



MONITORING AND EVALUATION REPORT

FY 2004

**Bighorn National Forest
Region 2**



United States
Department of Agriculture

Forest Service
Sheridan, Wyoming



CERTIFICATION

I have reviewed the Annual Monitoring and Evaluation Report for the Bighorn National Forest for fiscal year 2004. I believe that the monitoring and evaluation requirements of the Forest Plan (Chapter IV) have been met and that decisions made in the Forest Plan are still valid; however, we are less than 1 year from having a Revised Plan. The recommendation in this and previous monitoring and evaluation reports have been used to improve the Revised Plan monitoring and evaluation strategies and effectiveness.

I am especially proud of the work accomplishments reported here. Despite budget constraints and shifting priorities, we, along with our cooperators and volunteers, accomplished a great deal of project work on the ground, where it ultimately counts.

/s/ William T. Bass

William T. Bass
Forest Supervisor

8/19/05

Date

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INTRODUCTION

The Bighorn National Forest Land and Resource Management Plan (Forest Plan) was approved on October 4, 1985. The plan was developed over a five-year period, based on, among other things, a comprehensive public notification and comment process. An Environmental Impact Statement and Record of Decision accompanied the Forest Plan.

The Forest Plan established direction and process so all future decisions would include an interdisciplinary approach to achieve integrated resource management. The Forest Plan provides direction to coordinate multiple uses on the Bighorn National Forest on a sustained basis. The plan also fulfills legislative requirements and addresses local, regional, and national issues. The Forest Plan, Chapter IV requires monitoring and evaluation of management activities to determine the following:

- ◆ How well Forest Plan objectives have been met.
- ◆ Consistency of activities with standards and guidelines contained in the Forest Plan.
- ◆ The need for amendment or revision.

This report is the annual Monitoring and Evaluation Report. It displays the results of monitoring and provides the Forest Supervisor and the public with information on the progress being made toward achieving the goals, objectives, and management requirements in the Forest Plan. It also indicates how well we are fulfilling public demand for goods and services while protecting the Forest resources. An annual Monitoring and Evaluation Report is to be prepared for each existing Forest Plan, including those plans under revision. Funds are provided for the preparation of the report based on information and data collected under agency direction. A target of one report has been assigned to each Forest.

Background

Monitoring is the quality control aspect of forest planning; it requires data collection and observations of activities to periodically evaluate the planning process and the Forest Plan. Evaluation is the analysis and interpretation of monitoring results. It addresses the goals, objectives, long-term relationships, management direction, and significant management activities occurring. There are four aspects to monitoring and evaluation:

- ◆ **Implementation Monitoring** – Forest personnel conduct monitoring as part of their routine assignments and management responsibilities. Their results are documented in project files. Monitoring is performed to determine if management activities are designed and carried out in compliance with forest plan direction and management requirements.
- ◆ **Effectiveness Monitoring** – this type of monitoring determines if management activities are effective in driving the Forest toward the desired future condition described for the various management areas.

- ◆ **Validation Monitoring** – this type of monitoring determines whether the initial data, assumptions, and coefficients used in development of the Forest Plan were correct or if there is a better way to meet goals and objectives and achieve the desired future condition.
- ◆ **Evaluation and Conclusions** – the purpose of evaluation is to interpret monitoring results and reach some conclusions about what the monitoring results really mean with regard to Forest Plan implementation. The interdisciplinary team (I.D Team) may make recommendations and identify research needs as a result of the evaluation process.

Five-Year Monitoring Requirements

Every five years monitoring is to be evaluated to determine if the Forest Plan needs to be revised. FY 2004 is the 19th year of implementation for the Bighorn National Forest Plan. Specific items requiring a revision include:

- ◆ Changes in public demand.
- ◆ Changes in condition of the land or resource used to conduct the analysis, catastrophic events, or monitoring results.
- ◆ National Forest Management Act requirement to update every 15 years.

Planning Activities

Forest Plan Revision

According to the National Forest Land Management Act, the Forest Plan must be revised every 15 years. The first attempt to begin this revision process occurred in the fall of 1997. However, the Interior and Related Agencies Fiscal Year 1998 Appropriations Bill (as amended according to Commerce Bill H.R. 2267) contained language that limited spending for forest plan revision activities. Only those Forests with a formally published “Notice of Intent” (NOI) to prepare an Environmental Impact Statement (EIS) were authorized to proceed with revision. The Bighorn had not published an NOI and consequently, was not funded to revise its plan.

In fiscal year 1999, eleven Forests approaching the 15-year anniversary for approval of their plans were once again funded for revision. The Bighorn was one of these forests. We began to refine our data needs and make necessary arrangements for supporting studies in earnest.

The Notice of Intent (NOI) to revise the Land and Resource Management Plan for the Bighorn National Forest was published in the Federal Register on November 10, 1999. At that time, the Forest Service invited comments on the information contained in the NOI and asked that they be forwarded to us for inclusion in the revision process. The following five major revision topics were proposed in the NOI:

Biological diversity

Special areas.

Timber suitability and management of forested lands

Travel management and dispersed recreation.

Roadless area allocation and management

In early February 2000, funding for revision was significantly reduced due to other planning issues at the national level. These included revising the current Forest Service planning regulations, drafting a national policy on managing our remaining roadless areas, and a proposed new Forest Service roads policy. The result was another delay in the revision process.

In October 2000, funding allowed us to once again undertake forest plan revision. The Draft Revised Plan and Draft Environmental Impact Statement were published and available for public review and comment in July 2004, and revision is scheduled for completion in 2005.

Forest Plan Amendments

The Forest Plan has been amended 15 times since it was approved in 1985. The amendments are summarized below and the changes in management area allocations resulting from the amendments are displayed at the end of these summaries in a table.

Forest Plan Amendment One updated the Ten-Year Timber Sale Summary (Appendix A) – updated through 1990, Arterial and Collector Road Construction and Reconstruction Summary (Appendix B)--updated through 1993, Trail Construction and Reconstruction Summary (Appendix C)--updated through 1993 and Developed Recreation Site Construction/Reconstruction Summary (Appendix H)--updated through 1993.

Forest Plan Amendment Two updated the implementation schedules, including the Ten Year Timber Sale Summary in Appendix A, Trail Construction and Reconstruction Summary in Appendix C, and Developed Recreation Site Construction and Reconstruction Summary in Appendix H. It was necessary to update these schedules annually to reflect changes in planned activities due to such factors as differences between program budgets and actual appropriations, economic considerations, site-specific analysis, and other natural and physical factors.

Forest Plan Amendment Three updated the Ten Year Timber Sale Summary in Appendix A. Schedules are updated as needed to reflect changes in planned activities due to differences between budgets, actual appropriations, economic considerations, site-specific analysis, and other natural and physical factors. The changes in the schedules did not represent a change in management direction.

Forest Plan Amendment Four changed and improved some of the monitoring requirements for wildlife, range, soils, water, riparian, and fish habitat. The Forest Interdisciplinary Team had discovered that some of the procedures and standards did not provide the best means for monitoring.

Forest Plan Amendment Five was issued to change the projected expenditures and returns shown in Forest Plan Table III-1. This change updated the costs for plan implementation.

Forest Plan Amendment Six added the Forest's Recreation Strategy as Appendix J and the designation of three scenic byways as Appendix K. These documents did not change the overall Forest Plan direction, but did clarify the goals and objectives of the recreation program.

Forest Plan Amendment Seven replaced the seven-year regeneration standard with a five-year regeneration standard, which applied to final harvest of lodgepole pine. The amendment added additional Standards and Guidelines to be used in making a determination that regeneration could be assured within five years following final harvest. The amendment also

made corrections to the lands designated as suited for timber harvest, reducing the amount of land suited for timber harvest by about 4,000 acres to 262,062 acres.

Forest Plan Amendment Eight changed the visual quality objectives for the Twin Lakes Reservoir special-use permit area, Sections 34 and 35, Township 54 North, Range 87 West, Sixth Principle Meridian. The visual quality objectives in management areas 4B and 9A were changed from Retention and Partial Retention to Maximum Modification. This change allowed for the expansion of the Twin Lakes Reservoir to proceed and be consistent with Forest Plan direction.

Forest Plan Amendment Nine changed management prescriptions on 83 acres of lands because of the Tie Hack Dam and Reservoir, which is located on the South Fork of Clear Creek. This amendment changes 47 acres of management prescription 4B (wildlife management) and 36 acres of management prescription 7E (timber management) to 83 acres of management prescription 9E (water impoundment).

Forest Plan Amendment Ten changed 22 acres of 6B (livestock grazing) to 1A (Developed Recreation Management – Tie Hack Campground). In addition, the timber suitability on these 22 acres of Management Area 1A changed from suited forestland - timber emphasis (511 timber component) to unsuited forestland - land not appropriate for timber production (825 timber component).

Forest Plan Amendment Eleven changed the management prescriptions on 101 acres of National Forest lands located at the Twin Lakes Dam and Reservoir site located on Coney Creek, Tongue Ranger District. This amendment changes 86 acres of management prescription 4B (wildlife management) and 15 acres of management prescription 9A (riparian management) to 101 acres of management prescription 9E (water impoundment).

Forest Plan Amendment Twelve changed the Standards and Guidelines in the Area of Consultation described in the Medicine Mountain Historic Preservation Plan. The current Forest Plan land allocations within the Area of Consultation will remain the same.

Forest Plan Amendment Thirteen changed 40 acres from 7E and 2B designation to 1A to accommodate the Tie Hack Campground.

Forest Plan Amendment Fourteen changed the Cloud Peak Wilderness Area from four management areas to two, and revised or added 10 Standards and Guidelines for management.

Forest Plan Amendment Fifteen revised the list of Management Indicator Species (MIS) for the Forest from twenty-four to six species. The amendment refined the species being monitored because the Forest could not monitor population trends of 24 species, nor were many of the species reflective of management issues tied to specific habitats. The following six species were designated as MIS: elk, red squirrel, red-breasted nuthatch, white-crowned sparrow, lark sparrow, and three-toed woodpecker. The amendment also included monitoring requirements for MIS and certain TES species.

These fifteen amendments redistributed the management area allocations for 206 acres, which is .019 percent of the total Bighorn Forest (see Table 1 for current allocations).

Table 1. Current management area allocations on the Bighorn National Forest compared with those in the 1985 forest plan.

Management area	Emphasis	Acres Allocated in 1985 Forest Plan	Current Allocated Acres
1-A*	Existing & proposed developed recreation facilities	913	935
1-B	Existing & potential winter sports sites	559	559
2-A	Semi-Primitive Motorized recreation opportunities	42,378	42,378
2-B	Rural & Roaded Natural recreation opportunities	15,220	15,220
3-A	Semi-Primitive Nonmotorized recreation opportunities	44,660	44,660
3-B	Primitive recreation in unroaded areas	45,980	45,980
4-B*	Wildlife habitat management for one or more management indicator species	206,237	206,104
4-D	Aspen stand management	11,171	11,171
5-A	Wildlife winter range in non-forested areas	15,500	15,500
5-B	Wildlife winter range in forested areas	10,153	10,153
6-A	Livestock grazing, improve forage condition	26,494	26,494
6-B	Livestock grazing, maintain forage condition	242,541	242,541
7-E*	Wood fiber production	202,500	202,442
1.11	Pristine wilderness	130,803	130,803
1.13	Wilderness, semi-primitive	61,094	61,094
9-A*	Riparian and aquatic ecosystem management	11,744	11,729
9-B	Increase water yield	4,080	4,080
9-E*	Needed water impoundment sites	0	184
10-A	Research natural areas	1,320	1,320
10-C	Scenic, geologic, historic, and other Special Interest Areas	165	165
10-D	Wild and scenic rivers corridors	30,559	30,559
Total Forest Acres		1,107,670	1,107,670

* Note: Management Area 1A (Recreation Facilities) increased by 22 acres.
Management Area 4B (Wildlife), decreased by 133 acres.
Management Area 7E (Wood Fiber Production) decreased by 58 acres.
Management Area 9A (Riparian) decreased by 15 acres.
Management Area 9E (Water Impoundment) increased by 184 acres.

Forest Plan Projected vs. Actual Outputs

The following table compares projected forest plan average annual outputs, costs, and returns to actual fiscal year (FY) 2004 accomplishments. A direct comparison of projected outputs is not always appropriate due to variables such as allocated budgets.

Table 2. Projected forest plan average annual outputs, costs and returns compared to actual FY 2004 accomplishments.

Activity	Unit of Measure	2001-2010 Avg. Annual Projected Outputs	FY 2004 Outputs
Soils			
Soil and Water Resource Improvements (i.e., improved watershed condition)	Acres	38.5	35
Annual Soil Survey	Acres	Not estimated	Completed
Soil Loss (incremental increase due to timber harvest and road construction)	M tons	9.3	Not estimated
Water			
Water Yield	MAF	699	699
Water Meeting Water Quality Goals	Miles	Not estimated	1,680
Water Not Meeting Water Quality Goals	Miles	Not estimated	20
Minerals			
Leasing Availability Recommendations			0
No Lease	M Acres	211.98	0
Lease	M Acres	723.84	0
Lease Without Surface	M Acres	171.85	0
Minerals Operating Plans	Total Number	5	1
Fire			
Fire Management -Most Efficient Level	Million \$s	1.16	1.762
Fuels Breaks and Natural Fuels (includes prescribed burns)	Acres	300	2,729
Wildlife and Fish			
Wildlife Habitat Improvement	Acres	2,560	2,000
Big Game Winter Range Carrying Capacity			
Elk	Number	527	527
Deer	Number	1,053	1,053
Riparian Area Improvement	Acres Improved Annually		200
Aspen Treatment	Acres	527	25
Changes in Habitat Capability of Indicator Species			~
Early Successional Stage	% change (mean of 8 species)	Not estimated	~

Activity	Unit of Measure	2001-2010 Avg. Annual Projected Outputs	FY 2004 Outputs
Mid Successional State	% change (mean of 8 species)	Not estimated	~
Late Successional Stage	% change (mean of 6 species)	Not estimated	~
Fisheries Improvement Structures	Structures Constructed Annually	60	11
Wildlife Structures	Structures Constructed Annually	15	50
Threatened and/or Endangered Species Habitat Management	Number of Animals	0	2
Range			
Permitted Livestock Grazing	MAUMs	140	122.4
Areas of Grazing, Recreation & Wildlife Conflicts Where Conflict are Reduced	M Acres (Cumulative totals rather than annual outputs)	22	58
Dispersed Recreation			
Number of Trailheads with Access for all Classes of Vehicles (incremental over previous period)	Total number (1978-1998)	Not Estimated	Not Estimated
Trail Construction/reconstruction	Miles	2.9	7
Wilderness			
Wilderness Management	Acres	189,000	189,000
Wilderness Capacity	MRVDs	124	124
Wilderness Use	MRVDs	110	47.5
Lands			
Land Purchase and Acquisition	Acres	Not Estimated	0
Right-of-Way Acquisitions	Total Cases Each Period	0	0
Occupancy Trespass	Cases	4	1
Landline Location	Miles	38	3.5
Facilities			
Road Construction			
Arterials	Miles	1.9	0
Local Roads	Miles	18	0.1
Road Reconstruction			
Arterials	Miles	1.9	0.1
Local Roads	Miles	8	0.0

Achieving Objectives of the Forest Plan

A review of the previous table indicates the variability in accomplishments. Outputs often vary substantially from year to year as funding levels change. The trends in various resource areas over a three- to five-year period are a better reflection of whether the Forest Service is progressing toward accomplishment of its goals and objectives to reach the desired future condition. A more detailed discussion is contained in the narratives for individual resource areas.

The single factor that has the most influence on outputs and program effectiveness is the annual budget. Distribution of funds often reflects national direction and priorities of the administration and Congress. Traditionally, we have been funded at a level significantly below what was projected to implement the forest plan. Moreover, the dollars are usually not adequately distributed to meet the needs for individual program areas.

For the past several years, we have been using a system of project budgeting, often referred to as a "unified budget." Employees plan this budget and execute projects on a Forestwide basis and trade-offs are realized at the beginning of the fiscal year. We have made an effort to "cap" our fixed costs (permanent employees' salaries, vehicles, rent and utilities, etc.,) at 70 percent of the annual budget. The remaining 30 percent of the annual budget is to be used to provide flexibility to fund a seasonal workforce, provide training, purchase equipment, and deal with unplanned events. At present, we have little control at this organizational level in budget planning and distribution.

MONITORING RESULTS

PHYSICAL COMPONENTS

Water

Introduction and Program Summary

The Forest aquatics program encompasses the soil, air, water, aquatic habitat, riparian vegetation, oil and gas, and minerals programs. It provides leadership and support to various other resource groups in maintaining or improving water quality across the Forest. This is typically done through project level implementation by reducing sediment or other pollutants to the hydrologic system in accordance with the Clean Water Act and other state and federal laws. In 2004, the team supported the Piney/Rock/Big Goose Allotment Management Plan revision. Tongue grazing allotment plan revision, and Woodrock timber NEPA projects. During the fire season, the team did not provide any fire suppression efforts, due to personnel constraints.

Forest plan standards and guidelines are usually addressed during project planning, however, during project implementation they may not always be reviewed due to time and personnel limitations. Project monitoring where standards and guidelines and Best Management Practices have been implemented demonstrates that forest plan direction should protect the soil and water resources.

Water quality across the Forest ranges from degraded to pristine, with the overall water quality generally considered to be good. The most common cause of water quality degradation is chronic sediment delivery from roads, stream crossings, and channel scour. Other impacts to water quality come from recreation, livestock grazing, timber sales, and off-road travel. Timber sale and grazing reviews show that when Best Management Practices (BMPs) are properly applied, there is no detectable change in water quality.

During the summer of 2000, the state of Wyoming conducted a review of BMP implementation and effectiveness across the state. One randomly selected timber sale was Caribou. The audit found that streamside management zones were effective in preventing water quality impacts as well as maintaining channel stability.

Monitoring Requirement: Potable water source compliance with state and federal health and sanitation codes to protect public health.

The engineering program on the Forest is responsible for monitoring water quality at developed sites across the Forest. Monitoring includes water sampling of wells at campgrounds and special use areas during the spring and summer months. This is accomplished yearly, and any deviations from water quality standards are addressed immediately and corrected before the water source is used for human consumption.

Monitoring Requirement: Water quality for compliance with state and federal water quality laws.

The North Tongue River was identified as not meeting water quality standards for the indicator bacteria, *E. coli*. As a result, a segment of the river, from Forest Road 171 to an undetermined distance upstream, was listed in the 305(b) Report and 303(d) list for impairment. The Forest's response was to develop an intensive monitoring program. Monitoring consisted of weekly samples to determine geometric mean concentrations of bacteria. Livestock were identified as the source, and samples before livestock could influence the area were taken to provide baseline information. Results of those monitoring effort strongly implicated livestock as the cause for accidents of state water quality standards. Additional monitoring is expected to occur over the next five years in order to evaluate the effects of implementation of the revised Tongue Allotment Management Plan.

Granite Creek is also on the 303(d) list. Some limited monitoring or evaluation was conducted on this stream during 2004 in order to validate the state listing. Monitoring includes single monthly samples to determine when high counts of bacteria might occur. If high levels are identified in any particular month, a more rigorous sampling scheme may be developed. To date, all samples have been below state-designated water quality standards for *E. coli*.

Assessments are characterizations of ecosystems above the project level; they provide information relevant to land management decisions. During 2004, the aquatics group completed a watershed scale inventory of approximately 70 culverts on the southern portion of Forest in the Piney Creek, Rock Creek, and Big and Little Goose Creek watersheds. The inventory consisted of evaluating roads and trails at stream crossings for effects on water quality.

Air Quality

Program Summary

The 189,000-acre Cloud Peak Wilderness is a Class II airshed that is protected under the Clean Air Act. It has beautiful views and outstanding scenery that could be impacted by air pollution. There are few threats to the air quality from local sources, but sources outside the area such as global acid rain depositions and coal bed methane development east of the Forest may pose a larger threat in the future.

In 1995, the Forest installed a camera on the southern end of the Forest (Grouse Mountain) to monitor visibility. The purpose of the camera was to monitor the long-term air resource of the Cloud Peak Wilderness.¹ Two photographs of Mather Peaks were taken daily between the years 1995-2001. These photographs were analyzed to determine whether or not there has been an increase in particulate matter over time.

The Wyoming Department of Environmental Quality/Air Quality Division has since placed an automated air quality monitoring station on Hunter Mesa in coordination with the Forest. This station has replaced the existing visibility camera on Grouse Mountain and will remain operational indefinitely. Pictures from the monitoring station are available at www.wyvisnet.com.

Long-term lake sampling in compliance with the 1992 Bighorn National Forest Air Quality Monitoring Plan continued during 2004. The two Cloud Peak Wilderness lakes, Florence and Emerald, were sampled the required 3 times during the summer. Results from the Rocky Mountain Research Station are on file at the Supervisor's Office in Sheridan, WY.

Monitoring Requirement: Meet air quality standards for prescribed burning implementation

Compliance with federal and state air quality standards was adhered to during prescribed fire projects. Prior to burn events, the Forest Supervisor approves a prescribed fire plan, and a request for burn permit is filed with the Wyoming Department of Environmental Quality – Air Quality office. The request for permit is accompanied by burn data that includes the number of acres to be burned, type of fuels, and a SASEM report, which predicts the amount of particulate matter to be produced and models smoke drift under various weather conditions. Upon approval of the permit, a weather forecast is obtained the day prior to, or the day of, the actual burn for predicted smoke/fire behavior and weather conditions. Monitoring of wind direction and smoke dispersal was performed during the prescribed burn to ensure compliance with air quality regulations.

Minerals

Monitoring Requirement: Compliance with operating plans and consistency with plan

Only one active mine on the Forest maintained an operating plan in 2004. The mine is a kaolinite clay (pascalite) mine in the headwaters of the South Paintrock drainage. The mine is a

¹ <http://www.wyvisnet.com/gallery/CLPE/start.htm>

small operation where hand tools, such as pick and shovel, are used to extract the clay. The operators used a heavy equipment to extract mineral, which is not a part of their operating plan. This activity did not result in any adverse impacts, and for the most part, the operators were in compliance with the terms of their operating plans during 2004 and consistent with the Forest Plan. Powder River District denied a request for strip mining gravel near FR 25 as incompatible with management of the area.

Soils

Program Summary

The primary goal of the program for soil management is to maintain or enhance long-term site productivity. There are five categories of physical soil disturbances that have been found to affect soil productivity. The categories include: compaction, displacement, erosion, puddling, and severely burned. The aquatics program utilizes soils data, from the Forest soil survey, as much as possible so that management activities may be blended with the ecological capabilities and potential of the land.

Monitoring Requirement: Ground-disturbing activities that have the potential to alter soil productivity

Best Management Practices are usually applied at the project level to reduce the impacts of ground disturbing activities. No specific monitoring was applied during 2004 to evaluate soil productivity related to ground-disturbing activities.

Fish and Riparian

Program Summary

Managing habitat for native fish species and non-native demand game fish is a priority on the Forest. Currently, the Bighorn has one subspecies of native cutthroat trout (Yellowstone), a Region 2 sensitive species. Once a native population of cutthroat trout is identified, habitat improvement and recovery efforts will be planned as needed. The aquatics group has been working cooperatively with the Wyoming Game and Fish Department to monitor and inventory habitat and populations for native and non-native demand game fish across the Forest.

Riparian vegetation is a large component of aquatic habitat, as it helps provide streambank stability, stream shading, and organic material in the form of insects and vegetation. The aquatics program manages riparian vegetation in conjunction with the range staff to improve or maintain riparian conditions across the Forest.

The condition of riparian areas across the Forest ranges from degraded to fully functional. The riparian areas most at risk are those located in meadows and grasslands. Timbered riparian areas are generally in good condition and are adequately protected when Best Management Practices (BMPs) are properly applied; however, non-timbered riparian areas are subject to improper grazing by livestock and wildlife. Changes are being made during allotment management plan revisions in the type of grazing system, season of use, riding plans, exclosures, and livestock numbers. These changes are reducing the level of impact on riparian ecosystems.

During 2004, the aquatics program identified potential restoration opportunities in conjunction with the Wyoming Game and Fish Department. Specific drainages that will be given future consideration include the Medicine Lodge Creek and Porcupine Creek watersheds.

Implementation Monitoring

Monitoring Requirement 1: Fish/riparian habitat rating

The aquatics program typically inventories a proportion of stream reaches on the Forest as part of large-scale watershed analyses for NEPA projects. Specific reach level aquatic inventories were not conducted in 2004 because of budget and time constraints. The inventory provides an assessment of the distribution and condition of aquatic habitat, and is integrated into the planning, analysis, and execution of projects and activities on the Forest, such as roads analysis, forest planning, and NEPA.

Assessments are characterizations of ecosystems above the project level that provide information relevant to land management decisions. During 2004, the aquatics group completed watershed scale inventories on the southern portion of Forest. The inventory consisted of evaluating roads and trails at stream crossings for effects on fish habitat and riparian vegetation. The watersheds that were inventoried during the 2004 field season were:

- ◆ Piney Creek
- ◆ Big Goose Creek
- ◆ Little Goose Creek
- ◆ Rock Creek

Monitoring Requirement 2: Fish population trends

During 2004, Wyoming Game and Fish Department, in coordination with the Forest, inventoried populations of fish species, including Yellowstone cutthroat trout, across the Forest. The following locations were inventoried:

- ◆ Lost Lake (Long Park Creek drainage).
- ◆ Shell Creek
- ◆ Lost Twin Lake 1 (lower) (Upper Tensleep drainage)
- ◆ Granite Lake (N. Paint Rock drainage)
- ◆ N. Fork Paint Rock Creek
- ◆ N. Paint Rock Lake
- ◆ Maybelle Lodge Lake
- ◆ Lake Mclain
- ◆ Meadowlark Lake
- ◆ Medicine Lodge Lake (upper)
- ◆ Medicine Lodge Lake (lower)

To monitor fish population trends, a total of eight sites were inventoried during 2004.

Monitoring Requirement 3: Macroinvertebrates

Monitoring and evaluation of macroinvertebrates were not conducted in 2004. Budgetary, time, and logistical constraints were the limiting factors.

Monitoring Requirement 4: Riparian ecosystem trends

During 2004, streams were improved or maintained with construction and maintenance of riparian exclosures, along with implementing changes in riparian grazing strategies. These activities were conducted across the Forest as part of allotment management plan revisions.

Plans for FY2005

The next fiscal year will be challenging for the aquatics program. For example, the Forest will be finalizing the forest plan revision process. The revision will have consumed a large percentage of time during the previous fiscal year, and additional monitoring and evaluation may be possible.

- ◆ Monitoring water quality in the North Tongue River to see if the revised allotment plan reduces bacterial levels.
- ◆ Survey the stream channel stabilization project at the Dead Swede campground.
- ◆ Review Best Management Practices for timber and grazing project level activities.
- ◆ Develop forestwide monitoring network (at least 20 sites in 2005) for assessment of the Revised Forest Plan.

Fire

The highest priority for the fire program is safety—for firefighters and the public. Nationally mandated actions continue to be implemented in the fire program as part of the South Canyon Interagency Review, Thirtymile Hazard Abatement and Cramer Hazard Abatement, as well as, regionally mandated actions as part of the Missionary Ridge Abatement. These actions are all directed to providing a safe working environment for firefighters and are adhered to at all times on the Forest.

Staffing of permanent, semi-permanent, and seasonal fire positions was commensurate with budget which was not adequate to staff at Most Efficient Level (MEL). The Forest staffed at approximately 90% of MEL. The national demand for experienced fire personnel continues to create challenges in hiring and retaining qualified individuals; some positions have been left vacant until qualified candidates can be found. The approved fire organization for 2004 included 7 permanent full time positions, 20 permanent seasonal positions, and 42 seasonal firefighters. These numbers reflect Forest suppression resources and the national resource Wyoming Interagency Hotshot Crew.

October 1, 2004, the Forest Service began implementation of Interagency Fire Program Management Qualification Standards (IFPM) which addresses firefighter safety through establishment of specific qualification standards for 14 key fire management positions. Full implementation will be completed by October 1, 2009. Upgrading of fire positions on the Forest will be in line with IFPM standards.

Radio communication continued to be an issue on the Forest, specifically reliability of the system. Portable repeaters were used in several situations to improve radio communication to long-term project work sites. In an effort to improve the reliability of the radio system, it was converted to Catalyst Radio Control Over Internet Protocol. This system has been in use since July (on the Bighorn and Shoshone) and although there have been some bugs, the overall quality and reliability of the system seems to have improved. There are still some issues and concerns with the system in Cody Interagency Dispatch Center (CDIC) that will require further work. Two satellite phones are currently available in the fire shop to provide communication with suppression forces when radio communications fail. One satellite phone is assigned to each zone. Routine communication between Cody Interagency Dispatch Center and fire crews worked well for initial attack dispatching of units on the Forest, routine crew check-in, and weather broadcasting to field units.

There are currently five Remote Automated Weather Stations (RAWS) on the Forest which all can be accessed via Internet to obtain current weather observations. A national software glitch in the transmitters related to the leap year caused all RAWS to shut down early in 2004. All RAWS had to be field visited and brought back on line.

Table 3. Resource projects supported by fire crews.

Activity	Location(s)	Purpose
Hazard tree removal	Various Forest campgrounds Along roadways and power lines	Removal of hazard trees for public safety
Facilities maintenance	Big Goose Ranger Station Burgess Ranger Station Hunter Ranger Station Porcupine Ranger Station Tyrrell Ranger Station Various locations on Forest	Upgrade/Maintain/ Improve Facilities
Hazard tree removal, fuels mitigation and firewood stocking	Administrative cabins	Protect structures, increase safety, provide firewood

IMPLEMENTATION MONITORING

Monitoring Requirement 1: Meet air quality standards for prescribed burning

See Air Quality section.

Monitoring Requirement 2: Fire control objective

Energy Release Component (ERC) at all RAWS was generally near or slightly below historical Forest averages through most of the 2004 fire season. 1,000-hour fuel moistures at all RAWS were generally near historical Forest averages or slightly above average. Although the Forest was considerably below normal for precipitation, cool temperatures and occasional, well timed light showers kept fire dangers in the moderate to high range throughout most of the season. Fire occurrence was below average with 7 fires burning approximately 10 acres of National Forest System (NFS) land during 2004. All of these fires were caused by lightning. No fires on the

Forest went into extended attack in 2004. Bighorn Fire Crews provided initial attack support on Bighorn Canyon National Recreation Area lands and on adjacent Bureau of Land Management lands.

Table 4. Fire reports – Bighorn National Forest FY 2004 wildfires.

Ownership	Name	Date of Discovery	Size (acres)
Forest Service	Twin Lakes	6/4/04	5
	Steam Shovel	7/13/04	3
	Grandma's Mountain	8/3/04	<1
	Falls Creek	8/22/04	1
	Quartz Creek	8/22/04	<1
	Point of Interest	9/12/04	<1
	Divide	9/12/04	<1

Monitoring Requirement 3: Fuel treatment of activity fuels

There were 2,406 acres treated with prescribed burning, pile burning, and mechanical treatments for fiscal year 2004. This included 1,256 acres in the wildland urban interface and 1,150 non wildland urban interface acres. Treatment projects included prescribed burning, thinning, and hand piling of fuels at Ranger Stations, summer homes, and campgrounds and burning of piles throughout the Forest to reduce the backlog of hand and machine piles. The Forest target for hazardous fuel reduction was 4,049 acres. This target was not met due to untimely precipitation events during the traditional burning months that created conditions too damp to implement burns.

Specifically, fuels reduction (including thinning, hand piling, pile chipping, and burning of hand piles) was conducted near Story, Wyoming and adjacent to cabins in Little Bighorn Canyon, West Tensleep, Paintrock, Porcupine Ranger Station, Burgess Ranger Station, Big Goose Ranger Station and various summer homes located within the Forest boundary. Prescribed fire was used to treat ponderosa pine stands and sagebrush communities to reduce hazardous fuels and improve forage conditions and wildlife habitat conditions (Fire Regimes 1 and 2, Condition Class 2 and 3).

Hazard tree removal is an ongoing project to remove hazard trees in campgrounds, around Ranger Stations, and along various roads. Trees were felled where needed in campgrounds and slash was piled away from roads or improvements and later burned.

Maintenance and improvement of the Burgess Ranger Station firebreak was continued by thinning adjacent timber stands. This is an on-going, annual project for maintenance purposes, due to the new growth and mortality within lodgepole stands. Dead trees, ladder fuels, and thinning in denser areas were the main focus in this area, as well as, in stands adjacent to the burn project.

EFFECTIVENESS MONITORING

Forest Plan direction for fire management is very general. The standards and guidelines provide limited direction for fire management, while the Fire Management Plan has been written to provide specific fire management direction for suppression in the various management areas. Preliminary data and mapping projects continue to be prepared for the Forest Plan revision.

Incident Commanders are required by policy to monitor the effectiveness of planned strategy and tactics. This is being done on all incidents on the Forest.

The National Fire Management Analysis System (NFMAS) and the Fire Management Plan provide the necessary direction to fund the organization and implement direction to meet the forest plan standards.

BIOLOGICAL COMPONENTS

Insects and Disease

In 2004, the Forest and the Forest Health Management Service Center in Rapid City conducted aerial surveys and ground surveys reported in the *2004 Aerial Survey, Bighorn Mountains of Wyoming, Report RCSC-8-05*. Almost 3.5 million acres of forest were surveyed, including the entire Bighorn National Forest and adjacent lands to the east, west, and south. Results from the 2004 survey are summarized below.

2004 AERIAL SURVEY RESULTS

Limber pine mortality accounted for over half the estimated 430,000 recently killed trees in the Bighorn Mountains in 2004. Dead and dying limber pines were detected at elevated levels in every county except Sheridan and were especially common in Washakie County. Limber pine mortality was most pronounced on the outer edges of the western and especially the southern Bighorn Mountains, particularly on private land. Many other areas in Wyoming are also witnessing significant limber pine mortality.

Limber pine mortality is caused by a complex of agents that are virtually impossible to distinguish during aerial survey. White pine blister rust, a foreign disease caused by the fungus *Cronartium ribicola*, has been weakening and killing limber pines across the Bighorn Mountains for years. Infrequent but locally heavy infections of the plant parasite limber pine dwarf mistletoe, *Arceuthobium cyanocarpum*, also weaken and kill trees. In the last 3 - 5 years, however, the mountain pine beetle (MPB), *Dendroctonus ponderosae*, has added an explosively increasing source of limber pine mortality to this complex of agents. Limber pine is an excellent host for MPB, which affords the highest quality food for immature, developing beetles of the three pine species present in the Bighorn Mountains.

The following information in tables 5 and 6 was estimated by the aerial overview detection survey for forest insect and tree disease impacts conducted July and August, 2004.

Table 5. Killed trees and affected acres by county in the Bighorn Mountains of Wyoming.

Attributed Agent	Attributed Impact	Wyoming Counties					Agent Totals *
		Big Horn	Johnson	Natrona	Sheridan	Washakie	
Mountain pine beetle	Trees Killed	3,662	4,294	6	1,626	1,511	11,100
	Acres Affected	780	2,125	6	647	779	4,340
Douglas-fir beetle	Trees Killed	16,567	2,434	29	63	5,141	24,200
	Acres Affected	3,986	590	29	62	1,068	5,740
Spruce beetle	Trees Killed	14,683	2,259	0	3	90	17,000

Attributed Agent	Attributed Impact	Wyoming Counties					Agent Totals *
		Big Horn	Johnson	Natrona	Sheridan	Washakie	
	Acres Affected	4,214	519	0	1	53	4,790
Pine engraver (<i>Ips</i> spp.)	Trees Killed	0	0	0	0	3	3
	Acres Affected	0	0	0	0	3	3
Douglas-fir engraver	Trees Killed	0	0	0	0	25	25
	Acres Affected	0	0	0	0	7	7
Douglas-fir tussock moth	Trees Killed	n.e.	0	0	0	0	n.e.
	Acres Affected	19	0	0	0	0	19
Recent fire	Trees Killed	0	n.e.	0	0	n.e.	n.e.
	Acres Affected	0	2,533	0	0	3,712	6,246
Windthrow - all species	Trees Killed	0	0	0	0	0	n.e.
	Acres Affected	533	0	0	0	0	533
Subalpine fir mortality	Trees Killed	56,967	3,431	5	59,005	251	120,000
	Acres Affected	11,137	891	4	19,318	120	31,500
Limber pine mortality	Trees Killed	35,075	72,770	14,760	0	135,236	258,000
	Acres Affected	6,956	7,350	1,444	0	10,093	25,800
Total Trees Killed *		127,000	85,200	14,800	60,700	142,000	430,000
Total Acres Affected *		27,600	14,000	1,480	20,000	15,800	79,000

* = Totals rounded up to nearest three significant figures

It is important to note that mountain pine beetle populations can increase significantly in size in limber pine and then will readily switch to attacking other, adjacent pines such as ponderosa or lodgepole. This switching often occurs when the local supply of susceptible-sized limber pine has been depleted. In this way, MPB epidemics can arise in limber pine and successfully move into ponderosa or lodgepole pine.

Table 6. Killed trees and affected acres by land ownership classification in the Bighorn Mountains of Wyoming.

Attributed Agent	Attributed Impact	Land Ownership Classification					Agent Totals *
		BLM	USFS	TNC	PVT	STATE	
Mountain pine beetle in lodgepole pine	Trees Killed	100	3,899	102	253	60	4,410
	Acres Affected	66	917	55	98	26	1,160
Mountain pine beetle in ponderosa pine	Trees Killed	1,638	2,259	111	1,797	880	6,690
	Acres Affected	979	848	78	723	547	3,180
Douglas-fir beetle	Trees Killed	6,255	16,068	180	1,331	400	24,200
	Acres Affected	1,746	3,148	89	565	187	5,740
Spruce beetle	Trees Killed	16	16,939	0	80	0	17,000
	Acres Affected	8	4,730	0	50	0	4,790
Pine engraver (<i>Ips</i> spp.)	Trees Killed	1	0	0	2	0	3
	Acres Affected	2	0	0	2	0	3

Attributed Agent	Attributed Impact	Land Ownership Classification					Agent Totals *
		BLM	USFS	TNC	PVT	STATE	
Douglas-fir engraver	Trees Killed	25	0	0	0	0	25
	Acres Affected	7	0	0	0	0	7
Douglas-fir tussock moth	Trees Killed	0	n.e.	0	0	0	n.e.
	Acres Affected	0	19	0	0	0	19
Recent fire	Trees Killed	n.e.	n.e.	0	n.e.	n.e.	n.e.
	Acres Affected	2,526	12	0	3,105	602	6,250
Windthrow - conifers	Trees Killed	n.e.	0	0	n.e.	0	n.e.
	Acres Affected	17	0	0	67	0	84
Windthrow - all species	Trees Killed	n.e.	n.e.	0	n.e.	0	n.e.
	Acres Affected	108	87	0	148	0	344
Windthrow - spruce	Trees Killed	0	n.e.	0	0	0	n.e.
	Acres Affected	0	106	0	0	0	106
Subalpine fir mortality	Trees Killed	276	118,506	0	855	22	120,000
	Acres Affected	120	31,183	0	165	3	31,500
Limber pine mortality	Trees Killed	55,738	21,464	80	167,467	13,092	258,000
	Acres Affected	6,972	4,311	45	12,944	1,572	25,800
Total Trees Killed *		64,000	179,000	473	172,000	14,500	430,000
Total Acres Affected *		12,600	45,400	267	17,900	2,940	79,000

* = Totals rounded up to nearest three significant figures

BLM = USDI Bureau of Land Management; USFS = USDA Forest Service; TNC = The Nature Conservancy, Ten Sleep Preserve; PVT = private land; STATE = Wyoming state lands.

Subalpine fir mortality accounted for just over a quarter of the tree mortality and about 40% of affected acres mapped in the 2004 aerial survey. This mortality occurred mostly in the northern Bighorn Mountains in Bighorn and Sheridan Counties on lands administered by the USDA Forest Service, closely following the distribution of subalpine fir. Most of that cover type is affected.

Subalpine fir mortality is caused by a complex of factors not entirely understood. A major biotic agent in this is the western balsam bark beetle, *Dryocoetes confuses*, whose populations increase during drought and which can also increase within windthrow and move into standing, green trees. Possible additional biotic factors are root disease(s) and other insects, as yet unidentified. High stand densities of this relatively short-lived species may also contribute to the observed mortality, especially during drought years. Because subalpine fir retains its orange-red needles after it dies for longer than other conifer species, the mapped mortality may be cumulative from the last 2 – 4 years.

Recent **Douglas-fir mortality** caused by the Douglas-fir beetle (DFB), *Dendroctonus pseudotsugae*, was mapped in all surveyed counties, but was concentrated in Bighorn County (Table 5) on lands administered by the USDA Forest Service (Table 3). Epidemic-sized populations were evident in most drainages at lower elevations on the west side of the Bighorn

Mountains, especially in and around Shell Canyon extending south to at least Ten Sleep Canyon and also to a lesser extent on the southeast side in Johnson County. Significant DFB epidemics are in progress in many other parts of Wyoming.

Another tree-killing bark beetle, the **spruce beetle** (SB) *Dendroctonus rufipennis*, is at epidemic population size in many areas of Wyoming, including the Bighorn Mountains. Mortality due to SB was mapped in all but Natrona County, with most of the impact coming in Big Horn and Johnson Counties at higher elevations on lands administered by the USDA Forest Service. Significant SB hot spots were identified in the upper reaches of many drainages between Highways 14 and 16 on the west side. Missing from the survey map were some known SB spots on Bald Mountain and along and south of Highway 14 Alt. The visual signature of recent SB activity is among the most difficult of all biotic agents to detect during aerial survey. It is likely that the impact of SB was underestimated during the 2004 survey.

In addition to killing thousands of limber pine, **MPB** populations are at epidemic status in all but Natrona County in the Bighorn Mountains, attacking both ponderosa and lodgepole pines on all ownerships. MPB activity in lodgepole pine is concentrated in the western portion of the Bighorn Mountains in Big Horn and Washakie Counties on lands administered by the USDA Forest Service. MPB activity in ponderosa pine is occurring primarily along the entire eastern front on all ownerships. MPB, like the closely related DFB and SB, is at epidemic status in many locales in Wyoming, including across the Bighorn Mountains.

About 500 acres of **windthrow** was mapped at 12 locations of Big Horn County in 2004, most of it in the upper reaches of Trapper and White Creeks, west of Shell Reservoir. This windthrow is in close proximity to epidemic **SB** populations, which is cause for concern. This concern derives from the well-known habit of SB to infest and increase greatly within windthrow and then to exit and attack and kill nearby standing trees. It is not known when this windthrow occurred. Windthrow can remain viable to host SB for several years.

One spot of defoliation was mapped and attributed to the **Douglas-fir tussock moth**, *Orgyia pseudotsugata*. It is located about one mile due north of Cone Mountain in the upper Big Tepee Creek drainage in Big Horn County on lands administered by the USDA Forest Service. This insect is a major forest pest across much of western North America, characterized by brief yet spectacular population eruptions that result in significant defoliation and tree mortality. It feeds on Douglas-fir and true firs. Because of the notoriety of this insect defoliator, ground checking this observation would be a good idea.

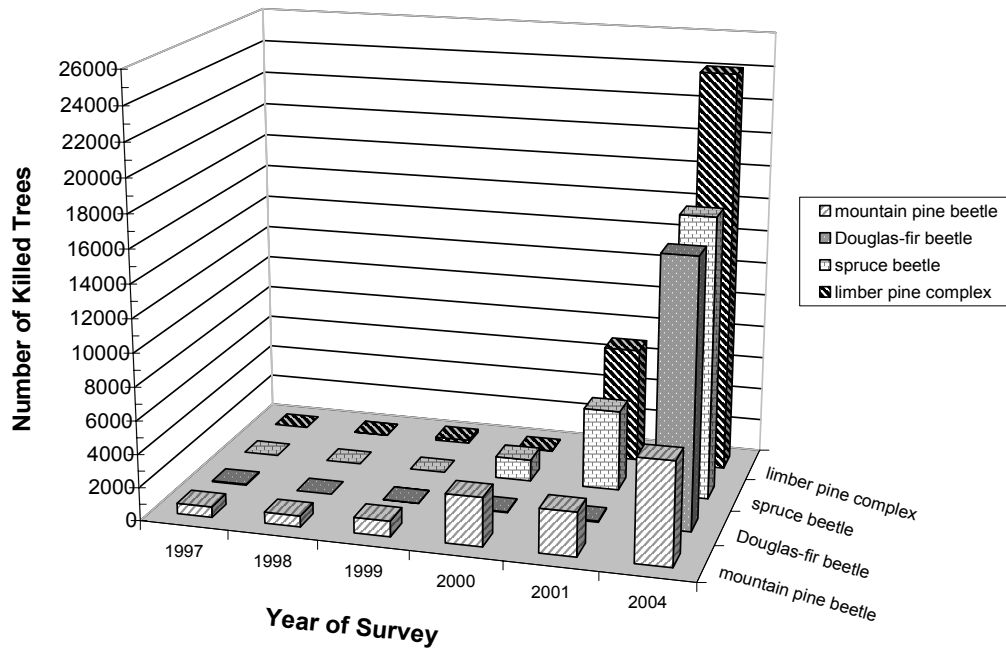
TREND – 2004 RESULTS COMPARED WITH EARLIER SURVEYS

To detect trends, it is important to compare results from surveys conducted over the same or relatively similar flown areas. Overview aerial detection survey results have more than enough sources of error and variation as it is, hence the name “sketch mapping”. In this case, the Bighorn National Forest is the flown area that can reasonably be compared between years.

The last time the entire Bighorn National Forest was surveyed was in 2001. The portion north of Highway 16 was flown in 2000. The eastern slope of the Bighorn National Forest was flown in 1999 and 1998. All but the southwestern corner of the Bighorn National Forest was surveyed in 1997.

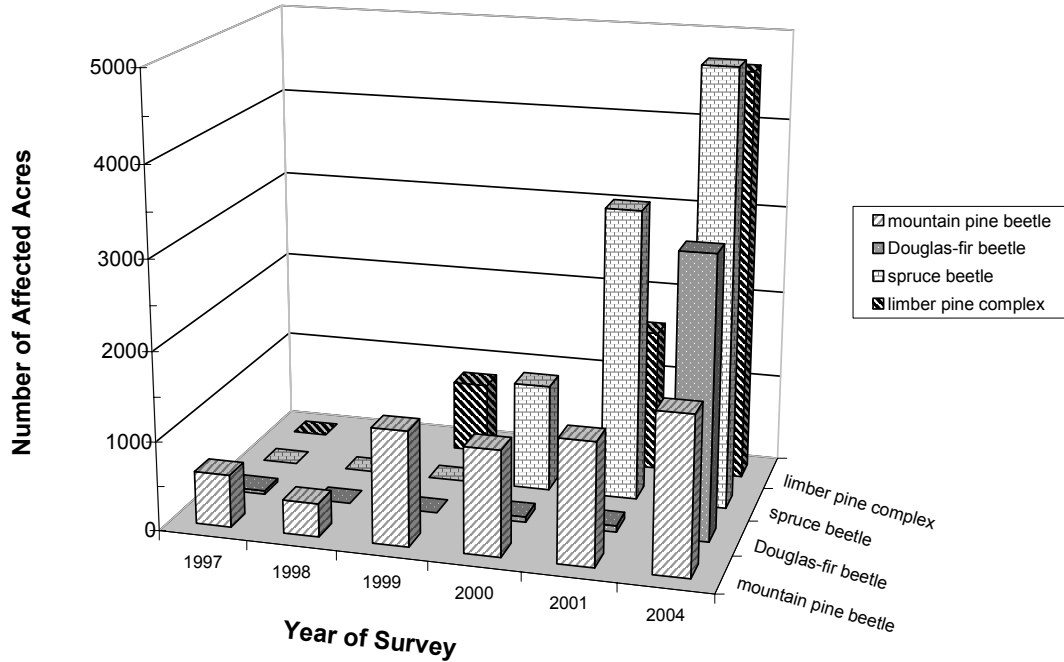
Despite the partial nature of such a data set, Figures 1 and 2 clearly show an increasing trend in killed trees and affected acres for MPB, DFB, SB, and the limber pine complex on the Bighorn National Forest. Very large increases have occurred over the past three years.

Figure 1. Number of killed trees from 1997 to 2004 as estimated by overview aerial detection surveys of portions of the Bighorn National Forest, Wyoming.



A shorter interval between overview aerial detection surveys would have better characterized these large-scale changes. Previously, it was thought that a three year interval between surveys would not cause too much change to be missed. Work on the ground by Rapid City Service Center staff from 2001 - 2004 certainly provided plenty of indication of the mortality increases in the areas visited, but could not constitute a large-scale overview.

Figure 2. Number of affected acres from 1997 to 2004 as estimated by overview aerial detection surveys of portions of the Bighorn National Forest, Wyoming



There is no data for subalpine fir in Figures 1 and 2 because the estimated numbers of killed trees and affected acres for subalpine fir mortality in 2004 are so large on the Bighorn National Forest that the rest of the data is rendered indistinct by including subalpine fir values in the same graph. In addition, problems with estimating subalpine fir mortality already mentioned render annual comparisons somewhat suspect. In 1997, about 8,250 dead subalpine fir trees on 4,000 acres were mapped, as compared with about 119,000 trees on 31,000 acres in 2004 – a huge increase no matter how one qualifies this comparison.

In summary, a dramatic increase in conifer mortality has occurred recently on the Bighorn National Forest. It is likely that adjacent lands have had similar increases, especially in the case of limber pine.

MAPS AND DATA AVAILABILITY

Maps of the 2003 and 2004 aerial survey observations, overlaid onto U.S. Geological Survey 30x60 minute, 1:100,000 scale maps are available on the Internet in PDF format at the following address: <http://www.fs.fed.us/r2/resources/fhm/aerialsurvey>.

GENERAL TRENDS

Ponderosa pine forests continue to see relatively high levels of **mountain pine beetle** (*Dendroctonus ponderosae*) on the eastern edge of the Forest. The Forest is in the fourth year of drought, and that is contributed to near epidemic levels of beetle populations in this timber type. Very limited access to these areas, along with poor wood quality has severely limited any salvage or treatment in this cover type.

Limber pine decline that was reported as far back as 1989 in Tensleep Canyon has progressed to some level into most every limber pine stand on the Forest. Limber pine decline is a combination of mountain pine beetle, white pine blister rust (*Cronartium ribicola*), dwarf mistletoe (*Arceuthobium cyanocarpum*), porcupines, and possibly needle cast diseases. White pine blister rust is an exotic rust that the native limber pine did not evolve with and thus has very limited resistance. It is recommended to continue to collect seed in good seed years for: a) genetic seed banking of a species expecting 90% mortality, and b) to reforest limber pine habitats where and when conditions allow.

Subalpine fir decline has become even more evident on the Forest as discussed above...

The **spruce beetle** (*Dendroctonus rufipennis*) has become very active as discussed above. Some opportunities exist for pre-treatment to increase resistance, but much of the area is inaccessible.

Douglas-fir beetle (*Dendroctonus pseudotsugae*) continues to cause significant mortality along the western edge of the Forest. In Shell Canyon it is now estimated that over 2,000 acres are infected and anticipated to die in the near future and the Forest has a fuels treatment planned in the canyon. Other areas are in remote areas or those designated as “roadless” with limitation on salvage opportunities.

The **lodgepole needlecast fungus** (*Lophodermella montivaga*) continues to be rare, which is attributed to the drought conditions. There have been no known epicenters detected since 1997.

Large areas of **lodgepole pine** with dead tops continue to be observed throughout its range; these areas appear gray from a distance because of the dead and weathered tops. This is caused by **Comandra blister rust** (*Cronartium comandrae*) that kills the tree from the top down. As most of the cones are produced near the top of lodgepole pine, this reduces the amount of seed produced to regenerate these stands.

Large acres of **lodgepole pine** are infected with **Mistletoe** (*Arceuthobium americanum*), and while typically not a direct causal agent of death, it does contribute to reduced overall stand vigor and merchantability.

The **mountain pine beetle** (*Dendroctonus ponderosae*) has moved from the limber pine into the **lodgepole pine** along the western edge of the Forest, most notably in the Cold Springs area.

Gypsy moth trapping on the Forest and by cooperating agencies off-Forest has been ongoing. No moths were trapped in 2004.

Monitoring Requirement: Level of insect and disease organism, compliance with schedule and outputs

The 1985 Forest Plan projected 800,000 acres of insect and disease survey to be done annually. Per agreement with the Forest Health Management Service Center in Rapid City, complete

Forest surveys are scheduled for every three years or more if conditions and funded suggest the need. Surveys were completed in 2004.

Effectiveness Monitoring

Aerial surveys are effective in determining levels of infestation of various pests but are not cost effective annually, unless tracking epidemics.

Forested Vegetation and Timber

Forested vegetation, its condition, management, and the resultant timber commodity outputs are included in this monitoring and evaluation section. The data in this report are from cut-and-sold, PTSAR² and STARS³ reports, and planned accomplished records in the Forest RMACT⁴ database.

Implementation Monitoring

Monitoring Requirement 1: Clearcut harvest unit size

Silvicultural prescription, sale design plans, sale maps, and on-the-ground layout of sales were reviewed for compliance with the maximum size limits; no created openings greater than 40 acres were found.

Monitoring Requirement 2: Assure regeneration within allowable time frames of final harvest

In FY 2004, the Forest surveyed 1,827 acres to determine the status of the regeneration on final harvest units, as defined in 36 CFR 219.27. This year's surveys will be reviewed and certifications made from them in the following winter. Continued monitoring and/or corrective actions are planned for those areas not certified as regenerated. Surveys of past tree plantings indicate generally good success. Harsh site conditions and droughty years have reduced some survival.

Current policy is to have a silvicultural prescription prepared for all vegetation manipulation projects. While great cooperation is now seen with prescribed burning, special uses and habitat improvement projects continue to be implemented without silvicultural prescriptions.

There continues to be no evidence in the activities database of surveys to assure regeneration or certification of past aspen regeneration treatments meeting forest plan stocking requirements.

Qualitative surveys of recent wildfires have shown varied levels of regeneration. Without harvest, there is no legal timeframe to regenerate these wildfires; however, it is good management to monitor their progress and schedule supplemental treatments where necessary. The most recent fires of 2003 have yet to be surveyed, but the West Pass Fire shows very little regeneration, while there are indications that Stockwell and Moncreif have some areas with good

² Periodic Timber Sale Accounting Report (PSTAR)

³ Sale Tracking and Accomplishment Report (STAR)

⁴ Rocky Mountain Activities (RMACT)

regeneration starting. Continued monitoring of these and other recent fires should continue to determine status of regeneration.

Monitoring Requirement 3: Assure reforestation and TSI treatments are current and no backlog is created

Eight hundred and eighty acres of TSI treatments were accomplished in 2004. Some funds taken back to fund the fire season of 2002 were returned, increasing the average acres accomplished. While the reforestation data reflect an accurate assessment of our needs, the needs section for TSI and release will have to be cleaned in order to use this system to accurately calculate the needs.

Currently, we are at 116% of the projected TSI output for the planning period. This is within 25% of the 1985 Forest Plan projections. The monitoring plan recommends that deviation beyond 20% be investigated further.

The reforestation needs report in RMACT shows 1,478 acres needing reforestation (1,467 last year). To continue this progress, the Forest should continue the commitment to the reforestation program.

The RMACT database shows no change in the release needs (2,683) with no treatments or additions. The database shows 6,939 acres of Timber Stand Improvement (TSI) needs, down from 6,920 last year. The difference between the needs shown here and the acres treated indicates a need to clean up this section of the database.

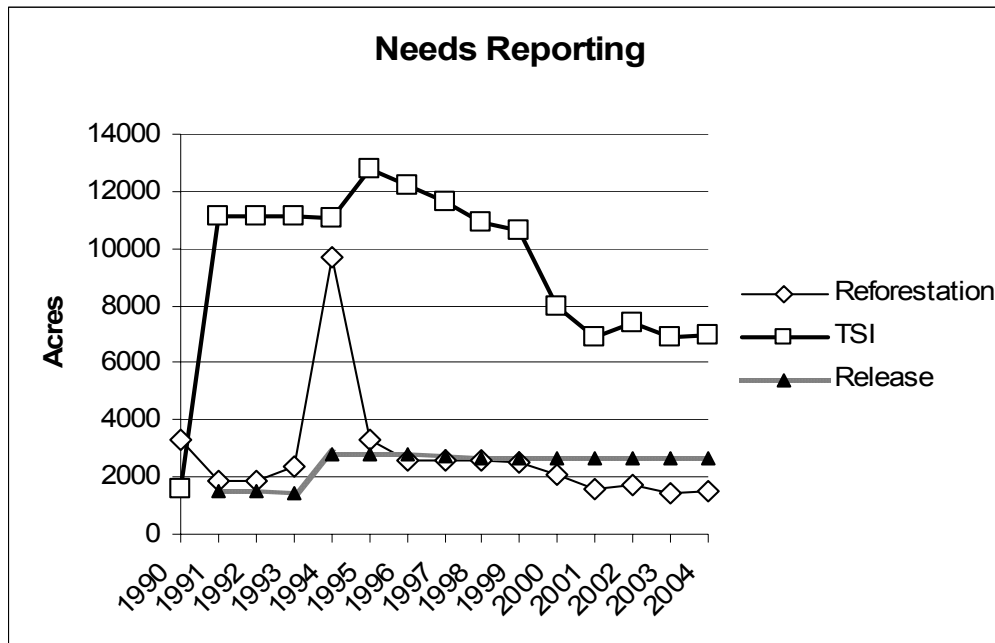


Figure 3. Reforestation, TSI, and release needs since 1990.

Monitoring Requirement 4: Compliance with schedule and outputs

Implementation and interpretation of the 1985 Forest Plan standards and guidelines may have affected outputs. The 1985 Plan did not differentiate between standards and guidelines. This has sometimes resulted in inconsistent application.

The 1985 Forest Plan included a schedule of timber sales and a table of outputs projected over the planning period. The timber sale schedule was updated with forest plan amendments 1, 2, and 3, after which time, it was determined that the schedule was an administrative decision and did not need to be formalized with a plan amendment. The table of outputs for timber includes the volume offered and the acres thinned, reforested, and harvested by regeneration method. The forest plan (Chapter IV - monitoring and evaluation) identifies a need to initiate further evaluation when there is a deviation of 25% over a three-year period in compliance with scheduled outputs (page IV-3).

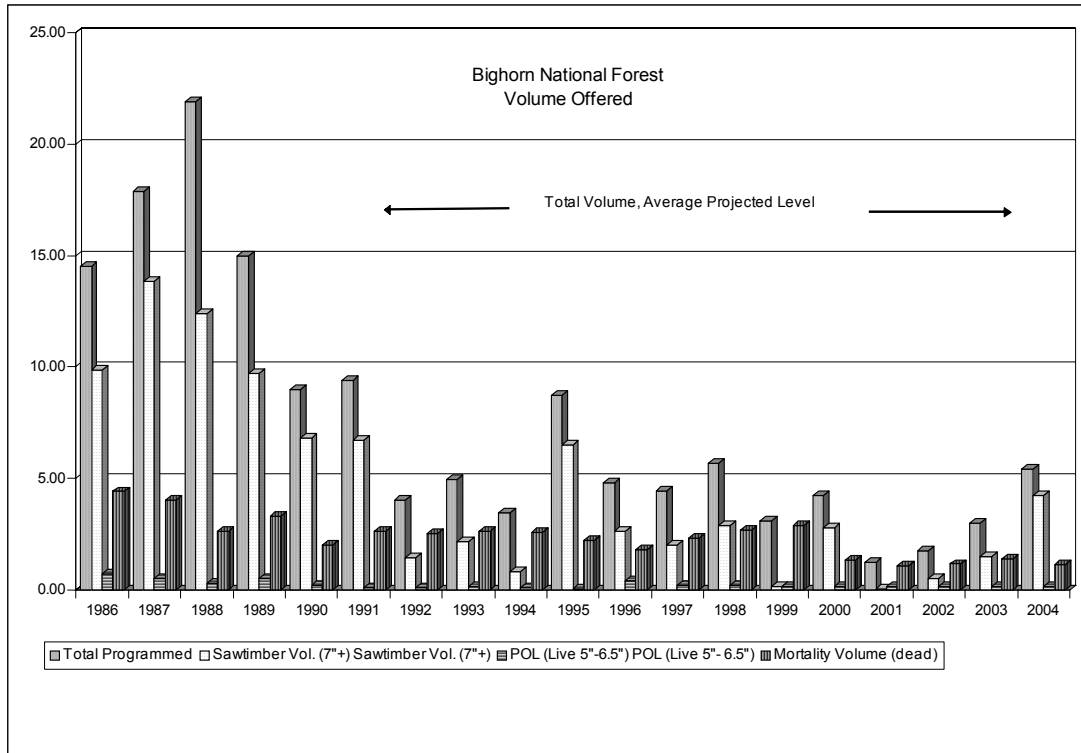
Current commercial timber offerings are below forest plan projections. Through the end of FY 2004, after nineteen years of implementation, the Forest has offered 35.3 million cubic feet, MMCF (142.4 million board feet, MMBF), compared to a projected output of 80.2 MMCF (311.0 MMBF), or 46 percent of the projected ASQ output (45% last year). The acres offered for harvest by regeneration method are also below projected outputs by about 50%.

Given a choice between meeting forest plan standards and guidelines and the outputs projected, the Forest has met or exceeded the standards and guidelines. This has produced lower than projected outputs.

- ◆ Funding levels for many programs are below forest plan projected levels.
- ◆ Appeals and litigation of harvest decisions, or perceived threats thereof.
- ◆ Since 1993, the Forest has been under an administrative timber sale offer cap of between 4.5 to 5.5 MMBF per year. This was the outcome of an ASQ amendment prepared in 1993 but never approved due to concerns over the breadth of the decision. It was determined that the more complete analysis provided in the plan revision scheduled to start a few years later was needed to withstand anticipated appeals.

The following figure shows the difference between the projected allowable sale quantity (ASQ) and our current outputs. Revised projections of timber harvest methods and resultant outputs in wood fiber are included in the ongoing forest plan revision process.

Figure 4. Comparison of projected ASQ and current output on the Bighorn National Forest from 1987 to 2003.

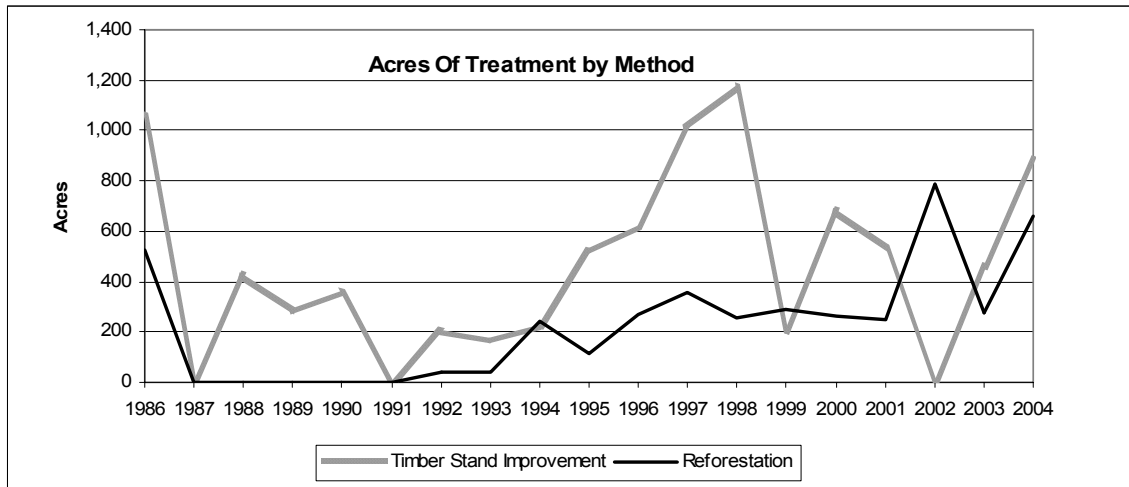


The Ranger Districts have seen demand for fuelwood sales decline as other sources of fuel became more cost efficient. The cumulative removal continues to exceed projections (162%), down from last year.

Post and pole harvest remains stable, with healthy demand exceeding the Forests ability to offer. Teepee poles continue to be in high demand.

The 1985 Forest Plan failed to identify whether direction was a standard or a guideline. This has sometimes resulted in inconsistent application and, in some cases, more or less stringent application than was intended in the plan.

Figure 5. Reforestation and timber stand improvement acres on the Bighorn National Forest from 1986 to 2004.



The Forest completed 133 acres of tree planting (see figure above). Over the planning period, the Forest accomplished 69% of the projected amount of reforestation.

According to the Forest database, no regeneration cutting of aspen was accomplished in 2004. The forest plan objective was to treat 85 acres of aspen annually, but to date the records show only 26% of that projected output has been met. Some aspen treatment and monitoring is reported in the wildlife section of this report.

Monitoring Requirement 5: Status of lands not suited for timber production

The status of lands not suited for timber production is scheduled for re-evaluation every tenth year in the Forest monitoring plan. The last analysis was completed in 1991 with forest plan amendment number seven. The plan lists the “Variability which would Initiate Further Evaluation” as “Data indicates unsuitable lands may be suited”. Monitoring has identified some areas recorded as unsuitable that may be suited, most notable the lower elevation Fool Creek #1 clearcuts, and the lower elevation clearcuts of the Ghastly timber sale, and Douglas-fir sites on north and east aspects. These areas have been noted, and will be included in the suitability analysis underway are part of the forest plan revision process that is projected to be completed in 2005.

Effectiveness Monitoring

No effectiveness monitoring was conducted in FY2004.

Validation Monitoring

The acres of treatment by method from the Forest Plan are displayed in the following figure and table. Since the plan was implemented, the Forest has not matched this projected mix, or the projected wood fiber outputs. Total acres harvested are 38% of the total projected for the planning period, while reforestation acres are 69% of the projected output, and Sawtimber harvest is 30% of projected output. It appears that although the total amount of acres and outputs

are less than ½ the projected amounts, the ratio of acres and volume are consistent. During the forest plan revision process, a concerted effort has been made to validate the scheduled outputs, and the mix of each of these treatment methods.

The Bighorn National Forest management area designations have been found to be too small in size and too numerous in a given watershed to manage for a dominant use on a watershed scale. Watersheds currently do not have a dominant use, or management emphasis, but rather the management emphasis areas are averaged together. This averaging results in management for the average rather than managing for any particular emphasis area. This affects the ability to meet forest plan objectives, outcomes, and outputs. The DEIS for the Forest Plan Revision included larger management areas.

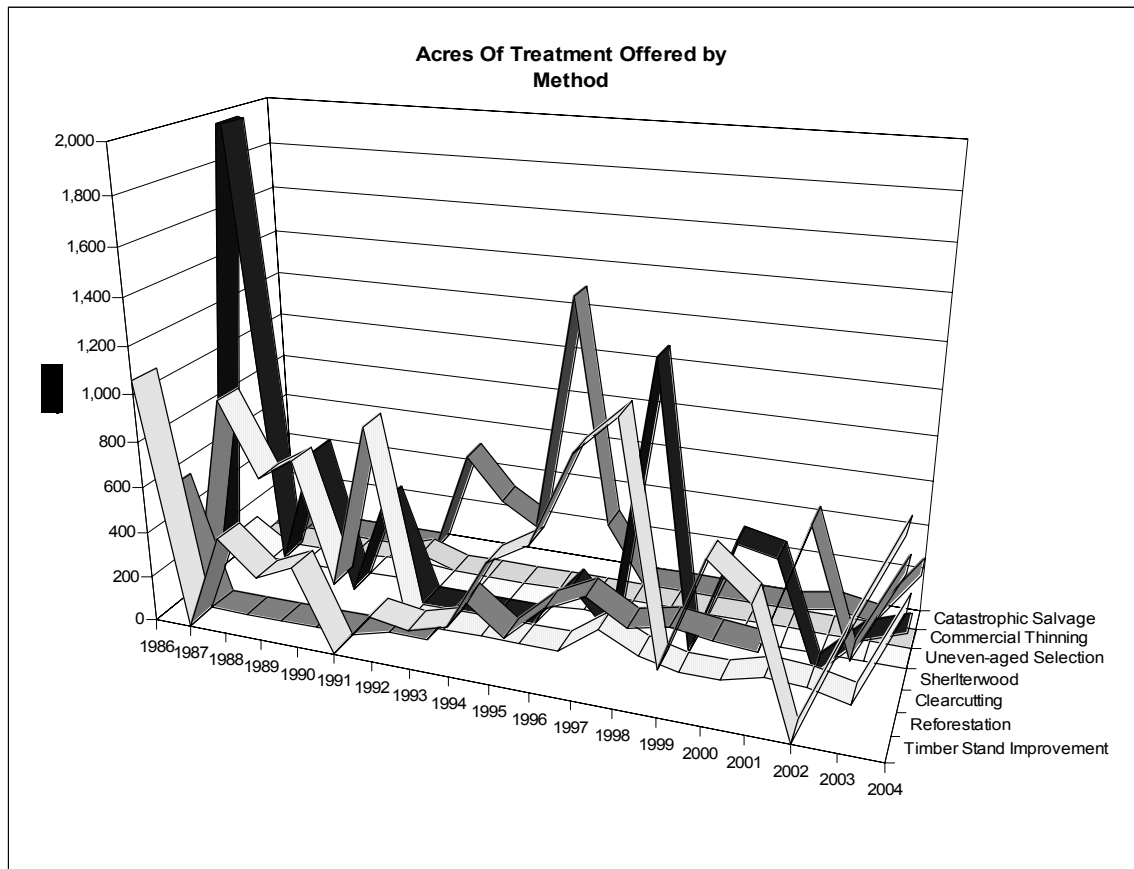


Figure 6. Treated acres, by method, on the Bighorn National Forest from 1986 – 2004.

Table 7. Review of activity and outputs.

Activity	Total Programmed	Sale Volume Offered	Sawtimber Vol. (7"+)	Sawtimber Vol. (7"+)	POL (Live 5"-6.5")	POL (Live 5"-6.5")	Mortality Volume (dead)	Mortality Volume (dead)
Unit of Measure	MMBF	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF	MMCF
2001-2010 Average Projected Output	16.5	4.30	14.50	3.80	0.60	0.10	1.40	0.37
1986	14.50	3.30	9.85	2.58	0.70	0.11	4.40	1.16

Activity	Total Programmed	Sale Volume Offered	Sawtimber Vol. (7"+)	Sawtimber Vol. (7"+)	POL (Live 5"-6.5")	POL (Live 5"-6.5")	Mortality Volume (dead)	Mortality Volume (dead)
Unit of Measure	MMBF	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF	MMCF
1987	17.90	4.70	13.86	3.63	0.50	0.08	4.00	1.06
1988	21.90	5.80	12.39	3.25	0.30	0.05	2.60	0.69
1989	15.00	4.00	9.72	2.55	0.50	0.08	3.30	0.87
1990	9.00	2.30	6.80	1.78	0.20	0.03	2.00	0.53
1991	9.40	2.50	6.72	1.76	0.10	0.02	2.60	0.69
1992	4.00	1.00	1.40	0.37	0.10	0.02	2.50	0.66
1993	4.94	1.17	2.16	0.57	0.13	0.02	2.59	0.68
1994	3.45	0.87	0.82	0.19	0.05	0.01	2.58	0.68
1995	8.74	2.17	6.48	1.57	0.04	0.01	2.22	0.59
1996	4.79	1.11	2.62	0.56	0.38	0.10	1.79	0.45
1997	4.43	1.03	1.97	0.41	0.16	0.04	2.30	0.58
1998	5.67	1.15	2.85	0.63	0.16	0.04	2.66	0.48
1999	3.10	0.75	0.11	0.03	0.13	0.02	2.86	0.70
2000	4.23	0.84	2.76	0.57	0.15	0.02	1.32	0.24
2001	1.21	0.38	0.03	0.07	0.13	0.03	1.06	0.28
2002	1.76	0.42	0.50	0.11	0.12	0.03	1.14	0.28
2003	2.96	0.66	1.49	0.30	0.11	0.03	1.36	0.33
2004	5.42	1.10	4.19	0.85	0.14	0.04	1.09	0.22
Total Projected Output	311.0	80.2	275.5	72.2	9.4	1.5	26.1	6.9
Total Actual Output	142.4	35.3	86.7	21.8	4.1	0.8	44.4	11.2
% of Projected Output	44%	31%	30%	44%	52%	170%	162%	44%

Table 7, cont.

Activity	Timber Stand Improvement	Refor-estation	Clear-cutting	Shelter-wood	Uneven-aged Selection	Comm-ercial Thinning	Catas-trophic Salvage	Other	Total of Area Cut
Unit of Measure	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
2001-2010 Average Projected Output	400	300	1,006	696	89	0	0	0	1,791
1986	1,060	525	22	52	106	0	0	0	180
1987	0	0	881	2,159	0	0	0	0	3,040
1988	426	0	555	108	0	0	0	0	663
1989	280	0	657	629	0	0	0	0	1,286
1990	357	0	118	10	13	0	0	0	141
1991	0	0	852	458	17	54	0	0	1,381

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Activity	Timber Stand Improvement	Reforestation	Clear-cutting	Shelter-wood	Uneven-aged Selection	Commercial Thinning	Catastrophic Salvage	Other	Total of Area Cut
Unit of Measure	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
1992	200	40	0	0	0	0	486	0	486
1993	170	40	0	0	0	0	297	0	297
1994	220	242	0	0	0	0	198	0	198
1995	519	113	0	0	0	0	1,282	0	1,282
1996	622	272	0	202	15	0	256	84	557
1997	1,009	355	124	14	0	0	0	0	138
1998	1,169	255	43	1,227	0	0	0	10	1,280
1999	201	290	0	0	0	0	0	0	0
2000	678	264	0	507	0	0	0	0	507
2001	534	248	50	470	0	0	0	0	520
2002	0	790	38	0	0	0	30	0	68
2003	460	252	0	180	0	0	0	12	192
2004	880	658	417	249	0	0	249	11	926
Total Projected Output	7,600	6,350	20,789	12,034	1,951	none	none	none	34,774
Total Actual Output	8,785	4,371	3,757	6,265	151	54	2,798	118	13,143
% of Projected Output	116%	69%	18%	52%	8%	n/a	n/a	n/a	38%

Range

Program Summary

The following table summarizes the livestock grazing and invasive species monitoring results for 2004. Note that this information is based on a 2004 iteration of the monitoring report to be included in the revised BNF Land and Resource Management Plan. Some data in this report is incomplete. Changes are anticipated between this format and the format in the Revised Forest Plan.

Table 8. 2004 monitoring results for rangeland, livestock, and invasive species.

Monitoring Item		PRRD	MWPR	Tongue	Forest total
1.	AUMs Permitted Cattle	29,936	35,954	21,247	87,137
	AUMs Permitted Sheep	3,451	6,084	1,271	10,806
	AUMs Permitted Horses	233	570	229	1,032
	AUMs Authorized Cattle	25,482	31,849		57,331
	AUMs Authorized Sheep	2,793	3,644		6,437
	AUMs Authorized Horses	289	488		777

Monitoring Item		PRRD	MWPR	Tongue	Forest total
2.	Acres of suitable rangeland grazed in active and vacant allotments	77,010	142,832	81,980	301,822
3.	Acres suitable rangeland in active allotments monitored for compliance with Annual Operating Instructions this FY	52,764	67,254	45,022	165,040
4.	Acres in active allotments meeting standards & guidelines (estimated)	Data not available	Data not available	Data not available	Data not available

Monitoring Item		PRRD			MWPR			Tongue			Forest total		
5.	Number of sites monitored Stubble Height/met standards/percent	12	5	42%	26	22	85%	54	46	85%	92	73	79%
	Number of sites monitored Ocular/met standards/percent	24	15	63%	39	30	76%				63	45	71%
	Number of sites monitored Robel Pole/met standards/percent												
	Number of sites monitored Clipped Plot/met standards/percent							28	17	61%	28	17	61%
	Number of sites monitored Height-weight/met standards/percent												
	Number of sites monitored other protocol 1/met standards/percent												
	Number of sites monitored other protocol 2/met standards/percent												
	Number of sites monitored other protocol 3/met standards/percent												

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Monitoring Item		PRRD		MWPR		Tongue		Forest Total	
		Est.	Verified	Est.	Verified	Est.	Verified	Est.	Verified
6.	Acres meeting desired condition	14,715		6,000	0	26,605		47,320	incomplete
	Acres moving toward desired condition	5,439		45,038	0	17,786		68,263	incomplete
	Acres not meeting or moving toward desired condition			17,840	150			17,840	incomplete
	Acres undetermined			0	73,804			0	incomplete
7.	Acres riparian meeting desired condition	2,842		250	0	1,775		4,867	incomplete
	Acres riparian moving toward desired condition	385		2,543	0	3,876		6,804	incomplete
	Acres riparian not meeting or moving toward desired condition			2,432	100			2,432	incomplete
	Acres riparian undetermined			0	15,670			0	incomplete
8.	Narrative describing information sharing and cooperation	Described below							
Monitoring Item		PRRD		MWPR		Tongue		Forest Total	
9.	Livestock-wildlife sites monitored/sites where use was unacceptable	2	2	1	0	16	6	19	8
	Narrative describing wildlife-livestock conflict over herbivory	Described below							
Monitoring Item		PRRD		MWPR		Tongue		Forest Total	
10.	Acres of noxious weeds known to occur	3600				257		incomplete	
11.	Acres of noxious weeds treated this year	371		186		50		607	
	Narrative describing noxious weed prevention activities	Described below							

MONITORING ITEM 8: INFORMATION SHARING AND COOPERATION

The **Powder River Ranger District** range staff met with permittees and Colorado State University extension specialist, Roy Roath, several times during the 2004 grazing season to discuss resource management planning. When resource concerns arose, permittees and F.S. staff met on the ground to monitor and discuss concerns and ways to mitigate and improve resource issues.

Out of these 54 transects completed by **Tongue District** staff, 23 were either taken with the permittee or contractor present or were later discussed at the site with the permittee. In summary, 43% of the Tongue District's stubble height transects had direct permittee involvement. Of the 28 utilization cages clipped, permittees were present and assisted with 22, representing 79%. Results of the remaining six cages were discussed with the permittee on site following the clipping. District employees met with permittees at least once and in many cases multiple times on the ground in 62% of the active allotments.

The **Medicine Wheel-Paintrock Ranger District** met with 17 permittees on the ground to discuss range readiness, utilization, range improvements, and/or general management of their respective allotments in FY 2004. In cases where the range cons inspected an allotment by themselves, the results were discussed with the permittees over the phone, or in the case of resource concerns they met on the ground. The district is also involved in one active CRM on the Forest with Hamilton Ranch. They also are involved at a very minor level with the Yellowtail Area Weed Management CRM in the Bighorn Basin. Wyoming Game and Fish Department personnel are actively involved with District issues and participate in prescribed burn planning annually. They also involve the FS in wildlife issues as they occur

The Bighorn National Forest range staff was involved in the establishment of the first Wyoming Range 101 School that informed land managers and personnel in the science of range management. F.S. staff attended training sessions on the Robel Pole monitoring methods established by Dan Uresk, (Forest Service Research) to better understand the method and how it can be applied on the ground.

MONITORING ITEM 9: WILDLIFE-LIVESTOCK CONFLICT OVER HERBIVORY

The **Powder River Ranger District** Range staff worked with Wyoming Game and Fish Biologist, Dan Thiele, in monitoring the two willow browse plots.

Tongue Ranger District: Combined wildlife and livestock utilization on willow leaders varies depending on the location and the time of year. Our heaviest use occurred in the South Tongue area and along Copper Creek. Wildlife use from July 2003 to July 2004 was 86 and 79% respectively. However wildlife use along the North Tongue during that same time period ranged from 10 to 44%. Overall, use on willows and aspen by wildlife and livestock are not acceptable and in the long-term will be detrimental to the individual plants and these plant communities. Forage utilization by livestock on grasses in some riparian and upland areas is not acceptable. Any additional use in these areas by wildlife only magnifies the problem; however wildlife use is not the primary cause. No areas on the district have been identified as having over-use on forbs or grass either in riparian or upland areas due strictly to wildlife use.

Medicine Wheel-Paintrock Ranger District: Overall, the combined browsing by wildlife and livestock on willows and aspen in most areas is not acceptable, and in the long-term will be detrimental to the individual plants and these plant communities. Monitoring of some aspen sites over the last several years is showing a loss of some stands even with protection through fencing. This may be a result of the loss of the reproductive ability of the stands due to extensive browsing over many years. It also appears that in years when the snow line is high and snow pack is low, that the browse impacts by wildlife on some aspen stands is less because they are in the upper elevations quicker, so the combined use is less.

The combined utilization of livestock and wildlife on some riparian and upland areas exceeds the total of 40-50% total use allowable. These areas are commonly small in size (less than 40 acres) in comparison to the entire pasture. Permittees are aware of the conflict where this occurs annually in the same areas, and have worked to try and keep livestock from concentrating there. Monitoring in some instances has shown heavy use by wildlife prior to livestock even entering a pasture. The Wyoming Game and Fish Department has helped with annual monitoring and will continue to assist where needed

MONITORING ITEM 11: NOXIOUS WEED PREVENTION ACTIVITIES

Forestwide: Forest staff presented an educational program to all seasonal employees at the annual seasonal orientation. Training information was also provided to all members of the BNF road crew. The increased awareness level of noxious weed identification and spread has led to identification of numerous new populations of weeds. We continue to implement the noxious weed seed free feed program through education and compliance checks. Noxious weed prevention and control is considered in all timber sales, grazing AMPs, and other ground disturbing activities that are being planned through interdisciplinary team approaches in NEPA documents. Note that while only 186 acres of noxious weeds were treated on the MWPR District in year 2004, a much larger amount of land was protected from noxious weed invasion as a result of the treatments.

MONITORING ITEM 10 “ACRES OF NOXIOUS WEEDS KNOWN TO OCCUR, AND MONITORING ITEM 11 “ACRES OF NOXIOUS WEEDS TREATED THIS YEAR ”

Noxious Weed Species by priority for treatment	PRRD		MWPR		Tongue		Forest Total	
	Acres of weeds	Acres treated	Acres of weeds	Acres treated	Acres of weeds	Acres treated	Acres of weeds	Acres treated
Leafy spurge (<i>Euphorbia esula</i> L.)	2.1	2.1			2		4.1	2.1
Yellow toadflax (<i>Linaria vulgaris</i> L.)	4.1	4.1			Trace		4	4.1
Ox-eye daisy (<i>Chrysanthemum leucanthemum</i> L.)	9.45	9.45			2		11.45	9.45
Russian knapweed (<i>Centaurea repens</i> L.)	.1	.1					0.1	0.1

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Noxious Weed Species by priority for treatment	PRRD		MWPR		Tongue		Forest Total	
	Acres of weeds	Acres treated	Acres of weeds	Acres treated	Acres of weeds	Acres treated	Acres of weeds	Acres treated
Hoary cress (whitetop) (<i>Cardaria draba</i> and <i>Cardaria pubescens</i> (L.) Desv.)	.6	.6	2.05	2.05			2.65	2.65
Spotted knapweed (<i>Centaurea maculosa</i> Lam.)	.4	.4	2.00	2.00	7		9.4	2.4
Musk thistle (<i>Carduus nutans</i> L.)			0.60	0.60			0.6	0.6
Houndstongue (<i>Cynoglossum officinale</i> L.)			46.2	46.2			46.2	46.2
Canada thistle (<i>Cirsium arvense</i> L.)			121.7	121.7			121.7	121.7
Common burdock (<i>Arctium minus</i> (Hill) Bernh.)			0.09	0.09			0.09	0.09
Perennial sowthistle (<i>Sonchus arvensis</i>)			1.07	1.07			1.07	1.07
Bull thistle (<i>Cirsium vulgare</i>)			0.61	0.61			0.61	0.61
Common Mullein (<i>Verbascum thapsus</i>)			3.74	3.74			3.74	3.74
Common Tansy (<i>Tanacetum vulgare</i>)			0.49	0.49			0.49	0.49
Field bindweed (<i>Convolvulus officinale</i>)			1.02	1.02			1.02	1.02
Dalmatian toadflax (<i>Linaria dalmatica</i> (L.) Mill.)							0	0
Diffuse knapweed (<i>Centaurea diffusa</i> Lam.)							0	0
Yellow Starthistle (<i>Centaurea solstitialis</i>)							0	0
Scotch thistle (<i>Onopordum acanthium</i> L.)							0	0
Russian olive (<i>Elaeagnus angustifolia</i>)			0.66	0.66			0.66	0.66
Showy milkweed (<i>Asclepias speciosa</i>)			0.95	0.95			0.95	0.95
Plumeless thistle (<i>Carduus acanthoides</i> L.)							0	0
Wild carrot (<i>Daucus carota</i>)			3.54	3.54			3.54	3.54

Noxious Weed Species by priority for treatment	PRRD		MWPR		Tongue		Forest Total	
	Acres of weeds	Acres treated	Acres of weeds	Acres treated	Acres of weeds	Acres treated	Acres of weeds	Acres treated
Wild licorice (<i>Glycyrrhiza lepidota</i>)			0.48	0.48			0.48	0.48
Saltcedar (<i>Tamarix ramosissima</i>)							0	0
Totals	16.75	16.75	4.02	4.02	7	0	212.85	201.95
Number of biological release sites		0		0 in 2004		0		

RARE PLANTS

To facilitate field inventory and identification by other resource specialists, a Rare Plant Field Guide was developed during FY2004. This was distributed to all districts and many resource personnel. In addition, to facilitate program development and tracking, a 5 Year Action Strategy was developed, and incorporated into the Wildlife, Fish, and Rare Plants program 5 Year Action Plan. These efforts, while costing significant time, were exemplary within the Region for bolstering the rare plant program on the Forest. The program is organized with a part-time, forestwide botany contact, Greg Karow (forester), and one seasonal position for inventory. District range specialists also conduct additional inventory and perform project specific analysis for Biological Evaluations.

A one-person crew inventoried approximately 104,000 acres of project areas, including Bald Mountain Salvage, Battle Park AMP, Bench Restoration Project, Hunt Mountain AMP, Riley Point Fire Reforestation, and Southwest Fuels Project. Inventory areas were selected by reviewing known element occurrences for habitat, soils, elevations, aspects, etc. New plant locations were confirmed by specimen collection, which was authenticated by Wyoming Natural Diversity Database (WYNDD) personnel.

Tucker Galloway, Biological Technician, expanded the extent of the known *Cypripedium montanum* population near Story, both upstream and downstream along South Piney Creek. He also documented a new population in the Little Goose Creek drainage along the Forest boundary. An additional population of *C. montanum* was documented just off the Forest along the Red Grade road.

A new population of *Penstemon caryi* was documented on the south end of the Forest. In addition, a monitoring project for this species was to be set up prior to the Little Horn Rx Burns. Unfortunately, the one population within the burn units was burned over in 2003 by the Riley Point Fire. Therefore, the site was revisited in 2004 to see how the plants fared. As predicted, the fire skipped over the site as the vegetation was too sparse to carry the fire. Another *Penstemon caryi* site, near Fisher Mountain, was within the perimeter of the 2003 Little Horn II fire. This site was also visited. Some tufts of grass had been blackened, but not all the fine fuels had been consumed. Plants of *Penstemon caryi* in that area were growing vegetatively in 2004.

Earl Jensen, a contractor, looked for *Penstemon laricifolius* ssp. *exilifolius* and *Pyrracoma clementis* var. *villosa*. Mr. Jensen relocated plants at the 1955 site for *Pyrracoma clementis* var.

villosa, but did not find any more sites in 2004. He found *Penstemon laricifolius* ssp. *exilifolius* off the Forest but not any on the Forest.

2004 was the fifth year of *Rubus arcticus* var. *acaulis* population trend monitoring. WYNDD botanist Walt Fertig developed this protocol in 1999. The objective of this monitoring was to detect whether or not the population is increasing, decreasing or remaining stable. Considering the *Rubus* inventories done when the plant was “discovered” in 1996 and additional surveys thereafter, it is very likely that this is the only occurrence of this species on the Bighorn. For Plots 2, 3 and 4, there has been no significant change. However, Plot 1 had a significant change from 2000 to 2004. Plot 1.5 also had a significant change, but it was from 2003 to 2004 and Plot 5 had a significant change between 2004 and both 2000 and 2003. At this point, these changes are assumed to be attributed to yearly fluctuations in moisture.

2004 was the second year for monitoring *Cypripedium montanum* in the Story Project Area. Six plots (2 controls outside the units and 4 within the units) were established in 2003, prior to any thinning operations. By survey time in 2004, three of the four plots within the treatment units had been thinned through, but neither pile burning nor broadcast burning had been conducted. Since this was only the second year of data collection, it was too early to draw any conclusions. There was one notable difference between the two years of collected data; there were considerably lower number of flowers in 2004 compared to 2003. That may be attributed to the early warm temperatures in March and April followed by a cold spell (and snow) in mid-May, causing the flower buds to be damaged by freezing temperatures. In 2004, an additional piece of data that was collected: a capsule count to determine fecundity (flower/fruit ratio).

In addition to the FY04 Region 2 Sensitive Plant Species, additional species searched for included *Sullivantia hapemanii* var. *hapemanii* (Hapeman sullivantia) (2 new populations found), *Symphyotrichum molle* (Soft aster), *Echinacea angustifolia* (Echinacea), *Musineon vaginatum* (Sheathed musineon), and *Botrychium* ssp. (grapeferns). These additional species are proposed in the draft forest plan revision as Bighorn National Forest Species of Local Concern or Demand species.

As part of the Little Horn prescribed burns, monitoring was supposed to have been set up for *Symphyotrichum molle*. Surveys within the perimeter of the Riley Point Fire found plants flowering in 2004. In addition, surveys across the Forest revealed 12 more populations of *S. molle*, which may have been new populations or simply extensions of previously described populations. Based upon the abundance (42 populations) and distribution of *S. molle* on the Forest, response to fire (WYNDD, 2000), and WYNDD moving it from its Species of Concern list to Species of Potential Concern list, it is recommended that *Symphyotrichum molle* be removed from the Bighorn National Forest Draft Species of Concern List or at least receive a lower priority for surveys.

Table 9. FY04 sensitive species on the Bighorn National Forest.

Sensitive Species	New Occurrences in FY 2004	Expanded Occurrences in 2004	Previously Known Occurrences
<i>Penstemon caryi</i> Cary's beardtongue	1	1	13
<i>Cypripedium montanum</i> Mountain lady's slipper	1	1	3

Sensitive Species	New Occurrences in FY 2004	Expanded Occurrences in 2004	Previously Known Occurrences
<i>Cypripedium parviflorum</i> Yellow lady's slipper	0	0	3
<i>Eriophorum chamissonis</i> Russet cotton-grass	0	0	3
<i>Physaria didymocarpa</i> var. <i>lanata</i> Wooly twinpod	1	1	3
<i>Pyrrocoma clementis</i> var. <i>villosa</i> Tranquil goldenweed	0	1	1 extant and 2 historical
<i>Rubus arcticus</i> ssp. <i>acaulis</i> Northern blackberry	0	0	1
<i>Utricularia minor</i> Lesser bladderwort	0	0	1
<i>Festuca hallii</i> Hall's fescue	0	0	1 (?)
<i>Parnassia kotzebuei</i> Grass-of-parnassus	0	0	1
<i>Penstemon laricifolius</i> ssp. <i>exilifolius</i> Larchleaf beardtongue	0	0	0

Wildlife

The wildlife program on the Bighorn National Forest consists of treatments to maintain or improve habitat for many species including Management Indicator Species (MIS) and Threatened, Endangered, and Forest Service Sensitive Species (TES), inventory and monitoring for habitats and specific MIS/TES species, support to other resource projects through inventory and environmental analysis, and conservation education presentations. Habitats currently emphasized are riparian, aspen, and shrublands through treatments such as enclosure construction and maintenance, prescribed burning, and mechanical regeneration treatments. The Forest coordinates with the Sheridan and Cody Regions of the Wyoming Game and Fish Department (WYGF) in managing habitats and populations of wildlife. Two Zone biologists accomplish the majority of the wildlife related work on the Forest. A Forest-level biologist assists in plan revision and program management. The Forest has summarized its current priorities for species and habitat management in a 5 Year Action Plan for the wildlife, fish, and rare plant programs, available at Forest offices.

This report summarizes accomplishments and status of TES and MIS species and their habitats.

TES SPECIES/HABITATS

Species lists, received annually from the U.S. Fish and Wildlife Service, require consideration of the bald eagle and Canada lynx on the Forest, both considered threatened species. No other

candidate or proposed species are currently listed for the Forest. In addition, the Rocky Mountain Region of the U.S. Forest Service updated its sensitive species list in FY 2004. The following accounts provide information for most of these sensitive wildlife species.

Lynx/Carnivores: The Bighorn has participated in the lynx survey following the National Lynx Detection Protocol. This survey required three consecutive years of data collection, and was completed in FY 2002, with no lynx detected. The Forest had received unconfirmed observation reports of lynx in FY2003, but was not able to follow-up on track measurements due to delay in reporting and snowfall. During FY 2004, the Forest received no new reports of lynx observations. Snow track surveys for carnivores were conducted in association with boreal owl surveys, occurring during two days primarily on the Medicine Wheel District, with no rare carnivore tracks or sightings occurring. Refer to the supplemental report.

Cameras were installed in 4 sites on the Forest to monitor for carnivores in FY04. On the East Zone, Dan Thiele of the Wyoming Game and Fish Department (WYGFD) had marten respond to a site. On the West Zone, Jack Clucas (USDA APHIS Wildlife Services) conducted the monitoring on two sites; no rare carnivores were reported. Camera monitoring was intended to detect wolverines, as coordinated on several Forests by Dick Staiger. There had been a sighting of a wolverine at Powder River Pass on Hwy. 16 by WGFDD during FY03. The WGFDD maintains records of wolverine sightings at their Sheridan office.

Few wolf sightings occurred on the Forest in FY2004, as received in anecdotal information. No known predation events on livestock occurred. The previous year, a wolf was removed from the Forest for killing livestock (sheep).

Additional marten sightings occurred as follows: Red Grade road in August near Forest Boundary, High Country Outfitters camp near Porcupine Guard Station, and at Paintrock Lakes.

Bald eagles: No bald eagles were known to have nested on the Forest this year, nor historically. In addition, no known winter roosting occurs on the Forest. However, migrational foraging occurs on the Forest, as documented with the observation of 10 eagles in the Willow Park reservoir area in October of FY2004 during aerial surveys being conducted for beaver.

Bats: Six bat houses were monitored this year on the Forest. The plan was to monitor all houses at least twice each month, once during daylight hours and once after dark. Time constraints did not allow for sufficient monitoring, and most houses were only checked once during the summer and only during daylight hours. The structure at the Sheridan Work Center contained four unknown myotis. The other five bat houses were not used this year. **Caves** provide habitat for sensitive bat species on Bighorn NF. During FY2004 (at the end of October 2003), five caves were visited in the Boyd Ridge area, with only one having a bat occurrence (Suds Ice Box, little brown). Minimal to no recreation use was occurring in these caves. During the same week, seven caves were monitored in the Cottonwood Canyon area of the Medicine Wheel/Paintrock District. Two of these caves, Church and South Fork Ice, had bats occupying them, including Townsend's big-eared bats in each (sensitive species), and moderate signs of recreation use. Finally, the Spanish Point cave on the Medicine Wheel/Paintrock District was surveyed in February of 2004, and again in August. In February, small-footed myotis and Townsend's big-eared bats were found in the cave, while none were found in August (day time roost search). Minimal recreation disturbance had occurred at this cave. Caves on the Tongue District were not resurveyed this year. All information was reported to the WGFDD. Refer to the supplemental reports documenting these efforts.

Boreal owls: No calling surveys were conducted on the East Zone this year, with the exception of one night (two stations) in the Burgess Junction area as part of surveys conducted on the West Zone. Two nights were spent calling for owls on the West Zone. Saw-whet owls were detected; no boreal owls were detected. Areas surveyed included Shell Canyon, Willet and Moraine Creeks, and Granite Creek (adjacent to Antelope Butte Ski Area). Refer to the supplemental reports. The Forest has started placing owl boxes as a different survey/inventory technique. In FY2004, 50 boxes were placed in high elevation spruce/fir forest types along the Dayton Gulch road (FR 15). The installation of another 50 boxes is planned for FY2005.

Goshawks: One new, active goshawk nest was observed on the Tongue District during the 2004 nesting season in the switchback area along Hwy. 14. The nest area is not in or near any planned or active timber sales. The Swamp Timber Sale area was informally surveyed three times during the 2004 nesting season and although adult goshawks have been observed, no active nest could be located. In addition, the Twin Nickel site was resurveyed, with no active nests found. This site has been used successively up until this year following timber harvest completed 5 years ago. The nest in the Ditch Creek area, discovered during a fire in 2003, was not visited this year. On the Medicine Wheel/Paintrock District, the following notes for goshawks were compiled:

- ◆ The Cold Springs nest was not active, and there was no timber sale activity this year.
- ◆ The Bucking Mule falls trail nest was located, with the nest being active and fledglings observed.
- ◆ A nest was discovered in Shell Canyon within the Bench project, also successfully producing fledglings.
- ◆ An additional nest was discovered in the West Tensleep Lake area, successfully producing fledglings.
- ◆ A feather sample was taken from two nests (Switchback and Bucking Mule) and sent in to a research project at Colorado State University examining genetic differences in goshawks throughout their range in the western U.S.

A total of approximately 13 nesting territories are known to occur on the Forest, though this is through limited search effort, and many more are suspected to occur based on potential habitat.

Peregrine falcons: No peregrine nesting activity was observed on the Tongue District during the 2004 field season.

Since release efforts in 1993 on the west slope of Bighorn National Forest, active eyries (nest sites) have been documented in areas of Shell Canyon and Tensleep Canyon. The Wyoming Game and Fish Department (WGFD) monitors peregrine falcon nest sites statewide (typically by helicopter survey). However, the Bighorn National Forest is not surveyed every year. During FY 2004, WGFD was not able to survey Shell Canyon. However, the district biologist did a survey from the ground to monitor a previously known active nest, and it was determined to be active. No active aeries were located on Bighorn National Forest land within Tensleep Canyon.

Amphibians: The three sensitive species on the Forest include the spotted frog, leopard frog, and wood frog. No formal surveys were conducted for amphibians on the Tongue Ranger District. The known breeding sites for spotted frog were monitored, and breeding success was confirmed for the 2004 season. Monitoring of known breeding/reproductive sites was conducted on the Medicine Wheel/Paintrock District at unnamed pond between Adelaide Lake and Mud Lake (wood frog tadpoles) and at the Buckley creek enclosure potholes (wood frog tadpoles and

adults). Amphibian surveys were conducted near Adelaide Lake, and 2 abandoned beaver ponds in Porcupine Basin; no amphibians were found. Additional surveys were conducted in the Battle Park Allotment Management Plan (AMP) area, including Lily Lake and Buckskin Ed Creek, with no amphibians observed. All survey information was sent to the University of Wyoming for incorporation into the Wyoming Natural Diversity Database. Surveys in FY2005 will likely continue to improve distribution information.

A new sighting of spotted frogs was confirmed in the North Tongue watershed (Big Willow Cr.) and reported for the 2004 season. This is significant because prior to this the new discovery, spotted frogs were only known to occur within one portion of one watershed on the Bighorns. The new sighting represents a second watershed where this species is known to occur.

Six toad domes were monitored in Shutts Flat (Tongue District). To date, no amphibians have used the domes. There have been no confirmed sightings of toads on the Bighorn National Forest.

Sage grouse: Sage grouse are currently known to only occur on the western edge of the Forest, with no known leks or wintering habitat use. Sage grouse are thought to only use the Forest as late summer brood rearing habitat, as defined by Connelley et al. (2000). Sage grouse were again observed in the Red Reservoir area in Tensleep/Leigh Cr. canyons in FY04. Upcoming projects involving their habitat are the Battle Park AMP and the Southwest Fuels project. Survey flights are planned for FY05 to determine if there are any leks within 2 miles of the Forest.

Water voles: During FY 2004, the only surveys for water voles occurred in support of the Battle Park AMP analysis. Two trap nights were spent with traps in two locations: Buckskin Ed Creek (upstream and downstream of cabin) and upstream of Lily Lake (Middle Paintrock Creek). No water voles were found during these efforts. There are many unsurveyed sites on the Forest. Surveys of these sites would improve distribution information. The Regional species assessment for this species was completed in this fiscal year, based largely on research from the Bighorn NF.

Black swift: No surveys for black swift were conducted at Bucking Mule Falls, Shell Falls, or Brindle Falls during FY2004, due to lack of time and personnel. This species is not known to occur on the Forest, though potential habitat may occur. No swifts were detected during FY2002 surveys of these sites.

Sightings of TES and other significant wildlife species on the Forest were reported to the Wyoming Observation System, which is maintained by Wyoming Game and Fish Department, and to the Wyoming Natural Diversity Database, which is maintained by the University of Wyoming. These sightings are considered to be sensitive information and are not available to the general public. The recordings are mentioned here only to show that the Forest is tracking and recording all verified TES sightings. These will eventually be input into the Forest Service's new database for terrestrial wildlife, known as Fauna. In addition, the Rocky Mountain Bird Observatory conducted monitoring for sensitive bird species on the Forest, primarily for MIS purposes. Birds sighted included olive sided flycatcher (less than 5 sightings per year) and the Brewer's sparrow (see below for MIS).

The Forest also conducted an **old growth inventory** for the Tensleep watershed in FY2004, paid for with NFIM funds. This was done in anticipation of planned timber harvest in the area and to test a field inventory protocol for this type of habitat that is important for many of the sensitive species listed above. The purpose of the old growth inventory was to determine amounts of

habitat available relative to anticipated levels suggested in the revised Forest Plan. The inventory was performed by a contractor (Northwind) using the Mehl (1992) definitions of old growth. The effort documented adequate old growth to meet the 10% and higher levels suggested in the Revised Plan within each cover type in the Tensleep watershed.

MANAGEMENT INDICATOR SPECIES (MIS)

The Forest currently uses 6 MIS species for forestwide monitoring purposes and for project level analyses (Forest Plan amendment #15, 2002). MIS are required from the 1982 forest planning regulations (36 CFR 219.19). They represent species tied to habitats often affected by management activities. According to the 1982 regulations, forestwide populations are to be monitored, with an assessment of habitat condition and trend associated to known population information. MIS are used as a surrogate for other species, to provide for overall species diversity. The Forest’s MIS currently include **elk, lark sparrow, white-crowned sparrow, red-breasted nuthatch, three-toed woodpecker,** and the **red squirrel**. Revision of the 1985 Forest Plan will likely result in a different set of MIS; three MIS will be retained and three will be replaced with different species.

Elk were selected as an MIS due to their need for cover in conifer habitat, which can be affected by wildfire and timber harvest activities, and due to their sensitivity to human disturbance, which can be evidenced where higher road densities (indicating more use by people) displace elk out of an area. However, there is no requirement for road density or other similar habitat provision in the 1985 plan. Elk security in the Revised Plan would rectify this situation.

Elk are common and are known to inhabit Bighorn NF primarily during spring thru fall, and may be seen at higher elevations on the Forest during mild winters. WGFD manages populations through three big game herd units. These are the North Bighorn, Medicine Lodge, and a minimal amount of South Bighorn herd unit (SE corner of Bighorn NF). Several hunt areas are identified within each herd unit. Population levels are largely managed by hunting, but are also limited by the amount and quality of winter range available and the severity of the winters. Population levels are established to be within the anticipated carrying capacity of the forage resources. Year 2003 Herd Unit reports (WGFD) were used to acquire the following information, which has changed little to the present date.

Table 10. Elk populations and objectives by herd unit on the Bighorn NF.

Herd Unit	Population Objective	Current Population (2003)
North Bighorn	4,100	5,520
Medicine Lodge	3,000	3,100
South Bighorn	2,900	4,879

It should be noted that the herd units include habitat off the National Forest, and animals spend a considerable amount of time off-Forest. This is particularly evident in the South Bighorn Herd Unit, where only Hunt Area 34 occurs on the Forest, a small portion of the overall Herd Unit.

No specific habitat monitoring for elk takes place on the Forest. Habitat requirements are assessed with each project analysis. Winter range off the Forest is monitored occasionally by the WGFD to assess habitat conditions. Currently, the forest plan has established habitat goals

associated with elk hiding cover, measured at the diversity unit scale (approximately 5,000-acre areas). As these areas are assessed during each project-level analysis, a forestwide approach was not sought in this report. Some areas of the Forest have had decreased levels of hiding cover due to fire and timber harvest, mimicking the natural fluctuation in the amount of this type of habitat for elk. Forested cover on the Forest seems to be adequate as timber harvest has only occurred on approximately 20% of the forested acres; approximately 4% of the forested acres have been clearcut (Regan et al 2003), the most disturbing activity (besides fire) to hiding cover.

In addition to hiding cover, there is a general requirement that habitat be provided for MIS for at least 40% of the potential for each species. Only the HABCAP model was planned for use in the 1985 Plan to measure hiding cover. In 1991, the Forest Supervisor, based on recommendations from the Wildlife Task Force, agreed to use the Habitat Effectiveness model to assess the 40% habitat provision at the project scale, weighted by management prescription emphasis. This model incorporated road density. However, this model was not to be held to the accountability that the standard/guideline of the 40% habitat states. This condition led to the development of the elk security model currently being considered in the Revised Plan.

As is readily observed, elk have increased above their population objectives on the Forest. This is largely due to inadequate hunter harvest, and a lack of severe winters that normally raise mortality. Inadequate hunter harvest may be attributed to a combination of high road density on the Forest in certain places (with corresponding high hunting pressure), and private land adjoining the Forest generally not allowing hunter access. This creates refuge areas on the private land for periods as early as July on through the winter.

Beginning in FY05, the Forest will provide a synopsis of changes to elk security habitat that has occurred as a result of project implementation and natural disturbances, as called for in the anticipated Revised Plan. The Forest is currently working on two major projects that will affect elk security, that should be finalized in FY05, including the Clear Crazy Designated Motorized Travel System EA, and the Woodrock Project EIS. Both projects seek to reduce overall open motorized route density that is occurring due to the open "C" area designations that allow off-road travel with motorized vehicles.

Red squirrel and avian MIS: The red-squirrel, red-breasted nuthatch, and three-toed woodpecker were selected as MIS due to their need for mature conifer habitat, which can be affected by wildfire and timber harvest activities. Elements of snags and coarse woody debris are also of importance to these species, and several others on the Forest. The current goal and objective for these MIS as stated in the Forest Plan would be to maintain their habitat at 40% of the potential amount. The Forest has applied the HABCAP model during project level analyses to assess this provision. This model is a spreadsheet that compares existing and planned levels of habitat structural stages (Hoover and Wills 1987) compared to what would be preferred most by that species. The HABCAP model was last updated in 1993, with indices that are still valid.

The following table shows the level of habitat currently occurring for these species at the Forest-wide scale. Numbers for the habitat were derived from the Common Vegetation Unit (CVU) GIS database, based on 2002 values. Two wildfires have occurred since that time of significant size (Little Bighorn and Riley Point); however the approximately 8,000 acres involved would not significantly lower the HABCAP value at the forestwide scale.

Table 11. HABCAP Values for MIS at the forest-wide scale.

Species	HABCAP Habitat Value
Red-breasted nuthatch	47%
Three-toed woodpecker	35%
Red squirrel	71%

There is currently no way to assess the forestwide availability of snags and coarse woody debris. However, as described previously for the elk, there is a limited amount of timber harvest that has occurred on the Forest that could reduce these habitat components. The low figure reported for the three-toed woodpecker is based on the fact that structural stage 5 (old growth) is the highest rated habitat value, and the Forest has not assigned any of the CVU polygons this stage, based on a lack of field inventory. This, too, will be rectified with the Revised Plan designating old growth habitat areas.

In addition, the Forest selected the lark sparrow and white-crowned sparrow as MIS in the 2002 amendment to correspond to grassland and montane riparian habitats, respectively, that can be affected by livestock grazing. Currently, due to a lack of information, the Forest does not have a way of assessing forestwide habitat conditions for these two species.

Approximately 100,000 acres of riparian habitat occur on the Forest, based on photo-interpreted data on the Forest's GIS system (Girard 1997). White-crowned sparrows use both willow and forested riparian types, and this subset of the overall acres is approximately 60,500 acres. Similarly, the forest estimates approximately 18% of the total acres on the Forest are covered by grassland/forbs as displayed in the CVU database, which would be prime habitat for the lark sparrow. The condition of both the riparian and grassland acres affected by livestock grazing is reported in that section of this monitoring report.

To assess populations, the Forest began implementing avian point counts for the avian MIS species and the red squirrel. This monitoring is being conducted by the Rocky Mountain Bird Observatory in Brighton, CO, as this organization was also conducting statewide avian monitoring, and similar monitoring in Colorado. The Forest also provided financial support to the statewide monitoring program. In total, this monitoring costs the Forest approximately \$25,000 per year. Forestwide monitoring involves approximately 40 transects of 15 point counts each, stratified among four primary habitat groups including montane riparian, high-elevation conifer, mid-elevation conifer, and sagebrush-grassland. These four habitats were most representative of the habitats frequently affected by Forest management activities.

This monitoring will provide population trend information for the four avian species and the red squirrel, though detections for lark sparrow and three-toed woodpecker may be less reliable due to their limited distribution, the random process applied in selecting transects, and the limited number of transects per habitat type (10). Initial results indicate an abundance of white-crowned sparrow, red-breasted nuthatch, and red-squirrels, but few detections of three-toed woodpeckers, and no detections of lark sparrows. While lark sparrows occur on the Forest, the sagebrush-grassland habitat group being monitored is not the more pure meadow habitat they may be more readily occupying on the Forest. Trend for these MIS will not be established for approximately 5

years, at the completion of the 2006 field season inventory. However, the following data was provided with the 2004 report from the Rocky Mountain Bird Observatory (Faulkner, 2004), and represents the number of detections by habitat type on the Bighorn NF.

Table 12. Number of detections of Bighorn National Forest MIS species from 2002 through 2004.

Species	High Elevation Conifer			Mid Elevation Conifer			Montane Riparian			Shrubsteppe (Sage/grass)		
	2002	2003	2004	2002	2003	2004	2002	2003	2004	2002	2003	2004
Three-toed woodpecker	2	4	14	0	4	5	0	2	4	0	0	2
Red-breasted nuthatch	32	34	12	36	35	13	17	5	4	7	16	10
White-crowned sparrow	16	22	35	10	29	23	44	111	55	51	117	92
Brewer's sparrow*	2	0	11	5	3	5	3	3	6	78	100	81
Red Squirrel	87	117	181	64	102	119	20	49	70	0	0	39

* While not currently an MIS, this species will be considered an MIS in 2005 with the revised plan. Conversely, the three-toed woodpecker and lark sparrow will be dropped due to less than adequate sample size with this protocol (no lark sparrows detected). The protocol is considered robust based on terms of sample design for the priority habitats.

Species may be detected in multiple habitat types due to the high degree of natural fragmentation on the Forest, where forested areas are broken up by meadows and shrublands and riparian areas. Fluctuations in species' populations are not currently thought to be attributed to habitat differences, as few activities have occurred over the Forest in these three years that would explain the magnitude of difference in these numbers. Rather, populations of these species may be affected by the abundance of prey/forage which may vary proportionally with moisture received. None of the avian species listed above are hunted. Red squirrels are considered small game animals and are hunted, but the numbers taken are not significant. Unauthorized shooting of avian species does occur, however mortality from shooting is not thought to be significant for these species.

The increase in three-toed woodpecker detections may be due to increased spruce beetle activity on the Forest, however this is speculative. Habitat for three-toed woodpeckers is considered to be best represented by old growth Englemann spruce and subalpine fir. This is due primarily to the amount of beetle activity typically occurring in these stands, and the availability of suitable nesting cavities. A gap in the red squirrel information in 2003 for mid-elevation conifer may be due to observer error.

In addition to the survey being conducted by the Rocky Mountain Bird Observatory, Breeding Bird Surveys are conducted for two routes on the Forest, known as the Bald Mt. and Crazy Woman routes. These can provide some indications of trend, though sample size and other biases apply (Sauer et al. 2003, <http://www.pwrc.usgs.gov>). Red squirrels are not tracked

through this monitoring protocol.

Table 13. Breeding bird survey population trends for avian management indicator species.

Species	Bald Mt. Route	Crazy Woman Route	Statewide
Red-breasted nuthatch	+1.6%	+1.4%	+4.0%
Lark sparrow	+0.1%	+0.3%	-1.0%
White-crowned sparrow	+2.9%	+6.5%	+3.2%
Three-toed woodpecker	+1.0%	+0.1%	+4.0%
Brewer's sparrow*	+1.4%	+1.8%	-1.2%

* Not currently MIS but anticipated in Revised Plan

Beaver: While not currently designated an MIS, this species has been proposed as one for the Revised Forest Plan that will likely be finalized in FY2005. In an effort to establish baseline parameters, the following report was compiled. Beaver were selected as an MIS as they provide habitat for many other species and are often associated with willow and aspen, both of which may be affected by livestock grazing, one of the most common and widespread uses of the Forest.

In October 2003 (FY2004), an aerial survey (combined fixed-wing and helicopter) was conducted on the Forest, using GPS to inventory active caches. This survey estimated approximately 200 animals, using a multiplier of 4.5 beaver per food cache observed (Emme and Jellison 2004). The 200 animals also includes a multiplier of 40%, as that was an estimate used in similar surveys in other areas to estimate the number of caches missed from the air (Rutherford 1964; Payne 1970). This survey also includes approximately 32 beaver reintroduced on the Forest from 2000 and 2003. The last survey of beaver population was in 1994, an incomplete survey that estimated approximately 300 beaver. Regardless, there are fewer beaver now than what was likely present historically. In terms of trapping, approximately 25 beaver are taken annually on the Forest (WGFD 2000) by only 4 trappers (for a variety of species). This is due largely to the greatly reduced price available for furs as a result of lack of interest in clothing and other products made from the pelts.

Due to these recognized differences in occupied vs. historic range, and recognition of the positive influence of beaver on riparian habitats, the WGFD and the Forest have sought to reintroduce beaver into unoccupied drainages. As mentioned above, beaver were reintroduced on the south end of the Forest in 2003, with 8 beaver in the Sourdough Creek Area. Previously, in 2000, approximately 24 beaver were placed in spots along the Tongue River on the north end of the Forest. In 2004, approximately 50 beaver were released in drainages on the north end of the Forest in Prospect, Owen, and Marcum Creek drainages. Reintroduction efforts will likely continue in to the future as funding allows.

The reasons for current reduced levels of beaver may include recreational shooting and trapping, purposeful removal due to road interactions (e.g., plugged culverts), disease, and reduced habitat capability due to historic livestock grazing or other ungulate browsing pressures. Many areas on the Forest have signs of older, inactive beaver dams, indicating that many more occurred in the

past. Some beaver on the Forest are currently relegated to ponds that are more secluded and dominated by lodgepole pine and spruce/fir, rather than streams with willows and aspen components that are typically preferred by the species. Though their numbers are less than was historically present, there is no indication that beaver numbers are still declining on the Forest, and the population may be stable. Variations in population numbers are perhaps more noticeable since populations are at a relatively low level currently. Efforts to improve distribution and populations will continue through reintroduction in suitable habitat.

The newly transplanted beaver on Owen Creek were starting to plug a culvert on Highway 14. This necessitated the installation of a “beaver deceiver,” a fence intended to prevent beaver access to the protected site. The Forest Service provided labor and the WGFD provided materials which were purchased with monies collected from the Bowhunters of Wyoming. Monitoring of other release sites indicated no additional problems with beaver plugging culverts. In FY2004, a beaver deceiver was constructed on Porcupine Creek in anticipation of beaver again occupying the site.

Habitat conditions for this species will be assessed in conjunction with the riparian/water quality and livestock grazing monitoring currently being developed as part the Revised Plan. In the interim, refer to the riparian acres meeting or moving towards Desired Condition reported in the livestock grazing section of this annual monitoring report.

IMPROVING WILDLIFE HABITAT DIVERSITY

In addition to the support to projects previously mentioned, the following activities also occurred in FY 2004.

Aspen: Previously established transects and photo points are used to monitor and partition use of aspen between domestic livestock and wildlife. Exclosures are constructed and maintained to encourage regeneration following treatments and to provide monitoring opportunities.

Field inspections and/or photo points were taken at the following aspen stands during the 2004 field season by wildlife personnel on the Medicine Wheel-Paintrock District: an aspen stand in the Lower Pasture in the Granite Allotment and two aspen stands in the Lower Shell Pasture of the Shell Creek Allotment. Other aspen stands were inspected/photos taken by district range specialists and are included in the Range section of this monitoring report.

During the 2004 field season, exclosures around aspen stands on the Medicine Wheel-Paintrock District at Shell Creek, Ruble Creek, Shell Canyon, Woodchuck Bench, and Toe of Cement were inspected, vegetation condition was documented, and maintenance was performed where necessary. In addition, a new exclosure was constructed at Deer Spring and Ruble Creek during 2004. The Deer Spring site is heavily used by livestock, whereas the Ruble Creek site is more attributed to wildlife browsing damage. The project at Ruble Creek was funded in partnership with the Bowhunters of Wyoming. These exclosures encompass approximately 45 acres.

Table 14. Aspen exclosures on the Tongue District maintained during 2004.

Drainage	Number of exclosures	Area
N. Tongue	2 exclosures	1 acres
Marcum Creek	1 exclosure	2 acres
P.K.	3 exclosures	7 acres
Sheeley cabin	1 exclosure	3 acres

Drainage	Number of exclosures	Area
Hay Creek	6 exclosures	8 acres
Dry Fork	1 exclosures	4 acres
Camp Creek	1 exclosure	1 acre
	Total	26 acres

In addition to the above, the “new” exclosure in Hay Creek was monitored. It appears that fencing alone is not sufficient to allow the aspen to restock this site, and prescribed burning was attempted to remove shade from competing vegetation and to promote suckering (sprouting) of aspen from the live roots remaining inside the exclosure. Monitoring indicated that burning is needed, but was not conducted this season due to weather constraints.

Table 15. Aspen exclosures on the Powder River District maintained during 2004.

Drainage	Number of exclosures	Area
Lower Buffalo	1 exclosure	0.5 acres
Billy Creek #1	1 exclosure	1 acres
Billy Creek #2	1 exclosure	2.5 acres
	Total	4 acres

In addition to the above, the Grommund Mystery aspen exclosure was monitored this year. This fence was constructed to exclude cattle but not big game and is not effective in protecting aspen sprouts from browsing. A decision was made to remove this fence during the 2005 field season as there are no viable aspen sprouts remaining.

Also, a new aspen exclosure was constructed this year at the Trigger Lake aspen site. Approximately 2 acres were excluded using a new type of plastic mesh fence to determine if this cheaper fence construction will be cost effective while still protecting the aspen from browsing by big game animals.

A total of 10 acres of aspen retention was accomplished on the Tongue District. Another 19 acres were accomplished on the Powder River Ranger District. The objective of this project is to remove all conifers within existing aspen stands to prevent the area from converting to a coniferous forest over time. The work was funded with KV monies collected from the sale of small forest products such as Christmas tree and transplant permits. Areas treated on the Tongue District were at Marcum Creek and Rapid Creek. Areas treated on the Powder River Ranger District included Muddy Creek, Highway 16 at the Elgin turnoff, Trigger Lake, and Rabbit Creek.

Willow/Riparian: During the 2004 field season on the Medicine Wheel-Paintrock District, inspection and maintenance was performed as necessary on 12 willow/riparian exclosures (approximate total of 455 acres). Condition of willow/riparian vegetation within the 12 exclosures was also documented. During the 2004 field season, the following willow/riparian areas were monitored on the Medicine Wheel-Paintrock District:

- ◆ Photo points at Sheep Creek #1, #2, and #3 were taken prior to livestock entering pasture.
- ◆ Willow photo points and a line intercept transect on Granite Creek were monitored, just after livestock entered the pasture.

- ◆ Numerous other ongoing monitoring of willow-riparian utilization by wild ungulates and domestic livestock was conducted at various locations throughout the Medicine Wheel-Paintrock District by range management specialists, and that information is included in the Range Section of this monitoring report.
- ◆ An additional enclosure was put up at Mill Creek for fisheries habitat to protect Yellowstone cutthroat trout, as reported in the fisheries section.

All of the riparian enclosures (see following table) on the Tongue District were maintained this season. These enclosures protect 268 acres of riparian habitat and a total of 4.41 miles of fisheries streams.

Table 16. Affected streams and enclosures on the Tongue District maintained in 2004.

Drainage	Number of enclosures	Area	Mile of stream
Bull Creek	1 enclosure	3 acres	0.2 mile of stream
East Fork	1 enclosure	82 acres	1.1 mile of stream
Fool Creek	2 enclosures	17 acres	1 mile of stream
Hwy 14 bridge	1 enclosure	0.5 acre	0.01 mile of stream
Lick Creek	1 enclosure	21 acres	0.5 mile of stream
Little Willow	1 enclosure	15 acres	0.2 mile of stream
Preacher Rock	1 enclosure	89 acres	0.7 mile of stream
Ranger Creek	1 enclosure	27 acres	0.4 mile of stream
Sucker Creek	1 enclosure	13 acres	0.3 mile of stream

All of the riparian enclosures on the Powder River District were maintained this season. These enclosures protect 5.5 acres of riparian habitat.

Table 17. Riparian enclosures maintained on the Powder River District in 2004.

Area	Number of enclosures	Size
Hunter Creek Pasture	1 enclosure	1/4 acre.
South Hospital Hill	1 enclosure	1/4 acre.
Hunter Mesa Riparian	1 enclosure	1/4 acre.
Hunter Mesa Cow	1 enclosure	1/2 acre.
Hunter Mesa Wildlife	1 enclosure	1/2 acre.
New Hondo Creek	1 enclosure	1/4 acre.
Grommund Creek	1 enclosure	3/4 acre, 300' of stream.
Dry Poison Creek	1 enclosure	2.5 acres, 1,000' of stream
#1 Hansen Sawmill	1 riparian enclosure	16' x 16'.
#3 east	1 riparian enclosure	16' x 16'.
#4 Hansen's spring	1 riparian enclosure	16' x 16'.

Some of the above exclosures are designed to exclude big game animals, and some exclude cattle only. Monitoring has shown that annual maintenance is more cost effective than allowing the exclosures to deteriorate and then invest more work to bring them up to standard. Also, it has been shown that even one year of browsing inside an exclosure can set the vegetation back far enough to require several years of protection to recover.

Willows were not transplanted into empty cages inside the Fool Creek, Lick Creek, and Bull Creek exclosures again during FY 2004. Preliminary discussions with Wyoming Game and Fish are moving toward cooperative efforts to monitor and manage browse use of willow. Two willow monitoring transects were re-read on the Powder River District in FY 2004. Transects for willow and livestock/moose use in the North Tongue area were monitored by range personnel in FY 2004.

Wildfire/Prescribed Burning and Monitoring: Monitoring of past prescribed burns on the Tongue District did not take place during FY 2004 due to lack of personnel available. The specific burns to be monitored included Kerns, Tongue Canyon, and Dry Fork/Skull Ridge.

Monitoring of prescribed burns on Medicine Wheel-Paintrock District included establishing two photo-points and associated transects in the Upper Shell prescribed burn. This was done one growing season after the burn and is planned to be revisited during FY2006. Additionally, monitoring was conducted at Salt Creek and Pete's Hole proposed prescribed burn sites to establish existing condition prior to burning. Photo points were taken at Pete's Hole. At Salt Creek, a photo point and associated line intercept transect was established. These will be revisited one growing season after the burns are completed.

Prescribed burn projects accomplished during FY2004 that also benefited wildlife are listed under the Fire section of this monitoring report.

On the Tongue District, a prescribed burn in the Hay Creek #3 aspen exclosure was attempted and abandoned when it became obvious that the fire would not meet our objectives in 2003. In 2004, weather did not permit a second attempt at prescribed burning. Burning was conducted on two units of the Schuler Timber Sale in FY2004. These burns were designed primarily to remove slash in clearcuts to create sites in which to plant new trees. Wildlife concerns included retaining large woody debris in sufficient quantities to provide habitat for small rodents. This objective was fully met, and the burned units should serve as a show case in terms of desired post-burn condition.

More of the Dry Fork Unit #3 was burned during fall of 2003 and in September of 2004 (all in FY2004). A total of 670 acres of grass and sagebrush were burned. This project is partially funded by the Rocky Mountain Elk Foundation.

One unit of prescribed burning was completed in the Little Horn Canyon in spring of 2004. The majority of the unit was burned by a wildfire in 2003, and about 20 acres remained to be treated. The objectives for that unit were fully met, and a "buffer" has now been started between the cabins in the lower canyon and the remaining burn units farther upstream. Plans are under way to continue with the prescribed burning in FY2005.

Several burns were conducted on the Powder River Ranger District during FY2004. A total of 842 acres were burned on Hospital Hill and in Crazy Woman Canyon. This project (South Slope burns) accomplishes wildlife objectives.

Other Habitat Projects: Areas treated for conifer encroachment into meadows on the Tongue District were primarily along Highway 14 at “the curves,” on Cutler Hill, and around the Marcum Creek aspen enclosure. A total of 42 acres were treated this year. In addition, approximately two acres were treated on the Powder River District. One small area (2 acres) was treated for conifer encroachment (mechanical method) into wetland/riparian habitat on the Medicine Wheel-Paintrock District.

No meadow encroachment work was accomplished on the Powder River Ranger District this year. Candidate areas were located during the 2004 season, and work will be accomplished in 2005.

On the Tongue District, 77 bluebird houses were monitored this year. Nesting success was about average, and there are no concerns or indicators of a downward trend for this species. Many of the nest boxes have been exposed to weather for up to 10 years, and most have deteriorated to the point that repairs are not feasible. The data recorded is not showing anything new or adding to our knowledge base. For these reasons, 2004 is the last year of intensive monitoring. In the future, the boxes will be cleaned out each fall to prepare them for the next year’s nesting season, but we will not record bluebird nesting success for each box.

A bluebird house project was also begun on the Powder River District, with a trail established along the Hazelton Peak road and another near the Muddy Guard Station. A total of 25 boxes have been installed and nesting success was monitored throughout the 2004 season.

The swallow condos at Burgess Ranger Station were monitored during the 2004 field season. All condominiums are being used and no further work is required.

Nest boxes for kestrels were maintained and monitored again on the Tongue District. A total of 6 boxes are currently installed. Annually, boxes are cleaned the boxes out and fresh layer of wood chips added. This year, no boxes were occupied by kestrels.

Wildlife Support was provided for the following environmental analyses/projects:

- ◆ Story Prescribed Burn Project.
- ◆ Cramer/Big Horn Mountain Lodge land sale.
- ◆ Clear/Crazy Designated Motorized Trail System EA
- ◆ Woodrock Timber Sale.
- ◆ Bench Timber Sale (HFRA).
- ◆ Bald Mountain Salvage Sale
- ◆ North Tongue Grazing AMP.
- ◆ Trapper, Dry Fork Medicine Lodge, Forks Grazing AMP.
- ◆ Devils Canyon AMP
- ◆ Battle Park AMP
- ◆ Southwest Fuels
- ◆ South Slope Rx Burns
- ◆ Tiehack Reservoir Land Exchange

PUBLIC EDUCATION EFFORTS – WILDLIFE

The Forest again participated in the Casper Hunting Expo that targets schoolchildren, coordinated by the WGFD. The Medicine Wheel-Paintrock District biologist hosted the Kids' Fishing Day at Porcupine Guard Station and also conducted a bird walk and interpretive program for children on Migratory Bird Day in Lovell. The Forest also provided interpretation for a field trip for Wyoming school teachers, hosted by the University of Wyoming and Sheridan College.

SOCIAL COMPONENTS

Heritage Resources

PROGRAM SUMMARY

The program priority remains project level support and an increased emphasis on Section 110 surveys. In FY 2004, Section 110 survey work was initiated or continued on the Sheep Mountain, Hunt Mountain, and Leigh Creek historic districts. That work will continue into FY 2005.

The FY 2003 monitoring report thoroughly reviewed the draft Revised Plan heritage resource direction, and concluded the following:

“In conclusion, the 1985 Forest Plan is deficient for determining compliance with federal laws, as it lacks definable mileposts to measure and document if the Forest is meeting its program management objectives, as well as meeting federal laws, regulations, and Forest Service policies. The Revised Forest Plan will give specific direction and targets to insure a proactive program by 2005.”

IMPLEMENTATION MONITORING

Monitoring Requirement 1: Professional field evaluation of two randomly selected projects (forestwide)

Personnel examined two NEPA projects associated with the management of the Bighorn Medicine, National Historic Landmark.

Monitoring Requirement 2: Sample field evaluation of identified cultural resource properties requiring protection (any eligible or unevaluated site)

On the Tongue District, nine prehistoric heritage resource properties associated with grazing permit reissuance were evaluated for impacts. All nine sites were incurring impacts. The impacts to these sites are considered threatening to their eligible status and include impacts from grazing, wildlife, vandalism, and erosion. At present, mitigation plans are being designed to lessen the impacts. Implementation of mitigation measures began in 2004 and should be completed by 2008.

Additionally, three Heritage Resource properties on associated with the Bighorn Medicine Wheel were monitored. No impacts were noted.

EFFECTIVENESS MONITORING

Two goals are associated with effective forest plan monitoring: 1) identify appropriate resource management and 2) initiate actions to reduce deficiencies.

In 2004, the Forest continued its concerted effort in meeting the objective of goal #1. This was accomplished through the grazing permit renewal process, specifically, by the establishment of quantitative monitoring localities (5). On a programmatic level, analysis of heritage resources management is occurring by watersheds for forest plan revision. The data has reflected that appropriate integrated resource management is improving. For example, if present grazing standards are met, impacts to heritage resources are generally minimal.

The Forest continues to deal with deficiencies at a project specific level versus at the Forest level. This is not to say one level or the other is better, but the 1985 Forest Plan lacks any direction in this area. Historically, the Forest had little incentive to manage heritage resources at the Forest level. By default, deficiencies are only identified and dealt with at the project specific level, which may not be the level to analyze the deficiency nor cost effective.

However, the Forest has recognized the need to deal with heritage resources at a Forest level. Ongoing efforts continue to be more efficient through the use of Programmatic Agreements (PAs). Presently, the Forest and Region 2 is working on a master PA that will incorporate all past individual PAs (i.e., range, wild fire) within one document. The agreement will include standard operating procedures for several reoccurring programs of work, and will include exceptions of actions from 106 reviews

VALIDATION MONITORING

The 1985 Forest Plan goals and objectives are lacking in most areas. The laws upon which they were initially based have since been amended, and present forest plan direction is inadequate and/or inconsistent with the new amendments. For example, the 1985 Plan provides no direction for setting resource priorities for recreational needs, nor requirements of executive order 13007. Also, monitoring requirements should be updated to include reporting the reduction in backlog of unevaluated sites on the Forest.

In essence, the 1985 Plan has no real “mileposts” to determine compliance with the variety of laws, regulations, and policies associated with heritage resource management, specifically, Sections 106 and 110 of the National Historic Preservation Act (NHPA).

Key elements that should be address in the Forest Plan monitoring section are clearly expressed in the NHPA and reiterated in FSM 2360. Examples of language found in the NHPA are:

Section 106

The head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation established under Title II of this Act a reasonable opportunity to comment with regard to such undertaking.

Section 110

a) (1) The heads of all Federal agencies shall assume responsibility for the preservation of historic properties which are owned or controlled by such agency.

(2) Each Federal agency shall establish (unless exempted pursuant to Section 214) of this Act, in consultation with the Secretary, a preservation program for the identification, evaluation, and nomination to the National Register of Historic Places, and protection of historic properties [balance program]. Such program shall ensure —

(iii) provide for the disposition of Native American cultural items from Federal or tribal land in a manner consistent with section 3(c) of the Native American Grave Protection and Repatriation Act (25 U.S.C. 3002(c); [NAGPRA]).

Guidelines, Park Service

The program should try to ensure that the agency's officials, employees, contractors, and other responsible parties have sufficient budgetary and personnel resources needed to identify, evaluate, nominate, manage, and use the historic properties under agency care or affected by agency actions.

To rectify the situation mileposts have been established to track compliancy with Section 110 of the NHPA. These milepost have been incorporated into the Revised Forest Plan and will be the primary tool to track heritage resource compliance along with the two present elements noted above.

Table 18. Mileposts defined in new plan, Section 110 accomplishments.

Element	Measurement	Accomplishments		Comment/Total
		Past	2004	
NEPA projects monitored	Two projects yearly	N/A	Two	Both
Sites monitored	Yearly, as defined in PAs	N/A	13	Four sites No impact. Nine sites under mitigation associated with Tongue AMP
Acres Class III surveyed; Section 110	500 acres yearly	2,014	0	Firm target beginning in 2005/Total 2,014
Evaluate new sites	Varies, number of sites found during Class III inventory	13	0	
Backlog of un-evaluated sites	50 sites over 15 years of new plan	3	0	Firm target beginning in 2005/3
Historic preservation plans completed 2002/ since 1985	10 over life of plan	2	2	2004 sites are works in progress/2
Sites nominated to the National Register Of Historic Places 2002/ since 1985	As appropriate	2	2	2004 sites are works in progress/2

EVALUATION AND CONCLUSIONS

The 2004 monitoring program results reflect that the Bighorn National Forest continues to have impacts to heritage resources by natural deterioration, grazing activities, vandalism, and wildlife activities (burrowing rodents). Additionally, although the forest plan states, “follow the laws” in the standard and guideline section, no mileposts were established to determine legal compliance. Analysis of how effective the direction in the forest plan is can only be accomplished by established mileposts. This methodology (see previous table) has been incorporated into the Revised Forest Plan and will clearly show if the Forest’s program for compliance with federal laws, and development and implementation of an effective heritage resource program is adequate.

In conclusion, the 1985 Forest Plan is deficient for determining compliance with federal laws, as it lacks definable mileposts to measure and document if the Forest is meeting its program management objectives, as well as meeting federal laws, regulations, and Forest Service policies. The Revised Forest Plan will give specific direction and targets to insure a proactive program by 2006.

Lands and Special Uses

The Lands and Special Uses Program on the Forest consists of real estate and boundary management including land acquisition and adjustments, withdrawals, public access, and the administration of a wide variety of special use authorizations, including permits, leases, and easements.

The Forest administers approximately 500 authorizations, including 150 non-recreation uses such as communication sites, municipal and agricultural reservoirs, pipelines, power lines, a fish hatchery, roads, and a variety of miscellaneous uses. In addition, the Forest permits approximately 375 recreation uses, including outfitter/guiding operations, recreation residences, three organization camps, ten resorts, two ski areas, numerous group use and recreation events, and a Forest-wide campground concession permit. With 265 summer home permits, the Bighorn has the most recreation residences in the Rocky Mountain Region.

In addition to the administration of existing permits, the Forest receives several new applications annually. Special uses staff reviewed and processed new authorizations for resorts, road easements, reservoir easements, and other uses. District staff reviewed and processed special-use permits for outfitter-guides, recreation residences, group and recreation events, and temporary non-recreation uses.

Projects in FY 2004 and ongoing into FY 2005 included the analysis of the Tie Hack Reservoir Land Exchange proposal, meeting the Forest’s landline target, and resolving various trespass cases. The Land Exchange is expected to be complete in the spring of 2005. The Forest has also been working to identify and resolve public access issues when possible. Administration of resorts continues to be a priority.

The Forest does not have a current capacity analysis on which to base the issuance of new outfitter-guide permits, therefore new commercial/for-profit permit proposals are denied based on the 36 CFR 251.54 Initial Screening Criteria. A Capacity Study, Needs Assessment, and Allocation process was initiated in 2004 and is scheduled for completion in FY2005.

Approximately 50% of recreation residences were inspected for compliance with the terms of their permit. As part the re-issuance process, heritage resource surveys were completed for all 265 recreation residences.

Two institutional permits were re-issued on the Medicine Wheel/Paintrock Ranger District. Three recreation events permits were issued and administered. Thirteen priority outfitter and guide permits, two ski area permits, and three resort permits were administered.

The Tongue Ranger District conducted Outfitter Guide (OG) inspections for eight permittees during 2004, some of which were to remote base camp locations. One permittee was on a probationary rating for not complying with the terms and conditions of the permit relative to Wyoming Game and Fish regulations. Inspections were completed for 28 recreation residence permittees. To monitor for compliance, a total of six recreation event permits were inspected. Inspections were also completed for both organization camps on the District. Three non-recreation, special use permits and two recreation event permits were inspected for compliance.

IMPLEMENTATION MONITORING

Monitoring Requirement 1: Ensure compliance with terms of authorizations and operating plans

Inspection and compliance checks are performed to ensure compliance with permit requirements. Due to limited personnel and lack of funding, many permitted uses are not inspected often enough to ensure that the terms of the permit are being met. Staffing is such that only elements of health, safety, and environmental protection are administered to standard. Lack of communication site plans makes administration of the Forest's communication sites difficult. Forest Service directives state that updated Management Plans be prepared for all sites, but limited staffing has been prohibitive.

On the Medicine Wheel-Paintrock District, performance evaluations on approximately 50% of outfitters & guides have been accomplished to date, with the rest scheduled in the spring of 2005. Resort operating plans are in place for all three resorts on the Medicine Wheel-Paintrock RD.

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Monitoring Requirement 2: Effects on non-National Forest land management practices on adjacent or intermingled National Forest System lands or on forest goals and objectives

Activities such as grazing, timber harvest, building and road construction, and recreation uses on adjoining and intermingled lands continue to increase. Public access to the Forest continues to be an issue. There are numerous unauthorized accesses across NF to private lands such as Camp Comfort, French Creek Cow Camp area, Hazelton area, and Canyon Creek estates. Unauthorized road maintenance is occurring on these roads.

EFFECTIVENESS MONITORING

The Lands and Special Uses Program complies with the limited direction found in the Forest Plan. Forest Service manuals and handbooks provide principal management policy and

procedures. Limited funds resulting in understaffing make it impossible to adequately administer all permits to these established standards.

The trespass cabin issue on South Paintrock Creek remains unresolved due to lack of priority. The RO minerals staff have made on-the-ground inspections.

VALIDATION MONITORING

An emphasis should be made to utilize a self-monitoring inspection system for all special uses, where a permittee reports his/her compliance with permit standards on an annual basis. This approach has been used successfully on other Forests and, with some initial effort, could work here.

Recreation

Recreation visitor use data collection and reporting in the Forest Service has undergone changes since the Forest Plan was approved in 1985. At that time data was reported using the Recreation Information Management (RIM) system, which contained detailed estimates of use. Use was measured in 12-hour visitor days. In 2001, the National visitor Use Monitoring (NVUM) system was implemented. NVUM was designed as a statistically valid sample of visitor use at the level of a National Forest, but it uses visits as the basic measurement rather than visitor days. The sample process is repeated every four years. On the Bighorn National Forest, NVUM was conducted in 2001 and will be conducted again 2006. NVUM will be the standard monitoring protocol applied once every four years, to better understand the use, importance of and satisfaction with National Forest System recreation opportunities. Some correlations can be made between older visitor use (reported in visitor days) and NVUM visits, although many aspects of the older and newer data are not directly comparable. A complete copy of the FY01 NVUM report is available for review.

The 1985 Forest Plan identified objectives for capacities of the ROS classes expressed in recreation visitor days (RVDs). No monitoring data or techniques concerning this data were conducted in FY2004 to determine the degree to which the Forest is meeting this objective although the mandatory Wilderness registration provides useful information. In addition, information provided by the campground concessionaire, highway department and the visitor centers all serve to provide a more comprehensive view of overall recreation use on the Bighorn National Forest and are described in this section in detail. Under the new plan the Forest will place an increasing reliance on the 5-year NVUM survey to help determine recreation demand / use levels.

Lack of funding and personnel are the greatest challenges to providing a quality recreation program on the Bighorn National Forest. Recreation use continues to slowly increase, placing additional demands on resources already taxed to their limits. The use of snowmobiles and ATVs is becoming more popular, with a correspondingly greater potential for resource damage given the speed and power of these modern vehicles.

In spite of these developments, the fiscal realities facing the recreation program are making it increasingly difficult to respond to these factors. As a result, it appears that the long-term solution to this is that public will be asked to help through participation in volunteer programs

and/or through a greater share of their resources by initiating new user fees (similar to the ATV registration law passed in 2001).

Forest visitation at our visitor centers and the Medicine Wheel in 2004 was generally comparable to 2003. However, users of concessionaire-operated campgrounds decreased by 9% compared to 2003 levels. Forest visitation (as measured by Wyoming Department of Transportation counters) was unchanged at the Burgess Junction counter, and slightly down (-7%) at the Tensleep East counter, which is most likely due to the highway reconstruction project on Hwy 16 west of Buffalo. Highway traffic counts supplied by Wyoming Department of Transportation continue to be a less-than-ideal indicator of Forest use. The Forest is establishing traffic counters on Forest roads to provide a better source of data in the future.

PARTNERSHIPS AND VOLUNTEERS

Recent emphasis has been made to highlight the efforts of partnerships and volunteers as a Forest monitoring item. Volunteer groups and individuals were used throughout the Forest to help perform a variety of recreation duties including trail maintenance, campground and facility maintenance, signing, patrols, visitor contacts, interpretation at visitor centers, horseback patrols, trash pick-up, cave clean-up, and grooming cross country ski trails. Some examples of how volunteers and partnerships enhanced the Bighorn National Forest's recreation program are shown below:

- ◆ The Powder River Ranger District received approximately 4,000 hours of contributed volunteer time during FY 2004. Projects included trail maintenance, Leave No Trace sessions, water quality sampling, National Trails Day observance, removal of substandard wilderness bridges, campsite monitoring, database cleanup, and work with disadvantaged youth in cooperation with the YMCA and local Boys and Girls club.
- ◆ On the Tongue Ranger District, six volunteer hosts helped maintain campgrounds, picnic areas, trailheads, and dispersed sites across the District. Several area high school AP classes performed trail maintenance on the Tongue River (1/8 mi) and Penrose Story (1.5 mi) trails and cleaned up trash inside the Tongue River cave. The Black Mountain Nordic and Blacktooth Cycling Clubs of Sheridan performed trail maintenance on the Sibley and Cutler Cross-Country Ski Trails.
- ◆ Volunteers accomplished approximately 42 miles of light trail maintenance on the Medicine Wheel-Paintrock RD.

IMPLEMENTATION MONITORING

Monitoring Requirement 1: Developed recreation use

Users of concessionaire-operated campgrounds decreased by 9% compared to 2003 levels. Visitation at the two Visitor Information centers (Shell Falls and Burgess) remained steady in 2004. Sales of interpretive materials topped \$107,000 at Shell Falls and \$92,000 at Burgess Junction.

Visitation at the Medicine Wheel is comparable to last year, with approximately 11,662 visitors in three months. Due to budget, there were less interpreters and the site was staffed fewer hours than in past years, which means these visitation numbers probably do not reflect true visitation.

The 14-day stay limit continues to be a problem in the more popular developed campgrounds. Visitors are avoiding the stay limit by reserving a site for 13 or 14 days and then turning around and reserving it for another 13-14 days. To address this, the Forest conducted scoping on proposed revision of the current 14-day camping limit.

Monitoring Requirement 2: Developed site facility condition

Operation of most developed recreation facilities continues under the terms of a special use permit reissued to Gallatin Canyon Campgrounds, a division of Canyon Enterprises, Inc., with offices in Bozeman, Montana in 2001. The concessionaire provides an acceptable level of campground operations and maintenance. Some rehabilitation and/or redesign is needed in order to meet resource and user desires is needed, however. Many of the existing vault toilets do not meet Regional SST (“Sweet Smelling Toilet”) standards.

On the Powder River Ranger District, concessionaire completed fence reconstruction projects at Middle Fork and Crazy Woman Campgrounds as part of the Granger-Thye offset of fees.

On the Medicine Wheel-Paintrock District, Shell Falls design is completed and a \$50,000 grant is in hand for the trail reconstruction. A second grant proposal has been submitted for the parking, plaza, and building reconstruction funding. Trail reconstruction is expected to start this spring. If funded, parking, plaza, and building reconstruction will begin in September 2006. A contract is being prepared for design of a micro-hydro power system.

The new Jaws trailhead in T56N, R91W, S18 is 99 % completed. Contract will be finished in 2005 when accessible. This trailhead will serve the southern end of the Bucking Mule National Recreation Trail. Reconstruction of the Bucking Mule Trailhead is approximately 95% finished. Contract will be finished up in 2005 when accessible. Work included replacement of the toilet and hitching rails, a new bulletin board, and accessible loading ramp, reconstruction of the horse watering trough, and new signing. This trailhead serves as the northern end of the Bucking Mule National Recreation Trail.

An old wooden toilet at Bald Mountain CG was replaced with a new accessible CXT concrete toilet.

Design started on the Battle Park Trailhead and dispersed use area re-construction. This project will be funded in 2006 through the Capital Improvement Program.

Monitoring Requirement 3: Dispersed recreation use and experience level

As noted in past monitoring reports, participation in dispersed motorized recreation activities continues to grow. Many miles of user-created trails occur through meadows and streams in designated “C” areas (motorized vehicles in these areas are allowed to travel off roads and trails.)

An agreement with the state of Wyoming to patrol the groomed snowmobile trail system on the Bighorn National Forest performed sufficiently in 2004. Forest Service employees patrol the trails and parking lots to check for compliance with travel regulations, as well as the state’s snowmobile registration sticker program. Compliance with the sticker program has been good.

Motor vehicle traffic on native surface roads during the extended hunting seasons continues to have a significant impact on the resource due to the wet road conditions. Hunting seasons for elk now last from September 1 until mid-December (fifteen-week period or over 25% of the snow-

free year). Use during the fall has the biggest impact on road drainage structures due to the alternating freeze-thaw periods.

Dispersed long-term trailer camping continues to be a major concern. In some instances trailers are left unattended for long periods of time and license plates are removed so ownership is difficult to determine. The number of desirable dispersed campsites is limited. Occupancy of these sites for “trailer storage” exacerbates the problem. The creation of new sites and continual use of those adjacent to sensitive riparian environments contributes to water quality problems. To address this, the Forest conducted scoping for a proposed revision of the current 14-day camping limit.

The Medicine Wheel portion of the Medicine Wheel-Paintrock Ranger District continues to receive heavy dispersed use from Highway 14A north. Two volunteers stationed at Porcupine Ranger Station remain critical to monitoring this use. Heavy use also continued in the Battle Park area. Patrols in this area were increased to twice-weekly site visits, which was a significant allocation of resources. Violation notices were issued for uncertified feed, and users were counseled on horse containment methods.

Monitoring Requirement 4: Off-road vehicle damage

Off-road and trail vehicle use continues to be a highly popular activity on the Bighorn National Forest. With the limited number of seasonals funded in the dispersed program, enforcement and contact with ORV users is minimal. The concept of “unrestricted motorized travel” in the “C” areas encourages new user-created roads. Motorized recreation-related offenses are the most frequently cited category of law enforcement offenses on the Bighorn National Forest, accounting for 39% of total violations in 2004, up from 2003 (nearly 33%) and 2002 (24%).

In 2004, the Powder River Ranger District neared completion of a travel management analysis for the 88,000-acre “C area” in the Clear Creek and Crazy Woman drainages. A decision on the project is Clear/Crazy Designated Motorized Trail System is anticipated in early 2005. The proposal would eliminate all cross-country motorized travel except for snowmachine travel on snow.

As part of the Woodrock Timber Sale Environmental Impact Statement, the Tongue District continued its analysis of the “C” area near Woodrock and Duncan Lake. Similar to the Clear/Crazy proposal, under all alternatives in the Woodrock EIS, motorized travel would be limited to designated roads and trails with no cross-country travel allowed.

Monitoring Requirement 5: Dispersed campsite condition

Campsite numbers and use of dispersed campsites continues to increase based on field observations.

As part of the Woodrock Timber Sale proposal, dispersed campsites along Sucker Creek and the South Tongue River would be limited to designated sites in order to maintain ground cover in riparian areas. Other dispersed camping would be limited to areas more than 100 feet from water. The timber sale and vegetation treatments proposed would create new dispersed camping opportunities in the area of Duncan Lake and elsewhere.

Due to funding constraints, no dispersed campsite condition monitoring was done on the Powder River or Medicine Wheel-Paintrock Ranger Districts in 2004.

Monitoring Requirement 6: Trail construction and reconstruction

Due to a lack of funding, the Forest did not employ a trail crew in 2004, nor was it possible to conduct any trail condition surveys during 2004. As mentioned earlier, volunteers accomplished a moderate amount of light trail maintenance on each of the Districts and remain a critical asset to addressing the issue of continued trail deterioration on the Forest. To meet trail challenges in 2005 and beyond, the Forest will need an adequate level of permanent staffing to train and work with volunteer groups.

Critical trail maintenance needs are increasing yearly. Improper trail locations (riparian areas, fall line, and erodible soils) are a major problem. When heavy use occurs in conjunction with improperly located trails, rapid trail deterioration occurs. Motorized trail travel on the Bighorn National Forest is increasing, and the associated trails are rapidly deteriorating. Trail erosion and resulting resource degradation are at unacceptable levels.

The Forest continued to develop a "Forest Trails Strategy" to prioritize trail construction and maintenance needs. This plan will help identify, emphasize, and focus on critical trail issues.

The Forest continues to cooperate with the state of Wyoming to help make the Off-Road Vehicles program a success and hopes this will result in additional dollars coming to Forest for both maintenance and improvement of motorized routes. The State Trail Crew was scheduled to complete trail maintenance on portions of the Solitude Loop Trail #038 to Willow Park Reservoir but, due to scheduling problems, was unable to complete the work. The work has been re-scheduled for 2005.

A trail reconstruction contract for three miles of the Penrose Park Trail #028 was completed in 2004.

Work on three sections of reroutes on the northern end of the Bucking Mule National Recreation Trail continued. These reroutes will reduce steep trail grades, eliminate safety concerns, and reduce maintenance. Work is approximately 80% done and will wrap up during the 2005 field season. A re-construction project was developed for the lower end of the Bench Trail in cooperation with the Montana Conservation Corps and local mountain bike clubs. NEPA is scheduled for 2005 even though funding for this project from the State Recreation Trails Program did not materialize. Volunteers accomplished approximately 42 miles of light trail maintenance on the Medicine Wheel-Paintrock RD.

Deterioration of the Forest trail system bridges continues and is at a critical stage with several nonstandard bridges collapsing in recent years (discussed in the FY96 Trail and Trail Bridge Accomplishment Report). In 2004, the Forest completed 21 trail bridge inspections. It is anticipated that by the end of the 2005 field season, all scheduled bridge inspections will be completed forestwide for the 5-year period.

Monitoring Requirement 7: Law enforcement

2004 continued a trend of increased off-highway vehicle-related law enforcement incidents compared to recent years. At least half of all law enforcement time was spent dealing with OHV issues (e.g., education efforts or other public outreach, enforcement activities).

The number of offense actions by law enforcement personnel is primarily a function of the number of field personnel, so a meaningful statistic is the share of OHV-related offenses compared to total offenses. Motorized recreation-related offenses are the most frequently cited

category of law enforcement offenses on the Bighorn National Forest, accounting for 39% of total violations in 2004, up from 2003 (nearly 33%) and 2002 (24%).

VALIDATION MONITORING

Continued monitoring confirms views expressed in earlier monitoring reports. For clarity/understanding and readability the 2000 “Validation Monitoring” section is repeated.

“As the Forest moves forward with new planning efforts, some of the initial flaws in the current plan are being addressed. Previous concerns over use of Recreation Opportunity Spectrum (ROS) guidelines for management areas have been adjusted. Specifically, the building of roads in areas set aside to maintain Semi-Primitive Non-motorized experiences will be the exception in future planning. Changes will be available for public review in the upcoming Forest Plan Revision.”

FACILITIES

PROGRAM SUMMARY

The Forest Service infrastructure consists of those facilities required for the management of the National Forest. There are approximately 1,561 miles of classified, system road and 114 buildings along with associated structures and utilities utilized for resource management on the Bighorn National Forest.

Funding for maintenance of the infrastructure has never been adequate. As such, priorities have to be set as to what work will be accomplished and what will be deferred. As budgets have declined, the amount of deferred work, or backlog, has increased dramatically. Adding to this is the fact that the majority of our roads and buildings are at or near the end of their design life, and in many cases a more substantial investment than routine maintenance will be required.

In 1998, the Forest Service determined that more information was needed to accurately identify our maintenance needs. This additional information gathering was, and is, being done at the expense of actual maintenance activities.

In 2004, the Bighorn National Forest performed condition surveys on only about 3 miles of maintenance level 3, 4, and 5 roads (i.e., roads open for travel by passenger vehicles, with varying degree of user comfort), in an effort to estimate the maintenance backlog on these roads, as well as estimate the current annual maintenance and capital improvement needs of these roads. This was due to the fact that the majority of these roads scheduled for condition surveys were completed in 2003. In 2005, only another handful of roads are required to be surveyed to get all of the maintenance level 3, 4, and 5 roads completed.

In 2004, routine maintenance was performed on approximately 264 miles of road by force account crews and by permit holders according to the permit requirements. Work done on maintenance level 1 and 2 roads was done primarily on the Tongue district. Maintenance work on maintenance level 3, 4, and 5 roads was done over the entire forest. Since 1998, the Forest’s force account road crew has been on a 3 year rotation to cover the entire forest. This means that every year, the crew is located on a different district and will do maintenance (mainly on the level 2 roads) on that district only. This coincides with most level 2 road management objectives, of maintain to standard every 3 years. There was no maintenance contract for performing any work in 2004, as funding was short. One new trailhead was constructed (Jaws

TH) on the Medicine Wheel District for a length of 0.1 mile of new road. Two short segments of road were reconstructed on the Tongue District in an attempt to mitigate archaeological sites by plating over the sites (sheep creek area). There were no roads decommissioned in 2004. The cause for performing so little work in 2004 was a direct result of losing 2 members of the road crew to better paying jobs, and having trouble filling these positions. In addition, the remaining operators on the road crew were very inexperienced, and they didn't get much maintenance done.

In 2004 a contract began that would replace the majority of all regulatory and warning signs on approximately 52 miles of road on the north end of the forest. The contract is approximately ½ done, and will be finished in the spring of 2005.

In 2004 the crew that normally performs level 1 road maintenance (closed road monitoring) was used to inventory roads in the 'C' area, of Woodrock, in an attempt to get together a stewardship contract for harvesting timber, in exchange for decommissioning roads. As a result, maintenance was only done on approximately 15 miles of level 1 roads.

In 2004, there were approximately 16 road bridges that were inspected, as required by the Federal Highway Administration (FHWA), and by the FSM. One new bridge was reconstructed, replacing a structurally deficient bridge on FSR 189, Hunter Summer Home Group. In addition, numerous bridge decks were cleaned, in addition to upgrading existing regulatory warning signage around bridges.

Inspections were performed on 16 different administrative buildings during the 2004 fiscal year. These inspections were done in an attempt to find deferred maintenance items on these facilities, and to determine their annual maintenance costs. Routine maintenance and emergency repairs were performed on various buildings across the Forest. Approximately 2 sanitary surveys were performed in 2004 on existing administrative water systems, and 10 sanitary surveys on existing recreational water systems. Water system enhancements were made via force account 2 different water systems, including constructing new well pads and installing new hand pumps. In addition, 1 new water line was replaced (approximately 800' of water line-Burgess RS). Technical support was also provided in the areas of special uses, interdisciplinary teams, accessibility, safety, and resource issues as required.

IMPLEMENTATION MONITORING

Construction, reconstruction, and maintenance projects are monitored to ensure compliance with applicable laws, regulations, plans and specifications. Coordination with specialists during project planning is accomplished to ensure health, safety, and resource protection measures are incorporated into the projects as required.

Monitoring Requirement: Arterial, collector, and local road construction and reconstruction

Road construction and reconstruction Standards and Guidelines are met by utilizing design criteria developed through an interdisciplinary process and approved by the line officer.

EFFECTIVENESS MONITORING

During project implementation, qualified personnel conduct monitoring through onsite inspections. Deviations from the planned design are accomplished as necessary to account for a

change in conditions or a plan oversight. Input from other specialists is sought as conditions warrant. Final acceptance of contracted projects by the appropriate authority is required.

VALIDATION MONITORING

Personnel monitor construction projects during the performance of their routine duties. Changes in future design or modification of maintenance activities are incorporated as necessary to meet management objectives.

Wilderness

PROGRAM SUMMARY

One seasonal Wilderness Ranger was funded for the field season of 2004 from Recreation dollars. This is the first year since 1994 that seasonal ranger staffing has been less than four seasonal employees. One other seasonal funded by Trails funds worked 45 days in wilderness. The two seasonals continued typical monitoring such as mandatory registration compliance, minor trail clearing, and enforcement of Cloud Peak Wilderness regulations. Due to fewer Wilderness Rangers, this work was at less than half the amount done in previous years.

Monitoring Requirement 1: Condition of use areas

No monitoring for campsite conditions conducted in 2004. Next planned monitoring is in 2005.

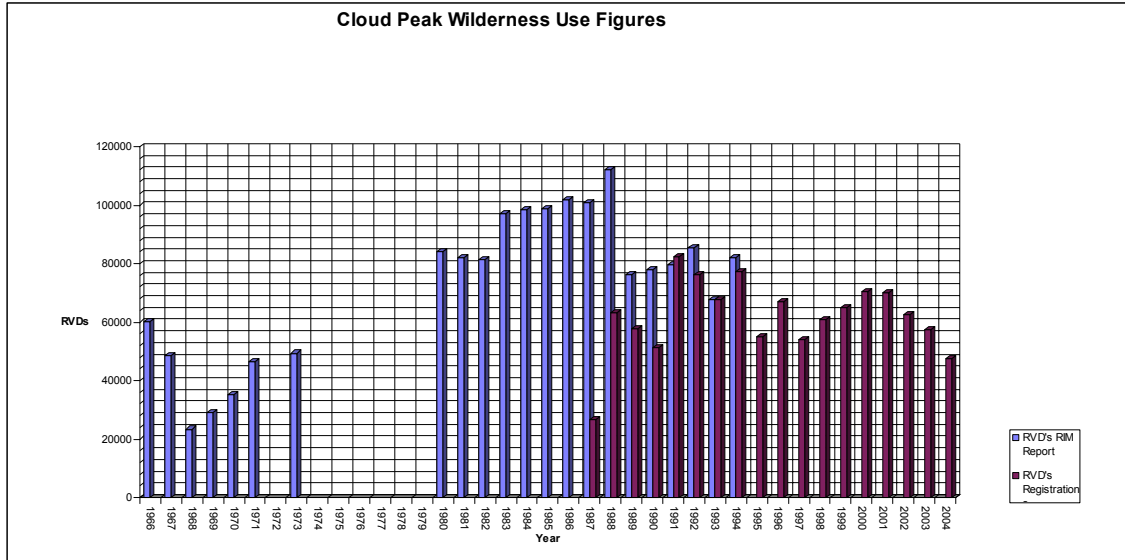
Monitoring Requirement 2: Amount and distribution of wilderness use

Recreation Visitor Days estimated at 47,500. The estimate of RVDs is based on required registration. Due to the ease of access to Cloud Peak Wilderness trailheads from U.S. 16 over 80% of the visitors enter the Wilderness from the south trailheads.

EFFECTIVENESS MONITORING

The campsite monitoring for amount of bare ground conducted every 5 years appears to be adequate to establish the trend in campsite conditions.

Figure 7. Wilderness use figures for the Cloud Peak Wilderness, Bighorn National Forest.



VALIDATION MONITORING

New standards and guidelines established by the Forest Plan Amendment (1998) have been implemented and more effectively show use and resource impact trends.

RECOMMENDATIONS

The following recommendations have been made by individual specialists and/or the staff officer for that resource. The disposition column indicates the Forest Supervisor’s planned action on whether to adopt the recommendation, defer it for some future time, or consider otherwise as described. Although every effort will be made to implement the adopted recommendations, some may not be accomplished due to changing future priorities.

Recommendation	Disposition	Track ⁵
Facilities		
1. Emphasize maintaining the portions of existing infrastructure needed for long term Forest management.	We will do this.	Yes
2. Shift maintenance responsibilities to permittees and other users where appropriate.	We will do this.	Yes

⁵ This item will continue to be tracked in the next annual monitoring report.

Recommendation	Disposition	Track ⁵
Forest Vegetation		
1. Update silviculture standards and guidelines to those previously listed in the Regional Guide for regeneration, size of created openings, size of uncut areas between created openings, when a created opening will no longer be considered an opening, guidelines that provide direction for the use of landscape level management, and guidance for applying silviculture systems to the landscape.	The Regional Guide has been discontinued. The silvicultural standards and guidelines will be updated in the Revised Forest Plan.	Yes
2. Review the projected mortality volume estimates from the 1985 Forest Plan. Current output is 187% of projected amount. A determination should be made to see if by exceeding this output we are doing so at the detriment of other resource objectives, or if the projections were inaccurate.	This is being done currently through the effects analysis in forest plan revision.	Yes
3. Review standards and guidelines and document forestwide interpretation so they can be applied consistently and in consort with objectives and outputs adjusted accordingly.	This is being done through forest plan revision. We will not do this for the 1985 plan which is in the 19 th year of implementation.	Yes
Lands and Special Uses		
1. Develop a self-monitoring inspection system for all special uses.	We intend on start implementing this in FY 2005.	Yes
Heritage Resources		
1. Amend the 1985 Forest Plan to address changes necessary in the management of the heritage resource. Include more specific statements in the “General Direction” and “Standards and Guidelines” sections of the Plan relating to existing laws and procedures. The Forest Plan should reflect a 1988 Amendment to the Archaeological Resource Protection Act, Section 14(b) that requires the preparation of a schedule for surveying lands that are likely to contain the most scientifically valuable archaeological resources.	This is being addressed in forest plan revision. The existing and revised forest plans include, by reference, all applicable laws. We will manage the Bighorn National Forest in accordance with those laws. (This recommendation was originally made in the 2002 monitoring report, and the Draft Revised Plan was updated to achieve this recommendation.)	Yes

	Recommendation	Disposition	Track⁵
2.	Ensure that aerial spraying to control pests and noxious weeds is conducted with protective measures in areas containing petroglyphs and pictographs, or in un-inventoried areas containing rock outcrops, cliff faces, or rock overhangs. Recent advances in analytical techniques allow for the dating of petroglyphs and pictographs through sensitive chemical ratios.	A forestwide guideline to this effect was supposed to be added to the draft Revised Forest Plan, but was overlooked. A guideline that protects these resources is included in the final Revised Plan.	Yes
3.	Incorporate a paleontological resource management program.	The draft Revised Forest Plan goals, objectives, standards, and guidelines include direction for paleontological resources. The Bighorn National Forest will continue to manage this resource for protection for the foreseeable future, rather than engage in an active management program.	Yes
4.	Enter into an agreement with the Wyoming State Historic Preservation Office that deals with the acceptance of impacts to all but the best examples of resource types (e.g., the best tie-hack cabins; the best teepee ring sites). The end result of the agreement would be a reduction in costs.	There is interagency work being done on this potential Memorandum of Understanding (MOU).	Yes
6.	Incorporate direction to cover all pertinent laws, such as Native American Graves and Repatriation Act, and Preservation of Historical and Archeological Data, as well as other federal direction that carries the weight of law, such as Executive Order 13007 (the 1985 Forest Plan emphasizes the management of Heritage Resources in relationship to Section 106, of the National Historic Preservation Act).	The Bighorn National Forest has, and will continue to, follow the National Historic Preservation Act. The draft Revised Forest Plan includes additional direction compared to the 1985 Forest Plan on this topic, as noted earlier in this monitoring report.	Yes
Insects and Disease			
1.	Change the monitoring requirement currently in the 1985 Forest Plan to reflect surveys every three years and spot surveys as needed, rather than the 800,000 acres each year.	The recommendation for monitoring requirement is included in the Draft Revised Forest Plan.	Yes

Recommendation	Disposition	Track ⁵	
Recreation			
1.	Adjust and clarify both capacity figures and ROS guidelines in the Forest Plan.	The Forest initiated a capacity study in FY 2004. ROS guidelines are being addressed in the draft Revised Forest Plan.	Yes
2.	Initiate an intensive education and law enforcement program of off-road vehicle use and dispersed camping. Consider the elimination of off-road vehicle areas (“C” areas on our Forest maps).	Education and law enforcement have been ongoing and will continue to be done. The draft Revised Forest Plan includes direction for eliminating “C” areas. Travel planning on the Powder River and Tongue Ranger Districts is being conducted to continue providing for motorized recreation in two of the affected “C” areas. A decision for the Powder River Ranger District project will be made in March of 2005.	Yes
3.	Develop strategies for collecting reliable recreation use statistics and in defining recreation resource assets.	Project prioritization will be set annually through project work planning which is based on multiple resource needs and resource availability.	Yes
4.	Apply land management prescriptions to larger blocks of land in future planning.	This recommendation has been adopted in the draft Revised Forest Plan and will be incorporated into the Final Plan which is anticipated to be completed in fall of 2005.	Yes
Soil and Water			
1.	Increase emphasis on monitoring of special use permits related to water conveyance systems, septic systems, and instream flows.	This has been done in the past and will continue to be done. The degree that this work is increased will depend upon annual project prioritization and work planning, which is based on multiple resource needs and resource availability.	Yes

Recommendation	Disposition	Track ⁵
Wildlife		
1.	For habitat improvement projects, focus priorities on achieving landscape scale improvements in big game winter range, aspen, or riparian areas.	This has been done in the recent past with prescribed burns such as the Little Horn and other efforts, and will continue.
2.	Focus future inventory efforts on invertebrate and mollusk species, for which very little information is known for the Forest.	With limited funding, this remains an opportunity for improvement.

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