did not obtain a turbidity waiver from the Wyoming Department of Environmental Quality for this project. While BMPs were implemented to minimize turbidity, it is recommended that a turbidity waiver be obtained for this type of project in the future.

Road Decommissioning This project included road decommissioning conducted under the Eastern Snowy Range Travel Management decision. Approximately 117 miles of unnecessary roads and trails were decommissioned on Laramie District during FY08. Treatments included signing, fencing, physical barriers placed on roads (e.g. small berms, debris), ripping road templates and removing road fill from stream crossings. Best Management Practices monitoring focused on work completed at stream crossings. A turbidity waiver was obtained from the Wyoming Department of Environmental Quality. A 404 permit was obtained from the US Army Corps of Engineers.

Best Management Practices were utilized to protect existing water uses and maintain turbidity and sedimentation at the lowest practicable levels. At crossings where road fill was removed most ground disturbing work was completed within one hour, although a few sites with more intensive work took up to one day to complete. Erosion matting and seed was applied at all perennial stream crossings and wetlands. Due to the small size of the streams involved, turbidity monitoring was not conducted on any of these streams.

Conclusion: Implementation of the Best Management Practices were effective at reducing sedimentation and erosion at road crossings which were rehabilitated. The following are recommendations for similar projects in the future:

- Consider timing implementation of the project to minimize potential impacts to amphibians. Some of this work was completed early in the summer when amphibians were in early life stages and confined to water. Completing the work later in the summer once amphibians were able to get out of the water would reduce impacts.
- Consider use of heavy equipment with a bucket, rather than a blade, for excavation at stream crossings and wetlands. Excavation of a few sites was completed with a bulldozer blade pushing material out of the valley bottom. An excavator with a bucket was used at other sites. Impacts to water resources and adjacent wetlands and riparian areas was reduced with the use of an excavator lifting material out of these areas with a bucket (rather than pushing with a blade).
- Work with WYDEQ to develop guidelines as to the type of stream and activity where turbidity monitoring is feasible and worthwhile, and identify those streams where turbidity monitoring may not be required as part of a turbidity waiver.

Lands The lands project evaluation focused on the replacement of the Mountain Parks Electric line across Rabbit Ears Pass from NFSR 302 east to Muddy Pass on the Hahns Peak-Bears Ears Ranger District. The Forest reviewed and adjusted pole locations where possible to avoid wetlands while simultaneously avoiding impacts to heritage sites. This resulted in the best location having approximately 50% of the poles in wetlands. In order to meet Forest Plan Standards and Direction, the following project specific Design Criteria were developed to supplement the WCP Design Criteria:

- Have a watershed specialist work with personnel from Mountain Parks Electric to identify where power poles can be relocated to avoid wetland and riparian areas.

Where relocation out of wetland and riparian areas is not possible, follow all other specified design criteria regarding access routes, stream crossings, timing etc to minimize impacts to wetlands and riparian areas.

- Require that a watershed specialist work with the proponent on site, prior to implementation, to identify access routes for each individual pole that minimizes impacts to wetlands, soils, stream courses, and riparian areas.
- Use a tracked vehicle or other low PSI vehicle whenever a wetland or riparian area must be crossed.
- Per Army Corps direction, any equipment access through the wetlands should be on mats when the equipment's tracks would be in direct contact with the ground to prevent disturbance of the root zones.
- Where access routes must cross a riparian area or wetlands, do not remove any vegetation, but rather run over vegetation. This will protect the soil surface and prevent soil compaction and development of ruts.
- If necessary to cross a stream course, use corduroy, planking, or other measures to protect the streambanks. Remove all corduroy or any other measures placed in the stream course prior to the following spring runoff.
- If stream courses must be crossed, restore the original cross-sectional area and streambank following completion of the project, prior to the following spring runoff.
- Minimize the number of trips to each pole to prevent soil compaction, ground disturbance, and impacts to vegetation.

A portion of this line was replaced in 2007. During that time the contractor operated on wet soils with a rubber-tire back-hoe, resulting in extensive rutting through both uplands and wetlands. In this case, the Design Criteria of 'Operate heavy equipment for land treatments only when soil moisture is below the plastic limit' was not implemented, nor was the project specific Design Criteria of 'Use a tracked vehicle or other low PSI vehicle whenever a wetland or riparian area must be crossed.' Forest personnel had met with the contractor prior to implementation, but the contractor still did not follow these design criteria. Lack of proper BMP implementation resulted in substantial impacts to the soil, water, and wetland resources.

Replacement of the line was completed in 2008. Forest lands and watershed personnel met with the contractor prior to implementation in 2008. Follow up monitoring found that the project specific design criteria as well as appropriate Design Criteria from the WCP were implemented. The greatest impact seen was from a few tracked vehicle tracks on upland bare soil sites. The contractor ceased operations during a period of heavy rainfall and waited for drier ground conditions before resuming operations.

Where wetlands had been crossed the use of a low ground pressure tracked vehicle left only minor visual impacts with no impacts to the soil, water, and wetland resources. The use of corduroy for crossing of perennial and intermittent stream channels was very effective at protecting stream channel integrity (Photo X). Although operations occurred in highly sensitive areas including wetlands, there were little effects to the soil, water, or wetland resources.

Conclusion: Lack of BMP/Design Criteria implementation in 2007 resulted in substantial impacts to the soil, water, and wetland resources. Proper implementation of project specific Design Criteria as well as applicable Design Criteria from the WCP resulted in successful implementation of the project in both upland and wetland areas with minimal impacts to resources in 2008.

Summary

The following summarizes findings of monitoring the implementation and effectiveness of BMPs and Design Criteria in 2008:

1) BMP monitoring did not indicate the need for any changes to the Forest Plan. BMPs/Design Criteria, when properly implemented, are generally effective at protecting the soil, water, wetland, and aquatic resources, and meeting Forest Plan Standards and objectives.
2) Non-routine projects such as ski area lift replacements and powerline replacements often require adaptive project specific BMPs/Design Criteria to meet the local conditions and purpose and need of the project. Proper design and implementation of project specific Design Criteria can be effective at protecting the soil, water, and wetland resources, and meeting Forest Plan Standards and direction.
3) Even with specification of the appropriate BMPs and Design Criteria, and proper implementation of BMPs/Design Criteria, unforeseen and uncontrollable factors such as weather or equipment delays (Sunshine lift) can still result in impacts to the soil, water, and wetland resources from ground disturbing activities.
4) Comprehensive planning is critical to minimizing impacts to resources. Consideration needs to be given to planned activities, but also consider contingency plans for when unforeseen circumstances may arise.

Table 70. Summary of BMP monitoring by project type.

Project type	Proper Implementation?	Is BMP effective?	Recommendations
Recreation projects	Yes/No	Yes	Develop project specific Design Criteria as needed to address local conditions; adapt as needed during implementation. Coordination during planning, design and implementation phases is critical to minimizing impacts to resources.
Roads projects	Yes	Yes	Adapt project specific Design Criteria as needed during implementation; comprehensive planning is critical to minimizing impacts to resources
Lands projects	No/Yes	Yes (when properly implemented)	Lack of BMP implementation led to considerable resource damage. Work with proponents to identify clear expectations during ground disturbing activities; monitor during project implementation. If implemented properly, BMPs can be very effective, even in sensitive areas such as wetlands.

District Project Monitoring

Brush Creek-Hayden Ranger District

Holroyd Timber Sale

The purpose of this project is threefold: to maintain and restore ponderosa pine and aspen to their historical range; to help preserve the existing ponderosa pine by monitoring, suppressing, and salvaging the diseased and dead trees resulting from dwarf mistletoe and mountain pine beetle activity in the Holroyd area; and to reduce the amount of sediment currently flowing unimpeded into the stream adjacent to NFSR 498.

Due to changes in the market, deterioration in the quality of the timber, and increasingly heavy beetle infestation, changes were made to the project, the prescriptions, and the contract. Units 1 and 2 were logged, but Units 3 and 4 were not. No ponderosa pine or Douglas fir trees were harvested. The Forest Service completed the shrubland burn, and some of the road maintenance was completed on NFSR 498.

Objectives of the Review: 1) To determine if the project is consistent with the Holroyd Timber Sale & Prescribed Burning EA and DN, Forest Plan Standards & Guidelines, and FS Manuals and Handbooks, and 2) To determine how well the actions achieved the desired outcomes, particularly since all of the planned timber harvesting has not been completed, and 3) To determine the next steps needed to achieve the desired outcomes, if needed.

Standards and Guidelines Related to Review Objectives:

- Forest Plan direction (III-4) is to manage fish and wildlife habitats, including plant diversity, to maintain viable populations.
- Forest Plan direction (III-14) is to maintain structural diversity of vegetation.
- General direction in the Forest Plan (III-16)(5) is to manage aspen for retention where ever it occurs.
- General direction in the Forest Plan (III-34)(1) is to both use commercial and noncommercial silvicultural practices to accomplish wildlife habitat objectives.
- General direction in the Forest Plan (III-36)(3) is to improve habitat capability through direct treatments of vegetation.
- Forest Plan direction (III-138) for the 4D management area is to maintain aspen clones and clearcut, prescribe burn, or treat aspen mechanically to promote suckering and revegetation of aspen patches.
- Forest Plan direction (III-147) (3) for 5A management area is to manage grasslands and grassland shrub types to improve wildlife habitat. Improve habitat conditions by increasing forage available to wildlife and enhancing vegetation diversity.
- Forest Plan direction (III-155) (2) for 5B management area is vegetation treatment of forested areas will be used to work towards a forest environment that provides effective forage and cover for wintering big game animals. Maintain at least 30% of the area in created or natural openings (III-153) (1a).

The following Mitigation Measures are also included in the Decision:

- When determined to be needed by the rangeland management specialist, seed all clearcuts and other disturbed sites, with native forage species to preclude noxious weeds.
- Scarify and seed to grass of all temporary roads upon completion of all timber sale activities.
- Retain snags and recruitment snags according to Forest Plan Guidelines (III-15). Retain snags in clusters or snag farms on the edge of units to reduce the chance of blowdown.
- Schedule prescribed burns so as not to affect neotropical migratory bird nesting. Generally any time before April 30 and anytime after September 1. A field inspection will verify correct timing.
- Prescribed fire activities will be governed by the use of an approved Burn Plan. The Burn Plan will specify items such as personnel and burn organization, goals and objectives, protection of sensitive features, finances, prescribed fire prescription parameters (i.e. weather and fuel conditions as well as output variables such as rate of spread and flame length), smoke management, firing/ignition/holding procedures, public information, safety, escaped fire contingency plan, and complexity level analysis.
- To further assure there is no disturbance to area heritage resources, an archaeologist will be present to monitor all prescribed burning activities.
- To minimize new lodgepole pine regeneration in areas that will not be underburned, criteria will be included in the timber sale contract that will require the purchaser to whole tree skid and pile all lodgepole pine harvest slash. Following sale completion these piles will be burned to further reduce the spread of lodgepole seed.
- All harvest operations will be restricted to dry and/or frozen ground conditions.
- To reduce potential adverse effects to the area's water resources, all pertinent Wyoming DEQ recommended Best Management Practices (BMPs) for the implementation of silvicultural activities will be used.
- All proposed harvest units along NFSR 498 will have required whole tree skidding, stump heights of 4" or less, and residual tree protection within 100' of this major District travel route to meet visual quality objectives for partial retention.
- Where possible, all harvest unit landings along NFSR 498 will be located at least 100' from the road.
- To address concerns for maintaining area aesthetics when viewed from Wyoming Highway 230, the bulk of the harvest acreage (91%) will be treated with a shelterwood treatment, maintaining the area's current forested appearance. Required whole tree skidding, piling, and later—burning of lodgepole pine slash within shelterwood units will further maintain the vicinities' aesthetics by reducing the level of slash.

<u>Observations</u>
The result of the harvest in Units 1 & 2 is good diversity and aspen sprouting. There are some ponderosa pine seedlings, but not in sufficient numbers. There are excessive numbers of lodgepole pine seedlings growing in the harvested units. Sediment continues to flow unimpeded into the stream adjacent to NFSR 498. Some road work was completed, but the

road and wing ditches are facilitation sediment deposit into the stream. The Standards and guidelines are being implemented on the ground.

Figure 37. Field review of Holroyd Timber Sale

Recommendations

- Collect ponderosa pine seed for broadcast seeding the harvested units and for the seed bank. Ponderosa pines in the area are infested with beetles. Natural regeneration is limited with many more lodgepole seedlings growing in harvest units. Ponderosa pine is not regenerating well even with scarification and seeding. Seed viability is lower with the older trees. Collect the seed ASAP since preserving this seed population is important.
- Use prescribed burning in harvested units to reduce lodgepole pine and increase ponderosa pine. The EA and DN state that prescribed burning will be used in units after timber harvest to enhance aspen and ponderosa pine regeneration. Harvested units have good diversity of aspen, forbs, & grasses, but lodgepole pine predominates with limited ponderosa pine seedlings.
- Plant ponderosa pine seedlings. Since only units 1 & 2 were logged (due to severe market fluctuations and catastrophic conditions from beetle infestations), the objectives of the project have not been fully met. Ponderosa pine seedlings are growing in the harvested units, but not as many as expected or wanted. Pop Springs seedlings grew quickly enclosed in the plastic cylinders.
- Treat weeds. Increase communications so that personnel responsible for the weed program know when the timber harvest is complete. Inventory and treat weeds immediately after the timber sale and for about two years after the harvest is complete.
- Complete additional work on NFSR 498 to reduce sediment transport into the adjacent stream. Legacy roads and trail funds could fund outsloping the road, angling the wing ditches to reduce sedimentation, and retaining vegetation along the sides of the road

to filter road sediment. The road is currently located too close to the stream, funneling lots of sediment into the stream. The current conditions do not satisfy the standards of the State of Wyoming. The hydrologist who analyzed this project in 2001 wrote, "*Unless measures are taken to reduce sediment contributions to the watercourse adjacent to FDR498, Forest Plan consistency will remain unchanged. Surveys suggest that conditions in a specific analysis area site are inconsistent with items #4 (FP III-51 #6, FP III-217 #1) in Section 9, T.12N, R.81W, where road sediment has affected the adjacent stream channel.* "

- Pursue Potential timber resale opportunity. Remaining units may be too small to be economically feasible at present, but does include easy, early season access.
- Ensure big draws within the units are protected in the contract. Sale administrator protected the large draw in one of the units, but it is important to ensure support in the contract.
- Ensure interdisciplinary team involvement in changes required after the NEPA decision. The project changed from EA to implementation in response to beetle infestation, proposed eradication of lodgepole pine in units, and lack of seed source.
- In the future, consider removing organic top soil on landings and piles that will be burned, then returning the top soil after the burn is complete. This would reduce sterile soil patches and weed growth.
- Keep the interdisciplinary team informed about what funds are available for post-harvest work and what post-harvest work has been completed.
- Seek alternatives to Dozer scarifying for regeneration. It tends to exceed the Forest Plan and is too rough and deep.
- Put protected areas, such as water, on maps for implementers.
- Provide new employees with the time needed to become familiar with old and continuing projects to make sure work on previously started projects is completed.
- Interdisciplinary teams should review design criteria and mitigation measures with implementer to ensure follow-through.
- Identify up front who is responsible for each project-specific monitoring task identified. Limit monitoring to what is truly needed, since workloads limit time available for monitoring and, if it is written into the document, it must be done to remain in compliance.
- Continue approving temporary road and skid trail placement, as possible. Forest Sale Representative approved skid trails very successfully.

<u>Conclusions</u>

The purpose and need for this project have not yet been met. Standards and guidelines and mitigation measures have been incorporated into the project design and contract, and are effective. More work needs to be done to make this project consistent with the Holroyd Timber Sale & Prescribed Burning Environmental Assessment and Decision Notice, Forest Plan standards & guidelines, and Forest Service Manuals and Handbooks.

South Fork Big Creek Trail Bridge
The purpose of this project is to build a bridge over the South Fork of Big Creek for hikers using Big Creek Trail 471. The bridge was constructed using heavy equipment.

Objectives of the Review:

1. Determine if the project is consistent with the Blackhall-McAnulty Record of Decision (ROD), Forest Plan Standards & Guidelines, and Forest Service Manuals and Handbooks.
2. Determine whether soil and water Best Management Practices are being implemented and if they are effective.
3. Determine how well the project achieved the desired outcomes

Standards and Guidelines Related to Review Objectives:

- Construct roads and other disturbed sites to minimize sediment discharge into streams, lakes, and wetlands (forest-wide direction soil standard 2) (Forest Plan 2003:1-28).
- Stabilize and maintain roads and disturbed sites during and after construction to control erosion (forest-wide direction soil standard 3) (Forest Plan 2003:1-28).
- In the water influence zone next to perennial and intermittent streams, lakes, and wetlands, allow only those actions that maintain or improve long-term stream health and riparian condition (forest-wide direction water & aquatic standard 4) (Forest Plan 2003:1-28).
- Design and construct all stream crossings and other instream structures to allow passage of water and sediment, to withstand expected flood flows, and allow free movement of resident aquatic life (forest-wide direction water & aquatic standard 5) (Forest Plan 2003:1-29).
- Conduct actions so that stream patterns, geometry, and habitats are maintained, or improved toward robust stream health (forest-wide direction water & aquatic standard 6) (Forest Plan 2003:1-29).
- Maintain long-term ground cover, soil structure, water budgets, and flow patterns in wetlands to sustain their ecological function, per 404 regulations (forest-wide direction water & aquatic standard 7) (Forest Plan 2003:1-29).
- Manage water-use facilities to prevent gully erosion of slopes and to prevent sediment and bank damage to streams (forest-wide direction water & aquatic standard 9) (Forest Plan 2003:1-29).
- Permit water developments and movement of stream or lake sediments only when evidence exists that disease-causing organisms or undesirable species would not be introduced into otherwise uncontaminated waters (forest-wide direction water & aquatic standard 13) (Forest Plan 2003:1-29).
- Design activities to protect and manage the riparian ecosystem. Maintain the integrity of the ecosystem including quantity and quality of water (forest-wide direction water & aquatic standard 14) (Forest Plan 2003:1-29).
- On sites where dispersed recreation activities have resulted in accelerated erosion or loss of riparian/wetland function, mitigate the impacts by redirecting the use,

rehabilitating or hardening the site to minimize erosion and off-site movement of soil (forest-wide direction recreation- general standard 1) (Forest Plan 2003:1-52).

- Where it is possible to screen them, design recreational facilities to blend with the elements found in the natural landscape They should be subordinate to the overall scenic strength of the surrounding landscape (forest-wide direction recreation- general guideline 2) (Forest Plan 2003:1-52).

Mitigation Measures: Soils, Water, and Fisheries, the Watershed Conservation Practices (FSH 2509.25) and Mandatory Best Management Practices [33 CFR 323.4(a)(6)] are referenced to be followed during project implementation. Under the same section, a subsection identified as General Road Stream Crossings states that a*ny culvert installations, removals, or other in-channel construction activities on flowing streams require a site-specific erosion control plan in order to reduce turbidity and fine sediments. These projects will be evaluated to determine if a waiver to the state water quality rule is necessary [which allows a maximum turbidity increase of 10 NTU (Nephelometric Turbidity Units)].*

Observations
All Standards & Guidelines are implemented on the ground, except minimizing sediment discharge into the creek during construction. Heavy equipment repeatedly crossed the creek at the project site, affecting creek banks and bottom, and sediment discharge into the creek during construction.

Figure 38. S. Fork Big Creek Trail Bridge

Recommendations

- Improve coordination with the appropriate resource specialists during the design and implementation phases of the project to ensure compliance with Forest Plan Standards. In this case, coordination with the hydrologist would have reduced heavy equipment creek crossings and possibly changed the ramp design. The engineer designed the bridge entry and exit ramps to curve sharply to reduce the potential for erosion of the ramps in high flows. The hydrologist is concerned the curved ramps

may be more likely to erode than straight ramps with culverts. The recreation specialists may have pointed out that navigating the sharp curves of the ramps can be difficult for horse and bicycle riders. Only one bridge had been built of the two listed in the decision so coordination can be improved on the next bridge installation.

- In NEPA documents, make sure all actions meet at least one of the listed purpose and need statements for the project, describe the proposed action in detail, and show the location of the proposed actions on a map. In this case, one paragraph describes the proposed action, it is not identified on any map in the EIS or ROD, and it does not relate to any purpose and need statements in the EIS. The description of the project was vague and led to later disagreements that could have been resolved if the project had been better thought out and involved the interdisciplinary team.
- Plant more willow sprigs and transplant sedges around the bridge. Develop a plan for the dispersed recreation site, including plans for human waste. Design road closures to better keep people from using the road.
- Don't use crushed gravel as fill. Use on-site material since it is cheaper. Crushed gravel was used to fill the bridge ramps. Large 12 x 36" Douglas fir stringers were reused on the bridge supports saving a lot of money and they look great and are age-hardened.
- Prioritize needed bridges and trails based on use and other criteria. When initiating projects, make sure the program manager agrees that the project is a priority. The bridge is expensive, is not in a high use area, does not lead to an important destination, and has a limited trail distance.
- Clean heavy equipment and other equipment and material so non-natives and weeds are not brought into new areas, especially where there is disturbed soil. Gravel can transport weeds. Burr buttercup is a non-native that is growing around the dispersed recreation site.

Conclusions

Standards and guidelines were incorporated into the Record of Decision. The standards and guidelines and mitigation measures were incorporated into the project design and are effective, with the exception of the heavy equipment causing sediment discharge into the creek during bridge construction.

Douglas Ranger District

Big Bear Canyon

The purpose of this project was to convert a road into an ATV trail, as part of the Laramie Peak Travel Management Decision. The Wyoming State Trails Crew constructed a buck and pole fence and installed a gate to limit vehicles other than ATVs from using the trail.

Objective of the Review: To inspect the fence and gate to determine if they are effectively limiting vehicle use on the road.

Standards and Guidelines Related to Review Objectives: The standards & guidelines that were reviewed were those outlined in the soil, water, and aquatic section of the Forest Plan

Observations
The fence and gate were constructed during the summer of 2008, and the road has been converted to an ATV trail.

Recommendations

- Extend the length of the buck and pole fence to limit vehicles from going around the ends of the currently constructed fence and driving on the ATV trail.
- Install a lock on the gate.

Conclusions
Standards & guidelines were incorporated into the Travel Management Decision, and were incorporated into the project design, and have been implemented on the ground.

Follow-up Monitoring

- Inspect this area to make certain that only ATV travel use is occurring on the trail and that no off-trail travel is occurring.
- Monitor the archaeological site in the canyon and inspect for any disturbance.

Devil's Pass Road
The purpose of this project is to improve the condition of the Devil's Pass road and reduce negative impacts to wetlands. This area is off the Devil's Pass road at the Forest boundary. The existing road was converted to an ATV trail. Geotechnical material was placed in wet areas, the trail was rerouted to avoid impacts to wetlands, and rock was placed in low areas. A parking area was also designated and outlined.

Objective of the Review: To inspect this project, which is part of the Laramie Peak Travel Management Decision, and to determine the effectiveness of this project?

Standards and guidelines related to review objectives: The Standards & guidelines that were reviewed for this project are from the soil, water, and aquatic section of the Forest Plan.

Observations
There is evidence that ATV travel is being limited to trail use. The wetland area observed shows no signs of vehicle use and is recovering.

Recommendations
There should be further review of the area to make certain that only ATV travel is occurring on the trail and that no off-trail travel is occurring. In addition, the buck and pole fence needs to be extended at the parking area to limit the access to the trail to ATVs only. The existing road should be ripped and seeded so that ATV traffic is rerouted to the designated trail.

Conclusions
The Standards & guidelines were included in the Travel Management Decision. The standards & guidelines and mitigation measures were incorporated into the project design and are being implemented on the ground.

Laramie Ranger District

Travel Management – Eastern Snowy Range

The purpose of this project was to close two roads which were causing resource damage. Erosion matting was installed and disturbed areas were seeded to improve long-term stream health and riparian conditions in the area. These road closures were part of the Eastern Snowy Range Travel Management Decision of June 21, 2007.

Objectives of the Review: The objectives of this review was to evaluate the effectiveness of the road closures (roads 524.03 and 526.I.02) in riparian and wetland areas.

Standards and Guidelines Related to Review Objectives:

- Forest-wide Direction, Water and Aquatic, Standard 4: In the water influence zone next to perennial and intermittent streams, lakes, and wetlands, allow only those actions that maintain or improve long-term stream health and riparian condition (p. 1-28).
- Forest-wide Direction, Infrastructure – Travelways, Guideline 4: Decommission unneeded travelways to achieve resource objectives or where resource damage cannot be mitigated (p. 1-61).
- Management Area (MA) Direction 5.15 – Forest Products Ecological Maintenance (pp. 2-61 to 2-64) Transportation Guideline 1: Close non-essential roads to enhance or develop large areas for wildlife security and non-motorized recreation opportunities.
- The following design feature was also included as part of the decision: Rip, waterbar or use other methods to prevent surface erosion when closing roads.

Observations

Figure 29 shows the wetland crossing before the fill removal. The road fill was changing the function of the stream and the adjacent riparian meadow. Figure 30 displays the wetland crossing after the fill was removed. The crossing was restored to the level of the adjacent riparian meadow. Best Management Practices were used to stabilize the disturbed areas.

Figure 39. Road 524.03 before project implementation.

Figure 40. Road 524.03 after project implementation.

Figure 31 shows Road 526.I.02 wetland crossing after the fill removal and the restoration of the crossing to the elevation and slope of the adjacent riparian meadow. Figure 32 shows the wetland crossing after the fill removal, seeding, and layout of the erosion matting. Using Best Management Practices, this disturbed area has been stabilized.

Figure 41. Road 526.I.02 during project implementation.

Figure 42. Road 526.I.02 during project implementation.

Recommendations

- Continue to monitor existing and future road closures at least once within three years of closure to determine effectiveness. This is a requirement outlined on page 10 of the June 21, 2007 Decision Notice.

Conclusions

Forest Plan standards & guidelines, though not explicitly listed in the Decision Notice for this project, are observed to have been followed in the planning of this project. The standards & guidelines were incorporated into the project design and were implemented on the ground. All roads were evaluated on the ground prior to their closure to determine the most effective closure method and to determine the method that would result in the fewest resource impacts. The standards & guidelines are being implemented to restore the function of riparian areas and to stabilize disturbed areas. Erosion matting and seeding in disturbed areas are two examples of measures being taken to improve long-term stream health and riparian condition, as required by Water and Aquatic Standard 4. The full effectiveness of the standards & guidelines has yet to be determined. It is too early to determine whether or not the work accomplished in the riparian areas will be effective in the long-term. However, short-term indications are that the work accomplished is beginning to regulate riparian function and return it to a more natural state.

Hahns Peak-Bears Ears Ranger District

California Park Area Rangeland Management

The purpose of this project is to manage livestock grazing so that riparian and rangeland vegetative conditions improve, primarily on the California Park cattle allotment. The project involves timing livestock movements based on the utilization of key areas.

Objective of the Review: To evaluate the design criteria developed for an adaptive management approach on the allotment.

Standards and Guidelines Related to Review Objectives:

The following design criteria incorporate the standard for removing livestock when utilization on key areas will exceed the allowable use criteria and the stubble height guideline for grazing riparian areas.

- For years 2007-2009, an average height of six inches on sedge stubble will be left along the key riparian areas along Elkhead Creek and First Creek. When the allowable use is reached, livestock will be moved to another unit or, if this is the last unit in the rotation, moved off of NFS land.
- Adaptive Management Options
    - If three years of monitoring show that cattle continue to congregate in the Lower Elkhead unit when allowable use is reached, and herding is ineffective to prevent cattle from returning to this unit, then a fence (most likely an electric and/or high tensile fence) would be constructed along the western boundary of the State land and continue on either end into the National Forest as early as 2009.
    - If monitoring indicates that maintaining a six inch stubble height is adequate to meet or move toward desired condition, then this management will continue. If monitoring indicates that maintaining a six inch stubble height is not adequate to reach the desired condition and alleviate the associated issues, this stubble height may be increased to eight inches.

Also, the following design criteria incorporate the allowable use guidelines for vegetation in upland range sites.

- Allowable use on upland grass species will not exceed 40% even if the stubble height of sedges is still within allowable use levels.

Forest Plan 4.3, Dispersed Recreation Area (2,193 acres) Range Guidelines –

1. Manage livestock to reduce conflicts with recreation.

2. Do not allow livestock to congregate in heavily used dispersed recreation areas.

Observations

The movement of cattle solely by herding has been marginally effective in preventing them from returning to the Lower Elkhead unit once allowable use has been reached. The data from 2007 was summarized and shows that the six inch residual stubble height on sedges was not exceeded for that year. However, the amount of bank trampling by elk and livestock is affecting the establishment of vegetation on exposed soils and point bars. The schedule of developing and implementing an adaptive management process for meeting resource objectives is on track. The permittee has been willing to participate and has made strong efforts to control livestock movement by hiring a full-time rider.

Recommendations

- Monitor early season elk movement patterns to determine the intensity, frequency, and location of the areas the elk are using.
- Establish a method to measure livestock trailing impacts and bank trampling/alteration and determine appropriate thresholds. Resolve why current levels of trailing and trampling are disproportionate to forage utilization levels.

- Determine what additional methods can be used to influence livestock movements and congregation.
- Implement additional monitoring techniques so that the stubble height standard is sufficient to address riparian and stream stability concerns. Collect reference data for establishing bank trampling thresholds so that resource objectives for livestock grazing and riparian/stream health are met.

Conclusions

Standards & guidelines were incorporated into the decision and into the design criteria. The standards & guidelines are being implemented on the ground. Key areas were identified for monitoring utilization on sedge stubble in riparian areas. The implementation phase of the adaptive management plan is nearing the end of the first phase (2007-2009). The movement of cattle solely by herding has been marginally effective in the Lower Elkhead unit. More conclusions about the effectiveness can be made when the data on sedges in the key riparian areas for 2008 has been summarized. Additional design criteria from the decision may need to be implemented. The establishment of a riparian exclosure and continued monitoring will help determine the next step. The experience gained from this project will be useful in the planning and design of future projects.

Parks Ranger District

Gould Stewardship Fuels

The purpose of this project is to reduce fuel hazards and fire risk in the wildland urban interface. The project consists of thinning along the Forest boundary and adjacent to structures. The treatment includes some tree removal and feathering to natural conditions 500 feet from the Forest boundary. For safety, the Forest Service would burn the slash in a public slash disposal site, which will be open to the community of Gould and to the Colorado State Forest Service. A Supplemental Information Report includes allowing the removal of dead and dying lodgepole pine, or a clear cut of 7" dbh and above, in Units 2 and 8. Due to market conditions, Units 11, 12, and 13 were excluded from treatment.

Objectives of the Review: 1) Determine if the project is consistent with the Gould Fuel Reduction Decision Notice (2002), SIR (2006), Forest Plan Standards & Guidelines, and Forest Service Manuals and Handbooks, and 2) Determine how well the project achieved the desired outcomes.

Standards and Guidelines Related to Review Objectives:

- Manage land treatments to limit the sum of severely burned and detrimentally compacted, eroded, and displaced land to no more than 15% of any land unit (FSH 2509.18) (Forestwide Soil Standard 5 p.1-6).
- Maintain or improve long-term levels of organic matter and nutrients on all lands (Forestwide Soil Standard 6 p. 1-6).
- Manage land treatments to conserve site moisture and to protect long-term stream health from damage by increased run-off (Forestwide Water and Aquatic Standard 2 p. 1-6).
- Manage land treatments to maintain enough organic ground cover in each land unit to prevent harmful increased runoff (Forestwide Water and Aquatic Standard 3 p. 1-6).

- In the water influence zone next to perennial and intermittent streams, lakes, and wetlands, allow only those land treatments that maintain or improve long-term stream health (Forestwide Water and Aquatic Standard 4 p. 1-6).
- Apply runoff controls to disconnect new pollutant sources from surface and ground water (Forestwide Water and Aquatic Standard 11 p. 1-7).
- Manage vegetation in high-use recreation areas to provide for public safety, to improve forest health, and to maintain or improve the desired recreation setting(s) (Forestwide Insects and Disease Guideline 2 p. 1-15).

Mitigation Contained in the Decision:
Amphibian Species

- Survey high potential amphibian habitat prior to project implementation. This is needed to confirm or deny presence of amphibian species.
- If breeding sites are found and it is determined that thinning and prescribed fire operations would negatively affect the site, then operations would cease in that area until specific mitigations can be implemented.
- Restrict pile burning to late fall or early spring when amphibians are inactive.
- If needed, establish a maximum spread rate that would allow amphibians to escape the flames.
- Restrict location or change timing of vehicle use on skid trails and haul routes to reduce mortality of amphibians. This would be based on surveying the project area for amphibians prior to thinning operations.

Entomology

- Pile and burn slash to decrease the chances of a population buildup of pine engraver beetles.

Fire and Fuels

- All opportunities to promote aspen within the treatment areas should be considered.
- Existing and generated activity slash should not be piled larger than 750 Cu. Ft. The public slash disposal site should not exceed 2500 Cu. Ft.

Heritage Resources

- Conduct cultural resource inventories of the treatment units when they are finally established in order to identify cultural properties that may be impacted. Operations managers can then modify treatment activities in order to avoid disturbance and destruction of said properties.
- The possibility of inadvertent discoveries of cultural resources in the treatment areas after a completed cultural resource inventory will warrant a *Discovery and Education Stipulation*. This stipulation will be included in the timber sale contract as a standard operating procedure.

Noxious Weeds

- Monitor areas of treatment for the presence of noxious weeds. If detected, noxious weeds will be treated in accordance with timber sale contract language.

Recreation

- NFSR 741.1 into the Michigan Guard Station should be kept open so that emergency fire vehicles can enter and exit easily.

Silviculture

- Operations will not occur on weekends or holidays.
- Skid trails or temporary roads created for treatments will be closed with natural materials immediately following project implementation.
- Vegetative cover will be established or maintained on disturbed areas (native surface roads, landings, road cutbanks, skid trails, etc.). These actions will be completed in a timely manner following the last disturbance activity and in accordance with timber sale contract language.
- Cutting unit boundaries away from property lines will attempt to minimize visual contrast or appear as straight lines. Changes in stocking levels between stands will be gradual.
- Existing aspen regeneration will be protected during harvest activities. Whole tree yarding will be used on a limited basis.
- The amount, size, and distribution of down logs and replacement snags to remain on treated sites to meet minimum requirements stated in the Revised Land and Resource Management Plan for the Routt National Forest will be identified in the stand prescriptions.
- Live trees with broken tops will be retained for replacement snags.
- The Forest Service reserves the right to close the community slash disposal site if inappropriate materials are being left on site.

Soils

- If burn piles are made with a crawler tractor, use a toothed blade. Limit piles to approximately 300 square feet. After the piles are burned, they will be scarified and reseeded.
- At a distance of greater than 200 feet from the Forest boundary (or a logical landform break) woody debris (greater than 9 inches) will be scattered on-site.
- To minimize soil compaction, heavy equipment will be operated only when soils are dry. If compaction does occur, soils will be sub-soiled (similar to ripping) to mitigate.

Wildlife

- Notify the Parks Ranger District wildlife biologist of all operational changes that affect performance or timing of fuels reduction work, especially where there are planned deviations from the activity characteristics described in the Proposed Action.

- While there may be few to none available, mark for retention all existing hard and soft snags greater than 8 inches dbh, in areas where lodgepole pine is felled. This requirement is exclusive of the first 200 feet of land adjacent to the National Forest boundary, where no snags are to be retained. Should it be determined at the time of logging that a snag would be an obvious hazard to safe operations; the snag should be felled but retained on site as coarse woody debris. In addition, retain live lodgepole pines that have obvious bole or crown defects, whenever possible, in all areas where commercial thins planned.
- Discovery of a goshawk nest in or near any treatment area should lead to immediate cessation of all operations within 750 feet of the nest. Notify a wildlife biologist immediately so that appropriate protections can be determined (giving due consideration for calendar date and type of actions that were underway).
- Should purple lady's slipper be found prior to beginning harvest activities, protect the growing site by placing a 150-foot radius (2 tree lengths) "buffer" around these orchids (or other suitable buffer as identified by the Parks R. D. botanist). If plants are dispersed and not growing in a definable locality, buffer the area with the greatest concentration of purple lady's slipper from being included in the thin. To the extent practicable, and where design discretion permits, maintain the most shade and overhead cover possible over the growing site.
- Contact the Parks Ranger District wildlife biologist for assistance in identifying individual lodgepole pines within aspen groves that would be appropriate to girdle and leave standing.

Observations

The units are clean with good regeneration, and they look like forest parks. The public slash pile has no trash in it and it is neatly piled, though larger than expected. One burn pile was on the edge of the road and under live trees that needed to be protected as regeneration. People are going off-road to get to the public wood pile.

Recommendations

- Ensure burn piles are not too close to roads or live regeneration. The pile burning could kill the live trees if burned in that location.
- Consider putting fencing on either side of gates, like buck and pole from site material, to keep people from going around gates. ATV users driving around gates may be more of a problem in areas where beetle-killed trees have been removed, leaving more open areas. KV funds are down for this type of work. The gate on the 787 Road needs fencing around the gate. Currently, a closed sign is down below. The 787 Road is closed 300 feet from main road, but the gate is ¼ mile up the road.
- Coordinate better on signing for the public slash pile. The public is going off road to get to the public pile since the sign says closed. Put the closed sign further up the road from the public pile so people stay on the road.
- Consider pulling aside top soil before beginning the public slash pile, then re-spreading the top soil after the piling and burning is done. Sometimes it is more cost-effective to rip the sterilized soil after the pile burning and reseed.
- Consider creating places for dispersed campers away from dead trees. When the campgrounds close some people will camp off roads.

- Monitor burning piles more often to keep the fire from spreading. Consider burning piles when about a foot of snow is on the ground to reduce the chance of fire spreading.

Conclusions

This project is consistent with the Gould Fuel Reduction Decision Notice (2002), SIR (2006), Forest Plan Standards & Guidelines, and Forest Service Manuals and Handbooks. This project met the objectives of reducing fuel hazards and fire risk in the wildland urban interface. This project also removed dead and dying lodgepole pine trees in the harvest units. Forest Plan standards & guidelines, as well as mitigation measures are incorporated into the decision and project design. The standards & guidelines have been implemented on the ground and are effective.

Hidden Lake Campground

The purpose of this project is to remove hazard trees to protect public safety. Hot shot crews and crews from the Colorado Department of Corrections cut dead and dying hazard trees in the Hidden Lakes Campground and chipped or piled the coarse woody debris.

Objectives of the Review: 1) Determine if this project is consistent with Forest Service Handbook 1909.15, 31.12(3) Repair and Maintenance of Administrative Sites, as well as Forest Plan Standards & Guidelines and Forest Service Manuals and Handbooks, 2) Determine if soil and water Best Management Practices are being implemented and if they are effective, and 3) Determine how well this action achieved the desired outcomes.

Standards and Guidelines Related to Review Objectives:

- Manage land treatments to limit the sum of severely burned and detrimentally compacted, eroded, and displaced land to no more than 15% of any land unit (FSH 2509.18) (Forestwide Soil Standard 5 p.1-6).
- Maintain or improve long-term levels of organic matter and nutrients on all lands (Forestwide Soil Standard 6 p. 1-6).
- Manage land treatments to conserve site moisture and to protect long-term stream health from damage by increased run-off (Forestwide Water and Aquatic Standard 2 p. 1-6).
- Manage land treatments to maintain enough organic ground cover in each land unit to prevent harmful increased runoff (Forestwide Water and Aquatic Standard 3 p. 1-6).
- In the water influence zone next to perennial and intermittent streams, lakes, and wetlands, allow only those land treatments that maintain or improve long-term stream health (Forestwide Water and Aquatic Standard 4 p. 1-6).
- Apply runoff controls to disconnect new pollutant sources from surface and ground water (Forestwide Water and Aquatic Standard 11 p. 1-7).
- Manage vegetation in high-use recreation areas to provide for public safety, to improve forest health, and to maintain or improve the desired recreation setting(s) (Forestwide Insects and Disease Guideline 2 p. 1-15).

- Use only vegetation management practices necessary to meet specific resource objectives other than wood production. Timber harvest is not scheduled and does not contribute towards the allowable sale quantity (Management Area 4.3: Dispersed Recreation Vegetation Standard 1 p. 2-37).
- Focus on pest management activities and methods on enhancing or protecting recreation opportunities (Management Area 4.3: Dispersed Recreation Integrated Pest Management Guideline 1 p. 2-37).
- Make resource management activities compatible with recreation opportunities. Minimize impacts to other resources (Management Area 4.3: Dispersed Recreation Guideline 2 p. 2-38).
- Locate, develop, and manage recreation sites to protect natural resources (Management Area 4.3: Dispersed Recreation Guideline 3 p. 2-38).

Observations

Dead and dying trees were removed about 100 feet around the campground. Public safety has been improved. Trees left low trunks, and chips cover the ground, which makes the campground look like a forest park. The lake was virtually undisturbed by the tree cutting and chipping, and vegetative screening was often left to buffer the lake from any direct ash or chip carrying runoff. Good regeneration is left in the campground.

Recommendations

- Continue covering the ground within the recreation site with chips. The depth may vary as long as the chips do not cover the vegetation.
- Continue cutting the trees so stumps are as low to the ground as possible.
- Continue removing dead and dying trees within 100 feet around the campsites and roads.
- Continue to protect the good regeneration within the campground.
- Continue piling slash piles far enough from the lake so the ash from pile burning will not drain directly into the lake. Maintaining vegetation buffers between the piles and the lake will filter any runoff.

Conclusions

This project is consistent with Forest Service Handbook 1909.15, 31.12(3) Repair and Maintenance of Administrative Sites, as well as Forest Plan Standards & Guidelines and Forest Service Manuals and Handbooks. Soil and water BMPs are being implemented and are effective. The action achieved the desired outcomes. Forest Plan Standards & Guidelines were incorporated into the project design, are being implemented on the ground, and are effective.

Implementation Monitoring /Scientific and Technical Assistance:

Legally Required 36 CFR 219.12 (k)
Medicine Bow Item Subgoal 3.a & b
Frequency of Measurement: Annual
Reporting Period: Annual

These monitoring items ask the questions:

Implementation Monitoring /Scientific and Technical Assistance: Are the action plans identified in Goal 3 - Scientific and Technical Assistance, being completed on schedule?

Monitoring Protocol/Data Collected

The action plans identified in Goal 3 of the Medicine Bow Plan are given below:

Goal 3 - Scientific and Technical Assistance: Develop and use the best scientific information available to deliver technical and community assistance and to support ecological, economic, and social sustainability.

- **Subgoal 3.a:** Provide better assistance in building the capacity of Tribal governments, rural communities, and private landowners to adapt to economic, environmental, and social change related to natural resources. (USDA Forest Service Strategic Plan 2000 Revision Objective 3.a)

  1. Within 5 years, develop formal cooperation with federal, state, and county agencies, individuals, and non-government organizations for control of noxious weeds, other invasive species, and animal damage.

- This is addressed in the ***Collaboration*** monitoring item above.

  2. Annually, provide opportunities for individuals and organizations to assist the Forest Service in implementing and monitoring the Plan.

     - This is addressed in the *Cooperation* monitoring item above.

  3. Within 10 years, identify, manage, develop, and interpret appropriate watchable wildlife and plant viewing sites.

- This is addressed in the ***Watchable Wildlife*** monitoring item above.

- **Subgoal 3.b:** Improve the knowledge base provided through research, inventory, and monitoring to enhance scientific understanding of ecosystems, including humans, to support decision-making and sustainable management of the Nation's forests and rangelands. (USDA Forest Service Strategic Plan 2000 Revision Objective 3.c)

  Objective:

  1. Over the life of the plan, implement inventory and monitoring systems to provide scientific information and evaluation across landscapes. Inventory habitat and populate databases with information needed to manage terrestrial and aquatic ecosystems.

- This is addressed in the ***Knowledge Base*** monitoring item above.

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District Staff from all of the districts contributed much of the content in addition to photographs for this report.

Photographs are by USFS personnel unless otherwise noted.

Acronyms -

4WD	Four-Wheel Drive
AML	Abandoned mineland
AMP	Allotment managment plan
ATV	All terrain vehicle
ARNF	Arapahoe Roosevelt National Forest
AUM	Animal Unit Months
BA / BE	Biological Assessment, Biological Evaluation
BAER	Burned Area Emergency Response
BBITF	Bark Beetle Information Task Force
BCH	Brush Creek / Hayden Ranger District
BLM	Bureau of Land Management
BMPs	Best Management Practices
CDF	Colorado Division of Forestry
CDI	The Rocky Mountain Region's Center for Design and Interpretation
CDNST	Continental Divide National Scenic Trail
CDOW	Colorado Division of Wildlife
CDTA	Continental Divide Trail Alliance
CIP	Capital Improvement Program
CRCT	Colorado River Cutthroat Trout
CWQCD	Colorado Water Quality Control Division
DM	Decision Memo
DN	Decision Notice
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FACTS	Forest Service Activities Tracting System
FEIS	Final Environmental Impact Statement
FLPMA	Federal Land Management and Policy Act (1976)
FMP	Fire Management Plan
FPO	Forest Protection Officer
FWS	Fish and Wildlife Service
FS	Forest Service
FSH	Forest Service Handbook
FSM	Forest Service Manual
FY	Fiscal Year
GA	Geographic Area
GIS	Geographic Information System
GPRA	Government Performance and Results Act
HM	Head Months
HPBE	Hahns Peak - Bears Ears Ranger District
IDT	Interdisciplinary Team
INFRA	Forest Service Database for Infrastructure
IRA	Inventoried Roadless areas
LAC	(found on page 64)
LE&I	Law Enforcement and Investigations
LEO	Law Enforcement Officer

LRD	Laramie Ranger District
LRMP	Land and Resource Management Plan
MA	Management Area
MAII	May Adversely Impact Individuals
MBR	Medicine Bow – Routt National Forests
MBNF	Medicine Bow National Forest
MBRTB	Medicine Bow – Routt National Forests, Thunder Basin National Grassland
M&E	Monitoring and Evaluation List Colorado)
MIS	Management Indicator Species
MPB	Mountain Pine Beetle
MVUM	Motor Vehicle Use Map
MZW	Mount Zirkel Wilderness
NEPA	National Environmental Policy Act
NF	National Forest
NFIM	National Forest Inventory and Monitoring funds
NFMA	National Forest Management Act
NFPORS	National Fire Plan Operations and Reporting System
NRCS	National Resources Conservation Service
NFRW	National Forest Recreation Wilderness Funds
NFS	National Forest System
NFSR	National Forest System Road
NRIS	National Resource Information System
NVUM	National Visitor Use Monitoring
OHV	Off-Highway Vehicle
PCR	Polymerase Chain Reaction
PFC	Proper Functioning Condition
R2	Region 2 (Rocky Mountain Region of USFS)
RMBO	Rocky Mountain Bird Observatory
RMEF	Rocky Mountain Elk Foundation
RMRS	Rocky Mountain Research Station (USFS)
RNF	Routt National Forest
ROD	Record of Decision
SASEM	Simple Approach Smoke Estimation Model
SB	Spruce Beetles
S&G	Standards and Guidelines
SIA	Special Interest Area
SIO	Scenic Integrity Objective
SLC	Species of Local Concern
SOPA	Schedule of Proposed Actions
SS	Sensitive Species
T&E	Threatened and Endangered Species
TBNG	Thunder Basin National Grassland
TES	Threatened, Endangered and Sensitive Species
TMDL	Total Maximum Daily Load
TRTR	Roads and Trails Funding
TS	Timber Sale
TTFL	Trend Towards Federal Listing
UAA	Use Attainability Analysis
ULT	Ute ladies tresses

USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United State Geologic Service
UW	University of Wyoming
VQO	Visual Quality Objectives
WGCD	Water Quality Control Division (Colorado)
WGFD	Wyoming Game and Fish Department
WUI	Wildland Urban Interface
WYDEQ	Wyoming Department of Environmental Quality
WYNDD	Wyoming Natural Diversity Database

Appendix A

Rare plants associated with late successional and old growth forest habitats

Scientific Name	Common Name	Status	Routt	Medicine Bow
Cypripedium parviflorum	Yellow lady's slipper	SS	Yes	Yes
Rubus arcticus ssp. acaulis	Dwarf raspberry	SS	Yes	Yes
Viola selkirkii	Selkirk's violet	SS	Yes	Yes
Adoxa moschatellina	Moshatel	LC	Yes	
Aralia nudicaulis	Wild sarsaparilla	LC	Yes	Yes
Athyrium filix-femina	Common lady fern	LC	Yes	
Carex concinna	Low northern sedge	LC	Yes	
Cryptogramma stelleri	Fragile rock-brake	LC	Yes	
Cypripedium fasciculatum	Clustered lady slipper	LC	Yes	Yes
Goodyera oblongifolia	Western rattlesnake plantain	LC		Yes
Gymnocarpium dryopteris	Oak fern	LC	Yes	Yes
Listera convallarioides	Broad-leaved twayblade	LC	Yes	
Listera cordata	Heartleaf twayblade	LC	Yes	Yes
Lycopodium annotinum	Stiff club moss	LC	Yes	
Platanthera obtusata	Bluntleaved orchid	LC		Yes
Platanthera stricta	Slender bog orchid	LC		Yes
Polystichum lonchitis	Northern hollyfern	LC	Yes	
Pyrola picta	Whiteveined wintergreen	LC	Yes	Yes
Trillium ovatum	Western trillium	LC	Yes	Yes
Viburnum edule	Squashberry	LC	Yes	Yes
Total			17	13

T = Threatened, SS = Sensitive Species, LC = Species of Local Concern

Rare Plants associated with sagebrush shrublands, meadow and aspen habitat

Scientific Name	Common Name	Status	Routt	MedBow
Botrychium furcatum	Forkedleaf moonwort	SS	Yes	
Botrychium lineare	Narrowleaf moonwort	SS	Yes	Yes
Eriogonum exilifolium	Slender leaved buckwheat	SS	Yes	Yes
Festuca hallii	Hall fescue	SS	Yes	Yes
Ipomopsis aggregata ssp. weberi	Rabbit Ears gilia	SS	Yes	Yes
Machaeranthera coloradoensis var. coloradensis	Colorado tansy aster	SS	Yes	Yes
Penstemon harringtonii	Harrington's beardtongue	SS	Yes	
Triteleia grandiflora	Largeflower triteleia	SS	Yes	Yes
Agoseris lackschewitzii	Mill Creek agoseris	LC	Yes	Yes
Botrychium echo	Reflected moonwort	LC	Yes	
Botrychium hesperium	Western moonwort	LC	Yes	
Botrychium lanceolatum	Lanceleaf grapefern	LC	Yes	Yes
Botrychium lunaria	Common moonwort	LC	Yes	Yes
Botrychium minganense	Mingan moonwort	LC	Yes	
Botrychium pallidum	Pale moonwort	LC	Yes	
Botrychium "redbanks"	Redbank moonwort	LC	Yes	
Carex stenoptila	Riverbank sedge	LC	Yes	
Iliamna crandallii	Crandall's wild hollyhock	LC	Yes	
Iliamna grandiflora	Largeflower wild hollyhock	LC	Yes	Yes
Iliamna rivularis	Streambank wild hollyhock	LC	Yes	
Lesquerella parvula	Pymy bladderpod	LC	Yes	
Lewisia rediviva	Bitteroot	LC	Yes	
Lomatium bicolor var. leptocarpum	Wasatch desert parsley	LC	Yes	
Mentzelia multicaulis var. multicaulis	Manystem blazingstar	LC	Yes	
Mentzelia rusbyi	Rusby's blazingstar	LC	Yes	
Pyrrocoma crocea	Curlyhead goldenweed	LC	Yes	
Penstemon laricifolius var. exilifolius	White larchleaf beardtongue	LC	Yes	Yes
Phacelia alba	White phacelia	LC	Yes	Yes
Phacelia denticulata	Rocky Mountain phacelia	LC	Yes	Yes
Pyrrocoma crocea var. crocea	Western goldenweed	LC	Yes	Yes
Total			29	14

T = Threatened, SS = Sensitive Species, LC = Species of Local Concern

Rare plants associated with wetland and fen habitat

Scientific Name	Common Name	Status	Routt	MedBow
Spiranthes diluvialis[10]	Ute ladies' tresses	T		Yes
Astragalus leptaleus	Park milkvetch	SS	Yes	Yes
Carex diandra	Lesser panicled sedge	SS	Yes	Yes
Carex livida	Livid sedge	SS	Yes	Yes
Drosera rotundifolia	Round leaf sundew	SS	Yes	Yes
Eleocharis elliptica	Boreal spike rush	SS	Yes	Yes
Eriophorum altaicum var. neogaeum	Altai cotton grass	SS	Yes	Yes
Eriophorum gracile	Slender cotton grass	SS	Yes	Yes
Kobresia simpliciuscula	Simple kobresia	SS	Yes	Yes
Mimulus gemmiparus	Rocky Mountain monkey flower	SS		Yes
Salix candida	Hoary willow	SS	Yes	Yes
Salix serissima	Autumn willow	SS	Yes	Yes
Selaginella selaginoides	Northern spike-moss	SS	Yes	Yes
Sphagnum angustifolium	Sphagnum moss	SS	Yes	Yes
Utricularia minor	Lesser bladderpod	SS	Yes	Yes
Alisma gramineum	Narrowleaf water plantain	LC	Yes	Yes
Botrychium multifidum var. *coulteri*	Leathery grapefern	LC	Yes	Yes
Botrychium simplex	Little grapefern	LC	Yes	
Callitriche hermaphroditica	Northern starwort	LC	Yes	
Callitriche heterophylla	Lage water-starwort	LC	Yes	
Carex buxbaumii	Buxbaum's sedge	LC	Yes	Yes
Carex concinna	Low northern sedge	LC	Yes	Yes
Carex hallii	Deer sedge	LC	Yes	
Carex interior	Inland sedge	LC		Yes
Carex lasiocarpa	Woollyfruit sedge	LC	Yes	Yes
Carex leptalea	Bristle-stalk sedge	LC	Yes	Yes
Carex limosa	Mud sedge	LC	Yes	Yes
Carex magellanica var. *irrigua*	Boreal bog Sedge	LC	Yes	Yes
Carex sartwellii var. *sartwellii*	Sartwell's sedge	LC	Yes	Yes
Carex viridula	Little green sedge	LC	Yes	Yes
Comarum palustre	Marsh cinquefoil	LC	Yes	
Eriophorum angustifolium	Tall cottongrass	LC	Yes	Yes

[10] Occurs in sub-irrigated meadows.

Scientific Name	Common Name	Status	Routt	MedBow
Huperzia haleakalae	Fir clubmoss	LC	Yes	Yes
Iliamna rivularis	Streambank wild hollyhock	LC		Yes
Isoetes tennella	Spine-spore quillwort	LC	Yes	
Juncus filiformis	Thread rush	LC	Yes	Yes
Juncus triglumis var. *albescens*	Northern white rush	LC	Yes	Yes
Juncus vaseyi	Vasey's rush	LC	Yes	Yes
Lesquerella parvula	Narrowleaf bladderpod	LC		Yes
Ligularia bigelovii var. hallii	Bigelow's groundsel	LC		Yes
Lilium philadelphicum	Wild lily	LC		Yes
Listera convallarioides	Broad-leaved twayblade	LC	Yes	Yes
Lomatogonium rotatum	Marsh felwort	LC	Yes	Yes
Packera crocata	Saffron groundsel	LC	Yes	Yes
Packera pauciflora	Alpine groundsel	LC	Yes	
Packera pseudaurea var. flavulus	Streambank groundsel	LC		Yes
Petasites sagittatus	Arrow-leaf sweet coltsfoot	LC	Yes	Yes
Potamogeton epihydrus	Rbbonleaf pondweed	LC	Yes	Yes
Potamogeton praelongus	White-stem pondweed	LC	Yes	Yes
Potamogeton robbinsii	Flatleaf pondweed	LC	Yes	Yes
Sagittaria calycina var. *calycina*	Hooded arrowhead	LC	Yes	
Sisyrinchium pallidum	Pale blue-eyed grass	LC	Yes	
Sparganium natans	Small bur-reed	LC	Yes	Yes
Stuckenia filiformis	Fineleaf pondweed	LC		Yes
Stuckenia pectinatus	Fineleaf pondweed	LC		Yes
Triglochin palustre	Marsh arrowgrass	LC	Yes	
Trichophorum pumilum	Rolland bulrush	LC	Yes	Yes
Total			47	46

T = Threatened, SS = Sensitive Species, LC = Species of Local Concern