MONITORING AND EVALUATION REPORT

FY 2005

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 2005. The Revised Forest Plan went into effect in December, 2005, with entirely new Monitoring items and protocols. The monitoring and evaluation section of the Revised Plan is based on findings and recommendations made in previous monitoring and evaluation reports and on the interdisciplinary team, cooperating agency, and public input. It incorporates current procedures, protocols, and the best available science.

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 — 09/28/2006

William T. Bass — Date

Forest Supervisor

Table of Contents

INTRODUCTION **1**
BACKGROUND 1
FIVE-YEAR MONITORING REQUIREMENTS 2
PLANNING ACTIVITIES 2
ACHIEVING OBJECTIVES OF THE FOREST PLAN 5
MONITORING RESULTS **6**
Physical Components *6*
Aquatics Program 6
Air Quality 6
Soils 6
Fish and Riparian 7
Fire 11
Biological Components *14*
Insects and Disease 14
Forested Vegetation and Timber 17
Rangeland Vegetation and Livestock Grazing 24
Invasive Species 27
Rare Plants 28
Wildlife 31
Social Components *44*
Heritage Resources 44
Lands and Special Uses 45
Recreation 45
Facilities 47
Wilderness 49
RECOMMENDATIONS **51**
REFERENCES **52**
LIST OF CONTRIBUTORS **53**
APPENDIX A – MONITORING TABLES FOR FIRE, RANGE, AND WILDLIFE

List of Figures and Tables

Figure 1. Reforestation, TSI, and release needs since 1990 18
Figure 2. Comparison of projected ASQ and output on the Bighorn National Forest from 1987 to 2005. 19
Figure 3. Reforestation and timber stand improvement acres on the Bighorn National Forest from 1986 to 2004. 20
Figure 4. Treated acres, by method, on the Bighorn National Forest from 1986 – 2005 21
Figure 5. Cloud Peak wilderness use by travel method in FY 2005. 49
Figure 6. Cloud Peak Wilderness use by trailhead in FY 2005. 50

Table 1. Current management area allocations on the Bighorn National Forest compared with those in the 1985 forest plan. 2
Table 2. Projected forest plan average annual outputs, costs and returns compared to actual FY 2005 accomplishments for wildlife and fisheries resources. 4

Table 3. Monitoring for aquatics, riparian, fisheries, and mineral resources in 2005 using Revised Plan monitoring measures. 7
Table 4. Resource projects supported by fire crews. 12
Table 5. Monitoring items for insects and disease using Revised Plan monitoring measures. 14
Table 6. Monitoring items for restoration of vegetative communities using Revised Plan monitoring measures. 17
Table 7. Review of activity and outputs. Projected outputs are from the 1985 Forest Plan. 21
Table 8. Monitoring items for stewardship contracting and wood product outputs using Revised Plan monitoring measures. 23
Table 9. Monitoring results for rangeland vegetation and livestock grazing using the Revised Plan monitoring measures. 24
Table 10. Monitoring results for invasive species using the Revised Plan monitoring measures. 27
Table 11. Acres of noxious weeds and acres treated on the Bighorn National Forest in 2005. 28
Table 12. FY 2005 sensitive species and species of local concern on the Bighorn National Forest. 29
Table 13. Dates of last observations of all documented Bighorn National Forest sensitive species and species of local concern. 30
Table 14. Elk populations and objectives by herd unit on the Bighorn National Forest. 35
Table 15. Potential and existing elk security in geographic areas (2002). 35
Table 16. HABCAP values for red squirrel and red-breasted nuthatch at the forestwide scale. 37
Table 17. Results of avian/squirrel monitoring conducted by RMBO on Bighorn National Forest, 2002 - 2004. 38
Table 18. Breeding bird survey population trends for red-breasted nuthatch on Bighorn National Forest. 38
Table 19. Results of Brewer's sparrow monitoring conducted by RMBO on Bighorn National Forrest. . 39
Table 20. Breeding bird survey population trends for Brewer's sparrow on Bighorn National Forest. 39
Table 21. Number and acres of aspen exclosures maintained on the Bighorn National Forest in 2005. 41
Table 22. Number and acres willow/riparian exclosures on the Bighorn National Forest in 2005. 42
Table 23. Heritage resources monitoring on the Bighorn National Forest in FY05 using Revised Plan monitoring measures. 44
Table 24. Lands and special uses monitoring on the Bighorn National Forest in FY05. 45
Table 25. Recreation monitoring on the Bighorn National Forest in FY05. 46
Table 26. Wilderness use monitoring for FY05 using Revised Plan monitoring measures. 49

List of Appendix A Tables

Table A-1. Fire reports – Bighorn National Forest FY 2005 wildfires. A-1

Table A-2. Noxious weed occurrences and treatments in FY 2005 using the Revised Plan monitoring measures. A-2
Table A-3. Aspen treatments on Bighorn National Forest, FY2005..... A-3
Table A-4. Aspen exclosures maintained on the Medicine Wheel-Paintrock District in FY 2005. ..... A-4
Table A-5. Aspen exclosures maintained on the Tongue District in FY 2005. ..... A-4
Table A-6. Aspen exclosures maintained on the Powder River District in FY 2005. ..... A-4
Table A-7. Willow/riparian exclosures maintained on the Medicine Wheel-Paintrock District in FY 2005..... A-5
Table A-8. Riparian exclosures maintained on the Tongue District in FY 2005..... A-5
Table A-9. Riparian exclosures maintained on the Powder River District in FY 2005. ..... A-6
Table A-10. Winter range/upland exclosures maintained on the Medicine Wheel-Paintrock District in FY 2005..... A-6
Table A-11. Prescribed burns on Bighorn National Forest in FY 2005..... A-7
Table A-12. Bighorn National Forest partner contributions in FY 2005. ..... A-7

INTRODUCTION

An annual Monitoring and Evaluation Report is to be prepared for each forest plan. 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.

The Monitoring and Evaluation Report 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.

The 2005 Monitoring and Evaluation Report for the Bighorn National Forest includes direction from two forest plans: the 1985 Forest Plan and the Revised Forest Plan which was approved on September 30, 2005. Both plans were developed based on, among other things, a comprehensive public notification, and comment process. Both are accompanied by an Environmental Impact Statement and Record of Decision. Because this is a 'transition year' from a monitoring standpoint, monitoring aspects from both the 1985 and Revised Forest Plans will be included in this report.

The forest plans established direction and process so all future decisions include an interdisciplinary approach to achieve integrated resource management. The plans provide direction to coordinate multiple uses on the Bighorn National Forest on a sustained basis. They also fulfill legislative requirements and address local, regional, and national issues. Chapter 4 of both plans 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.

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 2005 was the 20th and final year of implementation for the 1985 Forest Plan. Specific items that would indicate a future revisions:

- 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

In 1999, the Bighorn National Forest published its Notice of Intent (NOI) to revise the 1985 Land and Resource Management Plan. The Draft Revised Plan and Draft Environmental Impact Statement were published and available for public review and comment in July 2004, and the Revised Forest Plan was approved in September 2005. Management area allocations between the two forest plans are compared in the following table.

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

	Management Areas	1985 Forest Plan Nearest Equivalent	1985 Plan Acres	Revised Plan Acres
1.11	Pristine Wilderness	Same – per Plan Amendment 14, 8/1/98	131,222	130,798
1.13	Wilderness, Semi-primitive	Same – per Plan Amendment 14, 8/1/98	60,676	61,100
1.2	Areas Recommended for Wilderness		0	33,857
1.31	Backcountry Recreation, Nonmotorized	3A Semi-primitive nonmotorized recreation. 3B Primitive Recreation	78,993	10,010
1.32	Backcountry Recreation, Nonmotorized Summer with Limited Winter Motorized	3A Semi-primitive nonmotorized recreation. 3B Primitive Recreation		59,937

	Management Areas	1985 Forest Plan Nearest Equivalent	1985 Plan Acres	Revised Plan Acres
1.33	Backcountry Recreation with Limited Summer and Winter Motorized Use			7,244
1.5	National River System-Wild Rivers	10D Wild and Scenic River Corridors	13,217	15,632
2.1	Special Interest Areas (outside Wilderness)		0	0
2.2	Research Natural Areas (outside Wilderness)	10A Research Natural Areas	1,618	6,574
3.1	Special Interest Area, Medicine Wheel	10C Special Area	150	0
3.24	Riparian and Aquatic Ecosystem Management	9A Riparian and Aquatic Ecosystem Management	931	0
3.31	Backcountry Recreation, Year-round Motorized	2A Semi-primitive Motorized Recreation	25,455	66,679
3.4	National River System - Scenic Rivers (outside Wilderness)	10D Wild and Scenic River Corridors	17,110	6,188
3.5	Plant and Wildlife Habitat Management	4B Wildlife Management Indicator Species (unsuited timber)	148,064	88,585
4.2	Scenery	2B Rural/Roaded Natural Recreation	19,147	83,591
4.3	Dispersed Recreation		0	25,443
4.4	Recreation Rivers	10D Wild and Scenic River Corridors	0	3,457
5.11	General Forest and Rangelands – Forest Veg. Emphasis	4B Wildlife Management Indicator Species (suited timber)	88,206	80,049
5.12	General Forest and Rangelands – Rangeland Veg. Emphasis	6A Livestock Grazing Improve Forage Composition 6B Livestock Grazing Maintain Forage Composition	263,298	149,226
5.13	Forest Products	7E Wood Fiber Production	210,217	112,693
5.13.1	Forest Products, RACR 4(b) exceptions		0	0
5.21	Increase Water Yield, Vegetative Management	9B Increase Water Yield, Vegetative Management	3,991	0
5.4	Plant and Wildlife Habitat			59,275
5.41	Deer and Elk Winter Range	5A Non-forested Wildlife Winter Range 5B Forested Wildlife Winter Range	28,037	34,865

	Management Areas	1985 Forest Plan Nearest Equivalent	1985 Plan Acres	Revised Plan Acres
5.5	Dispersed Recreation and Forest Products			47,961
8.21	Water Impoundment – Twin Lakes, Tie Hack	9E Water Impoundment – Twin Lakes, Tie Hack		0
8.22	Ski-based Resorts: Existing/Potential	1B Winter Sports Sites	1,217	990
		1A Developed Recreation Sites	0	0
		4D Aspen Stand Management	13,368	0
		10C Preacher Rock Bog	0	0
MW	Medicine Wheel HPP	10C Special Area		20,863
	Total		1,104,981	1,105,017

Forest Plan Projected vs. Actual Outputs

The following table compares projected forest plan average annual outputs, costs, and returns to actual fiscal year (FY) 2005 accomplishments for those resources which reported monitoring under the 1985 Forest Plan. 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 2005 accomplishments for wildlife and fisheries resources.

Activity	Unit of Measure	2001-2010 Avg. Annual Projected Outputs	FY 2005 Outputs
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	200
Changes in Habitat Capability of Indicator Species			~
Early Successional Stage	% change (mean of 8 species)	Not estimated	~
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	1

Activity	Unit of Measure	2001-2010 Avg. Annual Projected Outputs	FY 2005 Outputs
Wildlife Structures	Structures constructed annually	15	50
Threatened and/or Endangered Species Habitat Management	Number of animals	0	2

Achieving Objectives of the Forest Plan

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 1985 forest plan. Moreover, the dollars are usually not adequately distributed to meet the needs for individual program areas. While budget trends and projections were considered in revising the Forest Plan, our assumptions were:

- In general, funding will be flat, or at best, keep up with inflation.
- Priorities and budgets will change, so specific output levels projected in the Revised Plan may or may not be achieved.
- The Revised Plan was developed under the principles of adaptive management. As budgets and priorities change, and we learn new science and best management practices, the Bighorn National Forest outputs will change over time. The monitoring and evaluation report will be one mechanism of informing people about actual accomplishments.

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 made 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% of the annual budget. The remaining 30% 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.

MONITORING RESULTS

PHYSICAL COMPONENTS

Aquatics Program

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.

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.

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,

[1] http://www.wyvisnet.com/gallery/CLPE/start.htm

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.

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.

Table 3. Monitoring for aquatics, riparian, fisheries, and mineral resources in 2005 using Revised Plan monitoring measures.

Monitoring Driver		Monitoring Question	Potential monitoring item
1.	NFMA; Multiple Goals, Objectives, Strategies	Are projects being implemented according to Revised Plan direction? This includes both planned actions and actual implementation.	This was not done in FY 2005. This is a requirement of the Revised Plan.
2.	Objective 2a, Strategy 8 Objective 4c, Strategy 4	How well is the Forest interacting and planning in cooperation with communities and local governments?	The Aquatics Program assists with the funding of stream gauging stations in Coney Creek. This is a coordinated effort with USGS and Sheridan Area Water Supply Joint Powers Board. The Aquatics Program was present at all revised forest plan Steering Committee meetings and open houses. The Aquatics Program attended one meeting of, and provided input into, the Washakie Watershed Steering Committee.

Monitoring Driver		Monitoring Question	Potential monitoring item
5.	Objective 1a Strategy 1	Is water quality on the Forest being maintained according to state water quality standards?	Two stream segments on the Bighorn National Forest are on the Wyoming 303(d) list of impaired waters: the North Tongue upstream of the confluence of Bull Creek an unspecified distance and Granite Creek upstream from its confluence with Shell Creek approximately 4 miles to a point near Antelope Butte Ski area. ♦ Water quality was monitored using *E. coli* as an indicator of water quality in both waters. North Tongue was monitored at five sites weekly from June to November. Granite Creek was monitored monthly year-round. ♦ A watershed group has been formed for the North Tongue, and a watershed plan was initiated in 2005. The Aquatics Program is an active member of this group and will continue to be in the future. ♦ No actions have been taken in Granite Creek other than to monitor water quality monthly. Antelope Butte Ski Area was not in operation in 2004 and 2005, and listing may no longer be required.
6.	Objective 1a Strategy 2	Were watershed improvement projects completed?	The Aquatics Program was not directly responsible for any watershed improvements in 2005. However, personnel worked with Engineering personnel to develop and prioritize culvert replacements and general road maintenance.
7.	Objective 1a Strategy 3	Was the revegetation guidebook completed?	This was not completed in 2005.
8.	Objective 1a Strategies 4 – 7	Are aquatic habitat conditions being maintained for native plant, invertebrate and vertebrate riparian-dependent species?	Thirteen sites (nine new, four established) were surveyed across the forest in 2005. Eight of the new sites were established in separate 6th level watersheds as part of forestwide monitoring of aquatic and riparian habitat. The remaining sites (1 new, 4 old) were surveyed as part of project level monitoring. Site surveys included 3 to 4 cross-sections, a longitudinal profile, a pebble count, measurement of 50 widths & depths, and a green-line survey. A total of 1.23 miles of stream was surveyed (longitudinal profile length) at 11 of the 13 sites. A

Monitoring Driver		Monitoring Question	Potential monitoring item
			detailed summary of the survey will be completed every five years as identified in the Revised Forest Plan. ♦ The Aquatics Program funded the survey and design of a stream restoration project in the South Tongue River. No implementation occurred in 2005. ♦ The Aquatics Program was not directly responsible for any measurable watershed improvements in 2005. However, personnel worked with Engineering to develop and prioritize culvert replacements and general road maintenance.
9.	NFMA Species Viability Objective 1b Strategies 1 – 5	Is the Bighorn National Forest providing the ecological conditions to sustain viable populations of native and desired non-native species and to achieve objectives for Management Indicator Species (MIS)?	Implementation of standards and guidelines in the Revised Forest Plan will provide ecological conditions to sustain viable populations of rainbow trout (MIS), Yellowstone cutthroat trout (R2 Sensitive Species), mountain sucker (R2 Sensitive Species), or non-native desirable/demand species. No conservation strategies were developed for these species.
10.	NFMA Species Viability Objective 1b, Strategies 5-11	Are the habitat trends (and therefore population trends by inference) for MIS and other emphasis species being maintained or improved with respect to management activities conducted?	♦ Thirteen sites (nine new, four established) were surveyed across the forest in 2005. All sites will contribute to forestwide habitat condition and trend monitoring. Detailed results of habitat parameters monitored will be reported every 5 years as identified in the Revised Forest Plan. ♦ Electrofishing was conducted in cooperation with Wyoming Game and Fish Department (WGFD) at eight sites. These results will be presented in the 5-year report for this monitoring item. ♦ No expansions in Yellowstone cutthroat trout range occurred in 2005. Work was conducted in cooperation with the WGFD to determine feasibility of expanding range in Dry Medicine Lodge Creek and Porcupine Creek. WGFD will be the lead agency on these projects, and Bighorn National Forest personnel will assist. These projects will utilize toxicant to remove non-

Monitoring Driver		Monitoring Question	Potential monitoring item
			native trout species, but the specifics of these projects have not been finalized.
28B.	Objective 2c Mineral and Energy Resources Strategy 1	Are the effects of mining activities on surface resources consistent with Revised Plan expectations, as allowed in approved Plans of Operations?	♦ Plan of Operations for Pascalite Inc. were in compliance (Powder River Ranger District). ♦ One potential trespass (Powder River Ranger District) investigation is ongoing. ♦ 56 permits were issued for mineral materials and all were in compliance with the Revised Forest Plan.
40.	Objective 1a, Strategy 1	Are Best Management Practices (BMPs) effective in meeting water quality standards?	♦ Site visits to Bald Mountain Salvage occurred in 2005 and operator activities were consistent with the 1985 Forest Plan. ♦ Adjustments in the distribution of livestock along the North Tongue River lowered the relative concentration of *E. coli*, compared to data from 2004, but those lower concentrations still exceeded State water quality standards for bacteria.
41.	Objective 1b Strategy 2	Have management strategies (goals, objectives, standards, guidelines) resulted in an improved status for species at-risk and MIS?	The reporting frequency for this driver is every 10 years. Twenty-one sites were visited in 2005. Habitat condition information was recorded at 13 sites, and population information was recorded at 8 sites.
42.	Objective 1a	Are the standards and guidelines effective in meeting regional soil quality standards?	Site-specific monitoring of soil conditions was not conducted in 2005.
43.	Objective 1a, Strategy 4	Are fisheries and riparian standards and guidelines effective in maintaining or improving fish habitat or do they need to be revised?	This is the first year of data collection for this monitoring driver. Thirteen sites (nine new, four established) were surveyed across the forest in 2005. A total of 1.23 miles of stream was surveyed (longitudinal profile length) at 11 of the 13 sites. The Revised Forest Plan indicates that stream segments will be monitored before activity and again 5 years after. In many cases, monitoring prior to activity will not be possible. For example livestock grazing has occurred on the forest for over 100 years. It will not be possible to obtain pre-grazing data in the majority of streams and riparian areas. As an alternative to pre-activity monitoring, sites with minimal grazing (specific sites in wilderness streams,

Monitoring Driver		Monitoring Question	Potential monitoring item
			riparian/stream exclosures, etc.) are being identified and surveyed. These sites are scheduled to be surveyed on a 3- to 5-year rotation.
46.	Objective 2c Livestock Grazing Strategies 1, 2	Are livestock grazing standards and guidelines effective in meeting or moving toward desired conditions in riparian and upland rangeland vegetation sites?	This is a validation monitoring requirement included in the Revised Plan to be reported every 10 years. The forest will collect desired condition trend information, and conduct Best Management Practice and implementation reviews, in order to answer this question.

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 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. In line with the rest of the Rocky Mountain Region, the Forest upgraded Engine Module Leaders, Hand Crew Leaders, Assistant Engine Module Leaders, and Assistant Hand Crew Leaders. The purpose of upgrading these positions was to grade individuals at the level of responsibility in which they are performing and to help in retention of highly qualified individuals through remaining competitive with other Forests in regard to pay. The tours of all station leader positions are 18/8 which allows employee work seasons to overlap fire season with the prescribed burning seasons that occur on the shoulders of the normal fire season.

The Forest in conjunction with Worland BLM Field Office, Cody BLM Field Office, Wind River Agency BIA, Bighorn Canyon NRA, and the Shoshone NF began work on the Preparedness Module of Fire Program Analysis (FPA) which will replace NFMAS as the tool for developing budget levels in fire.

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. Filling vacancies of fire positions on the Forest is in accordance with IFPM standards.

Radio communication continued to be an issue on the Forest, specifically reliability of the system. Portable repeaters were used to improve radio communication with some incidents. Improvements continue to be made to the Catalyst Radio Control Over Internet Protocol. This system has been in use since July 2004, (on the Bighorn and Shoshone National Forests).

Communications technicians are working with software manufactures to resolve several bugs that have been identified. Although there continue to be bugs in the system, the overall quality and reliability has improved. There are still some issues and concerns with the system in Cody Interagency Dispatch Center (CDC) that will require further work and that process is on-going. Two satellites 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. Once again, wind damaged solar panels and lightning incapacitated the wind generator on Black Mountain which caused repeater batteries to run down, thus shutting down the Black Mountain repeater. The short-term fix for this was for fire crews to change out dry cell batteries on a regular basis until charging systems could be repaired. Repairs were made during the summer and Black Mountain repeater has been on-line without interruption since the repairs.

There are currently five Remote Automated Weather Stations (RAWS) on the Forest which all can be accessed via Internet to obtain current weather observations.

Table 4. Resource projects supported by fire crews.

Activity	Location(s)	Purpose
Hazard tree removal	Various Forest campgrounds Along roadways and powerlines	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
Conifer removal from aspen stands	Forestwide	Retain aspen stands

Implementation Monitoring

1985 Plan Monitoring Requirement—Meet Air Quality Standards for Prescribed Burning

Compliance with federal and state air quality standards is adhered to during prescribed fire projects. Prior to burn project implementation, the Forest Supervisor reviews and approves a prescribed fire plan. On January 1, 2005, new regulations for smoke management in the state of Wyoming became effective. These regulations are found in Chapter 10, Smoke Management, of Wyoming Air Quality Standards and Regulations. For 2005, the Bighorn National Forest complied with all the provisions of these standards that apply to fire and fuels projects on federal lands. In January, the Forest submitted a Long-term Planning Form which identifies planned fuels projects for the next 3 years, registered all fuels projects, and complied with all required notification, monitoring, and reporting as fuels projects were implemented. Monitoring of smoke conditions during burn project implementation includes smoke dispersal and wind direction to ensure compliance.

1985 Plan Monitoring Requirement 2: Fire control objective

Energy Release Component (ERC) at all RAWS was generally average to slightly above historical Forest averages through most of the 2005 fire season, however, late in the season ERCs exceeded the 90th percentile and reached the 97th percentile during the month of September due to uncharacteristically warm and dry conditions. For most of the season, 1,000-hour fuel moistures at all RAWS were generally near historical Forest averages.

Fire occurrence for 2005 was slightly above average, with 26 fires. These fires involved less than 50 total acres of National Forest System (NFS) lands; most were less than 1 acre. Fifty-eight percent of these fires were caused by lightning; 42% were human-caused. For more detailed information, see Table A-1 in Appendix A.

Bighorn National Forest fire crews provided initial attack support on Bighorn Canyon National Recreation Area lands and on adjacent Bureau of Land Management lands. Several members of the East and West Zone fire crews were utilized to fill out the Wyoming Interagency Hotshot Crew (IHC) on a rotating basis. In addition, the Bighorn provided one squad to each Bighorn Basin Type 2 IA Crew dispatched during the season. These continue to be excellent opportunities for employees to gain experience, while maintaining response capabilities and leadership coverage for the Forest.

In addition to crew activities, the Forest provided support to fires in other geographic areas by providing "single resources" (overhead). These employees (both full-time fire employees and employees who work in other resource areas) contributed to the national fire suppression effort by participating in large fire suppression across the western United States. Forest suppression resources also responded to the recovery efforts following Hurricane Katrina and Hurricane Rita.

Fire dangers on the Forest did not reach the level requiring the request for or use of severity funding to provide additional suppression resources at any time during 2005.

1985 Plan Monitoring Requirement 3: Fuel treatment of activity fuels

There were 1,648 acres treated with prescribed burning, pile burning, and mechanical treatments for fiscal year 2005. This included 1,218 acres in the wildland urban interface and 430 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 1,640 acres.

Specifically, fuels reduction (including thinning, hand piling, 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). Landing piles (activity fuels) were also burned in timber sale areas.

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 pine 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.

A Categorical Exclusion was prepared and signed for the Switchback hazardous fuels treatment project on the Tongue Ranger District. Work continued on the Southwest Fuels Environmental Assessment for hazardous fuels treatment with completion of the EA expected in early 2006.

Effectiveness Monitoring

The 1985 Forest Plan direction for fire management was very general. The standards and guidelines provided limited direction for fire management. The Fire Management Plan was revised to provide more specific fire management direction for suppression in the various management areas within the context of the 1985 Forest Plan. The forest plan revision was completed and Record of Decision signed in October, 2005. The revised plan provides more specific guidance to the fire and fuels program which will be incorporated into the Fire Management Plan for implementation.

Incident Commanders are required by policy to monitor the effectiveness of planned strategy and tactics on all incidents. Safety (firefighter and public) and cost effectiveness are primary considerations in all suppression actions on the Forest.

BIOLOGICAL COMPONENTS

Insects and Disease

The following monitoring items are from the Monitoring Strategy Table in Chapter 4 of the Revised Forest Plan. Narrative discussion of these monitoring items follows the table.

Table 5. Monitoring items for insects and disease using Revised Plan monitoring measures.

Monitoring Driver		Monitoring Question	Potential monitoring item
11.	Objective 1c Strategies 1 – 9	Is the Bighorn National Forest increasing the amount of vegetative communities restored to or maintained in a healthy condition with reduced risk and damage from fires, insects and diseases and invasive species?	Summary of control measures for insect/disease outbreaks in high value areas (acres treated) – see narrative below. Summarize insect/disease treatments, and compare to aerial inventory of insect/disease occurrences and extent to determine effectiveness – see narrative below.
44.	Objective 1c Strategy 6	Were the actions taken to minimize insect/disease epidemics effective?	From summary of treatments, compare to aerial inventory of insect/disease occurrences and the extent of them to

Monitoring Driver		Monitoring Question	Potential monitoring item
			determine effectiveness – see narrative below.

In 2005, the Forest and the Forest Health Management Service Center in Rapid City conducted ground surveys following up on the 2004 aerial survey. Results from those are summarized below.

General Trends

Ponderosa pine forests continue to see mortality from **mountain pine beetle** (*Dendroctonus ponderosae*) on the eastern edge of the Forest, but at lower rates than previous years. The Big Horn Mountains are still in a moisture deficit, but 2005 precipitation was above normal which may have contributed to lower mortality rates.

Treatment and/or salvage opportunities are limited due to poor access, steep slopes, poor quality wood, and adjacent private lands with infections that are generally untreated. To date only minimal personal use fuelwood collection adjacent to open highways has been accomplished.

Limber pine decline that was first reported in 1989 in Tensleep Canyon has progressed throughout the Forest at some level into most every limber pine stand. 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.

Silvicultural treatments to reduce mortality have very limited success and are very expensive with little or no economic return. To date, treatments consist of minimal personal use fuelwood collection, and collection of seed from phenotypic resistant trees. This seed is collected 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 continues to be evident on the Forest, and 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.

Because of the low commercial value of dead subalpine fir the only treatment or salvage that has been accomplished has been ancillary to other treatments.

The **spruce beetle** (*Dendroctonus rufipennis*) continues to be very active, especially in the upper reaches of many drainages between Highways 14 and 16 on the west side.

In 2005, the Bald Mountain Salvage Sale was sold and operations begun to pre-treat and salvage 250 acres of active spruce beetles to increase resistance of the residual stand. Two high-value areas, a campground and a permitted cabin, were included in this sale. However much of the active spruce beetle areas that are inaccessible and will go untreated.

Douglas-fir beetle (*Dendroctonus pseudotsugae*). Epidemic-sized populations are 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 Douglas-fir beetle epidemics are in progress in many other parts of Wyoming. The Forest offered the Bench Stewardship Contract in Shell Canyon to treat and salvage 852 acres. However, many other areas are remote or have limited salvage opportunities.

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. No treatments explicitly for Comandra blister rust were made in 2005, although some projects are including larger scale treatments to reduce the rust in regenerated 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. No treatments explicitly for mistletoe were made in 2005, although some projects are including larger scale treatments to reduce mistletoe in regenerated stands.

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.

Timely commercial harvest, such as the work done in the Cold Springs area in 2005 is one tool to increase resistance of the residual stand of trees while salvaging economic benefit from the wood fiber.

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

1985 Forest Plan 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 and are not schedule again until 2007.

1985 Forest Plan 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, PTSAR[2], STARS[3], and TIM[4] reports, and planned accomplished records in the Forest RMACT[5]/FACTS[6] database.

Table 6. Monitoring items for restoration of vegetative communities using Revised Plan monitoring measures.

Monitoring Driver		Monitoring Question	Potential Monitoring Items
11.	Objective 1c Strategies 1 – 9	Is the Bighorn National Forest increasing the amount of vegetative communities restored to or maintained in a healthy condition with reduced risk and damage from fires, insects and diseases and invasive species?	Table 7 displays acres treated, 1985 Forest Plan projected outputs, and differences between accomplishments and projections. Vegetation treatment unit layout in recent years has included larger treatments designed to emulate the scale of natural events.

Implementation Monitoring

1985 Plan Monitoring Requirement 1: Clearcut harvest unit size

Silvicultural prescriptions, contract design plans, contract maps, and on-the-ground layout of contracts were reviewed for compliance with the maximum size limits; the Forest offered no timber sale clearcut units greater than 40 acres. One NEPA decision, the Woodrock project, called for clearcuts greater than 40 acres to emulate the natural scale of created openings, and the Regional Forester granted approval for them.

1985 Plan Monitoring Requirement 2: Assure regeneration within allowable time frames of final harvest

In FY 2005, the Forest surveyed 1,746 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 the ongoing drought have reduced some survival.

Qualitative surveys of recent wildfires were not accomplished in 2005; however, some are scheduled for survey in 2006.

[2] Periodic Timber Sale Accounting Report (PSTAR)

[3] Sale Tracking and Accomplishment Report (STAR)

[4] Timber Information Manager (TIM)

[5] Rocky Mountain Activities (RMACT)

[6] Forest Activities Tracking System (FACTS)

1985 Plan Monitoring Requirement 3: Assure reforestation and TSI treatments are current and no backlog is created

Four hundred and fifty two acres of TSI treatments were accomplished in 2005. The reforestation data reflects an accurate assessment of our needs, and some work was done towards validating the TSI and release needs section, but further work remains.

Currently, we are at 115% 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 FACTS shows 2,026 acres needing reforestation up from 1,478 acres last year. This change is due to subtracting those acres of regeneration treatments (planting) and adding those acres of past wildfires reported during the validation process to the needs database.

The FACTS database shows no change in the release needs (2,683) with no treatments or additions. The database shows 6,487 acres of Timber Stand Improvement (TSI) needs, down from 6,939 last year.

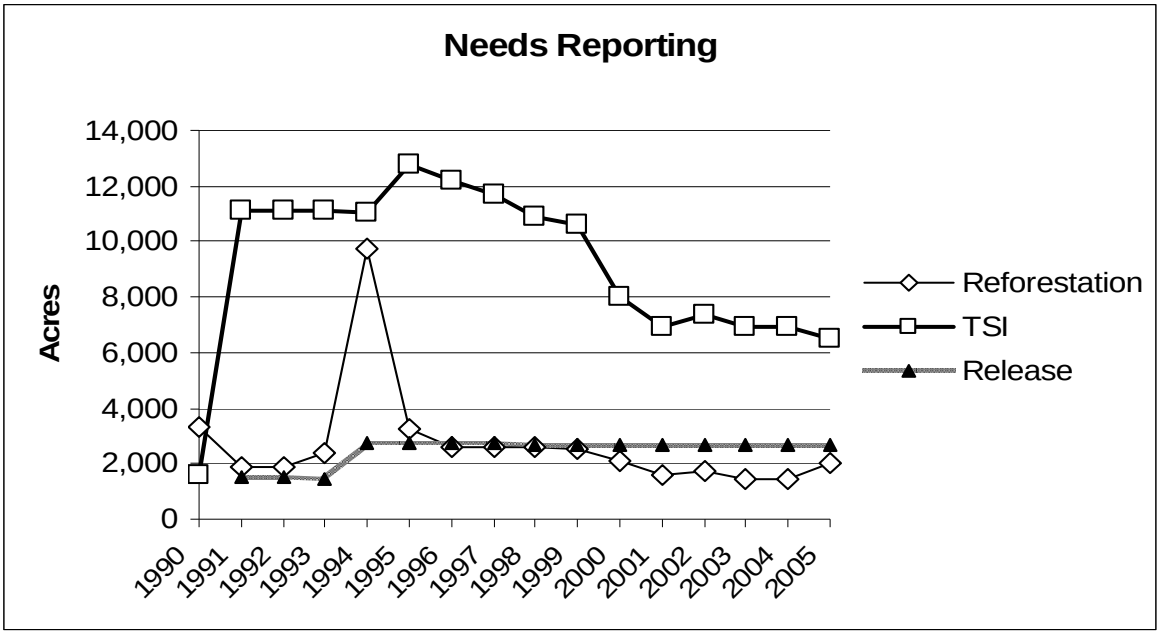

Figure 1. Reforestation, TSI, and release needs since 1990.

1985 Plan Monitoring Requirement 4: Compliance with schedule and outputs

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

The table of outputs for timber, see below, includes the volume offered and the acres thinned, reforested, and harvested by regeneration method. The 1985 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 2005, after twenty years of implementation, the Forest has offered 37.7 million cubic feet, MMCF (155.0 million board feet, MMBF), compared to a projected output of 84.5 MMCF (327.5 MMBF), or 47 percent of the projected ASQ output (46% last year). The acres offered for harvest by regeneration method are 39% of the projected acres. There are a number of reasons for this difference:

Given a choice between meeting the 1985 Forest Plan standards and guidelines and the outputs projected, the Forest has met or exceeded the 1985 standards and guidelines. This has produced lower than projected outputs.

- Funding levels for many programs are below the 1985 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 analysis prepared in 1993. This administrative cap has been removed with the 2005 Forest Plan Revision.

The following figure shows the difference between the 1985 Forest Plan projected allowable sale quantity (ASQ) and current outputs through FY 2005.

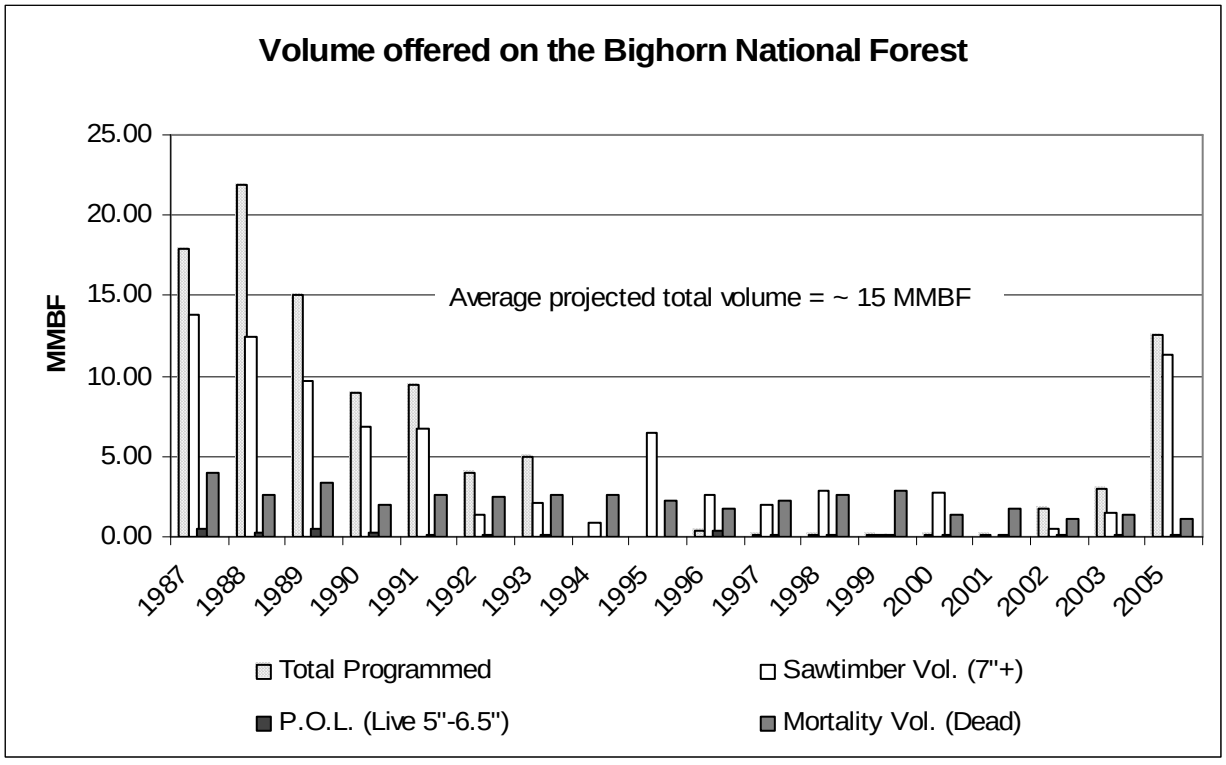

Figure 2. Comparison of projected ASQ and output on the Bighorn National Forest from 1987 to 2005.

The Ranger Districts saw a steady demand for fuelwood sales as prices for other sources of fuel increased. Comments from public fuelwood gatherers indicate is it becoming more difficult to

find easily accessible fuelwood. The cumulative removal continues to exceed 1985 Forest Plan projections (165%). Post and pole harvest remains stable, with healthy demand exceeding the Forests ability to offer. Teepee poles continue to be in high demand. The Forest completed 212 acres of tree planting (see following figure). Over the planning period, the Forest accomplished 69% of the projected amount of reforestation.

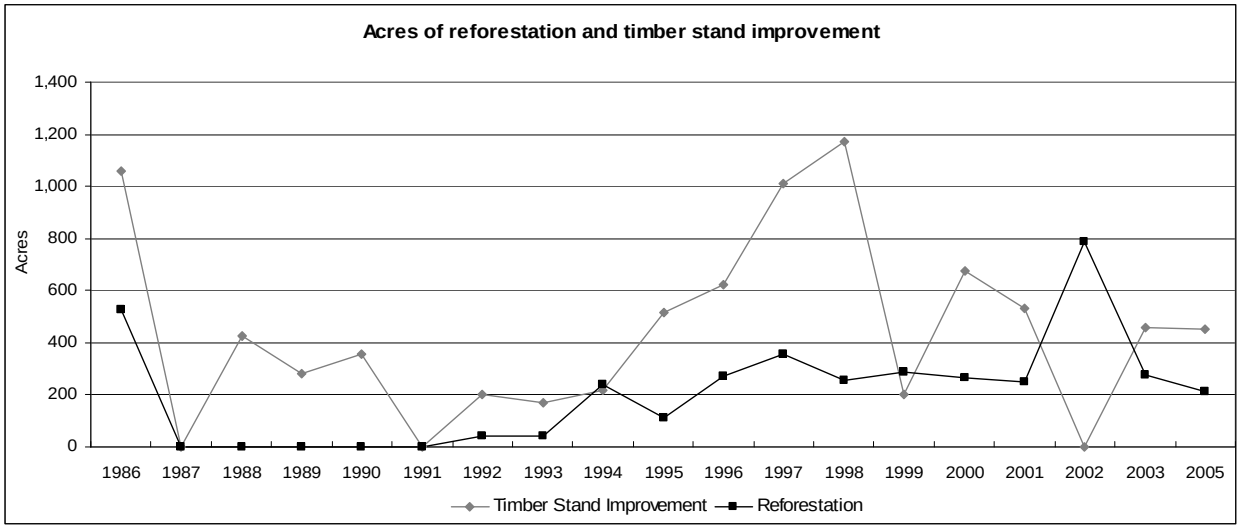

Figure 3. Reforestation and timber stand improvement acres on the Bighorn National Forest from 1986 to 2004.

1985 Forest Plan 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 1985 Forest monitoring plan. This analysis was completed during the 2005 forest plan revision.

1985 Forest Plan Effectiveness Monitoring

No effectiveness monitoring was conducted in FY2005.

1985 Forest Plan Validation Monitoring

The acres of treatment by method from the 1985 Forest Plan are displayed in the following figure and table. Since the 1985 Forest Plan was implemented, the Forest has not matched this projected mix or the projected wood fiber outputs. Total acres harvested are 39% of the total projected for the planning period, while reforestation acres are 69% of the projected output, and Sawtimber harvest is 32% 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 remain consistent.

This and past monitoring reports have cited that the Bighorn National Forest management area designations are too small in size and too numerous in a given watershed to manage for a dominant use on a watershed scale. The Revised Forest Plan (2005) includes larger management areas.

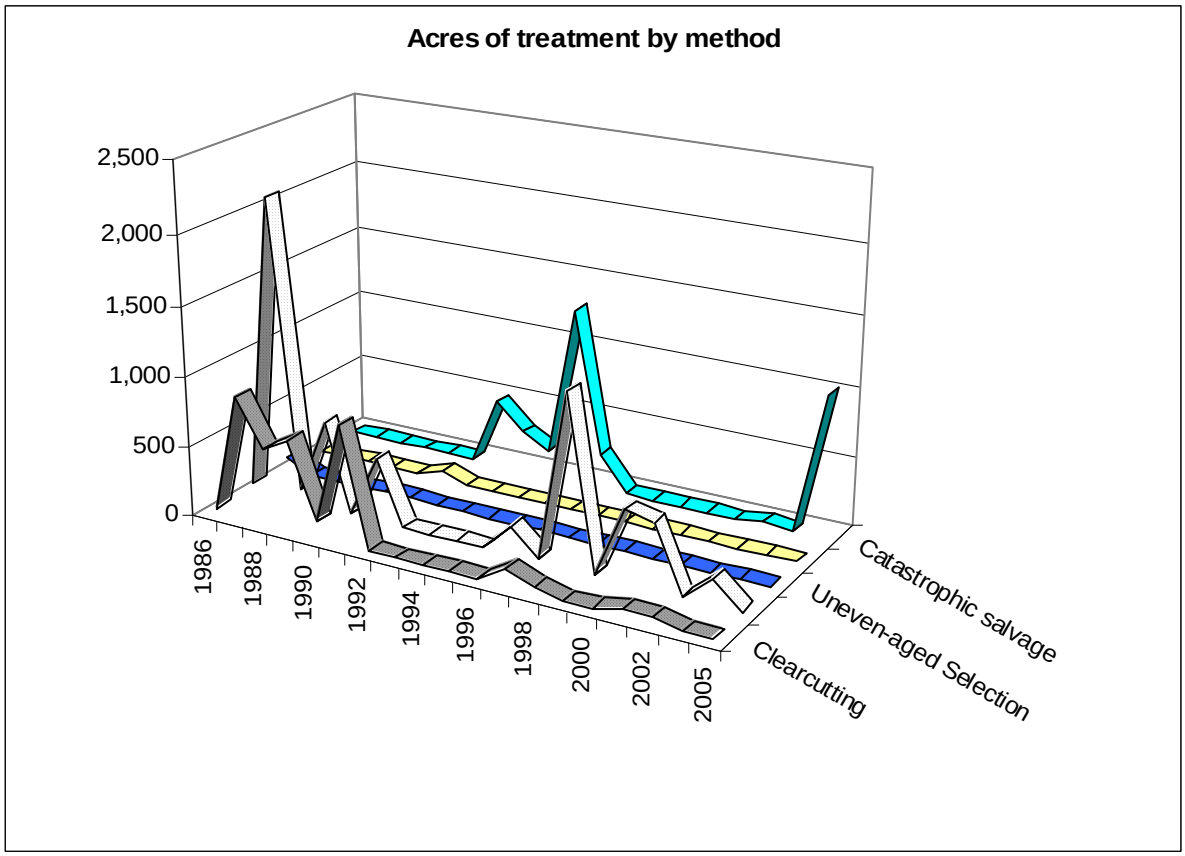

Figure 4. Treated acres, by method, on the Bighorn National Forest from 1986 – 2005.

Table 7. Review of activity and outputs. Projected outputs are from the 1985 Forest Plan.

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
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

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**
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
2005	12.59	2.48	11.34	2.22	0.16	0.04	1.09	0.22
Total Projected Output	327.5	84.5	290.0	76.0	10.0	1.6	27.5	7.3
Total Actual Output	155.0	37.7	98.1	24.0	4.3	0.8	45.4	11.4
% of Projected Output	47%	45%	34%	32%	43%	51%	165%	157%

Table 7, continued

Activity	Timber Stand Improvement	Reforestation	Clear-cutting	Shelterwood	Uneven-aged Selection	Commercial Thinning	Catastrophic 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
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

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
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
2005	452	212	0	0	0	0	1,028	4	1,032
Total Projected Output	8,000	6,650	21,795	12,730	2,040	none	none	none	36,565
Total Actual Output	9,237	4,583	3,757	6,265	151	54	3,826	122	14,175
% of Projected Output	115%	69%	17%	49%	7%	n/a	n/a	n/a	39%

Table 8. Monitoring items for stewardship contracting and wood product outputs using Revised Plan monitoring measures.

	Monitoring Driver	Monitoring Question	Description
27	Objective 2c Stewardship Strategy 1	Is the Bighorn National; Forest utilizing stewardship contracting appropriately? Is stewardship contracting a benefit to local communities?	The Forest offered one Integrated Resource Timber Contract (IRTC) or Stewardship contract for treatments in Shell Canyon. Offering this as a conventional timber sale may have shorted the preparation time and allowed operations to start earlier, but the reciepts from the sale would not have been available to reconstruct the Bench Trail. At the time, IRTCs were the only tool available to do all the work items including harvest, thinning, fence construction and trail reconstruction. New authorities for use of KV funds may have allow the Forest Service to accomplish work other than harvest through contracts or government personel. This would relieve timber purchasers from bidding these projects themselves and concentrate on timber harvest. Benefits to communities cannot be estimated at this time, however utilization of local work force was a evaluation factor in the award of the contract.

	Monitoring Driver	Monitoring Question	Description
29	Objective 2c Timber Strategies 1, 2, 3	Is the Bighorn National Forest providing the desired level of uses, values, products and services of wood products?	Projections for 2005 are based on the 1985 Forest Plan (see Table 7 above). The 2006 Monitoring and Evaluation report will utilize the projections in the Revised Forest Plan.

Rangeland Vegetation and Livestock Grazing

Table 9. Monitoring results for rangeland vegetation and livestock grazing using the Revised Plan monitoring measures.

Monitoring Item		Forest total
1	AUMs Permitted	112,680[7]
	AUMs Authorized	81,363
2	Acres of suitable rangeland in active and vacant allotments	Database records are not yet maintained for this item.
3	Acres of suitable rangeland in active allotments monitored for compliance with Annual Operating Instructions this FY	Database records are not yet maintained for this item.
4	Acres in active allotments meeting standards & guidelines (estimated)	Database records are not yet maintained for this item.
5a	Number of sites monitored Stubble Height/met standards/percent	This is not being compiled for FY 2005. This item is being reevaluated by the Forest Rangeland Management Team regarding its applicability at the Forestwide scale. It is appropriate at the individual allotment scale; however, it may be too detailed for the forest plan monitoring scale.
	Number of sites monitored Ocular/met standards/percent.	
	Number of sites monitored Robel Pole/met standards/percent	
	Number of sites monitored Clipped Plot/met standards/percent	
	Number of sites monitored Height-weight/met standards/percent	
	Number of sites monitored other protocol 1/met standards/percent	

[7] The only change from the 2004 permitted AUMs on the Forest, which was used as the basis for Forest Plan Livestock Grazing Strategy 1, is that 1,160 AUMs were incorrectly double-counted in 2004. Therefore, the drop in AUMs since 2004 and Forest Plan strategy is in number only and is not actual.

Table 9, cont.

Monitoring Item		Forest total
5a	Number of sites monitored other protocol 2/met standards/percent	
	Number of sites monitored other protocol 3/met standards/percent	
5b	Number of allotments that exceeded forage utilization standards to the point of discussing/ implementing actions to resolve the situation	PRRD – 3 MWPR – 2 Tongue -1 Total - 6

Table 9, cont.

Monitoring Item		PRRD		MWPR		Tongue		Forest Total	
		Est.	Verified	Est.	Verified	Est.	Verified	Est.	Verified
6	Acres meeting desired condition	14,715	0	6,000	0	15,403	9,251	36,118	9,251
	Acres moving toward desired condition	5,439	0	51,385	0	10,095	6,422	66,919	6,422
	Acres not meeting or moving toward desired condition	0	0	17,840	150	8,494	6,791	26,334	6,941
	Acres undetermined	0	64,571	0	78,219	201	15,806	201	158,776
7	Acres riparian meeting desired condition	2,842	0	250	0	1,775	0	4,867	0
	Acres riparian moving toward desired condition	385	0	2,543	0	4,417	0	7,345	0
	Acres riparian not meeting or moving toward desired condition	0	0	2,432	100	7,982	0	10,414	100
	Acres riparian undetermined	0	11,927	0	17,031	0	3,882	0	32,840

Table 9, cont. Monitoring results for rangeland vegetation and livestock grazing using the Revised Plan monitoring measures.

Monitoring Item		Description
8	Narrative describing information sharing and cooperation	The Bighorn National Forest rangeland management staff worked with Dan Uresk (Forest Service Research) and University of Wyoming extension in implementation of the Robel Pole monitoring method on sedimentary soil types on the north end of the Forest and trained permittees. They also read transects in cooperation with permittees and Guardians of the Range. The rangeland management staff assisted Uresk in locating areas to clip and run plots on granitic soil types on the south end of the Forest so a guideline can be established for the granitic soils. Colorado State University educator Roy Roath (funded through Wyoming Game and Fish Department) continued to work with PRRD rangeland management specialists and Battle Park Allotment permittees to discuss and develop management options in development of revised AMP. Forest rangeland management specialists attended the meeting of the Wyoming Section, Society for Range Management (SRM) in Casper; 6 specialists attended the 2005 SRM Annual Meeting in Texas.

Table 9, cont.

Monitoring Item		PRRD	MWPR	Tongue	Forest Total
9a	Number of allotments administered	17	24	22	63
9b	Number of allotments NEPA sufficient	10	18	19	47
9c	Number of allotments covered by NEPA decision made this FY	0	3	19	22
10a	Livestock-wildlife sites monitored	Not monitored in 2005.			
10b	Narrative describing wildlife-livestock herbivory conflicts	MWPR: There are really no changes in what was reported from 2004 to 2005. Combined utilization of wildlife and livestock use in some riparian and upland areas continues to exceed the 40-50% allowable use. We continue to work with permittees to try and keep livestock from concentrating there. These tend to be smaller areas (less than 40 acres) in comparison to the entire pasture. We did treat a few small aspen stands on the north end of the District by removing conifer encroachment manually and leaving the large material in place to break up cattle movement and protects some sprouts. PRRD: Two sites have been monitored jointly with Wyoming Game and Fish Department for browse on willow by moose. These sites were not read pre-grazing by cattle in 2005 but were marked in late season 2005 for reading in the spring of 2006 prior to livestock turn-on. Willow browse levels by moose in Sourdough and Muddy Creek allotments continue to appear heavy. No other site-specific areas or requests for monitoring have been identified.			

Invasive Species

Table 10. Monitoring results for invasive species using the Revised Plan monitoring measures.

Monitoring Item		PRRD	MWPR	Tongue	Forest Total
11	Acres of noxious weeds known to occur	Database records are not yet maintained for this item.			
12	Acres of priority noxious weeds known to occur	165	10	11	186
13a	Acres of manual treatment of noxious weeds	48	1	1	50
13b	Acres of mechanical treatment of noxious weeds	0	0	0	0
13c	Acres of cultural treatment of noxious weeds	0	0	0	0
13d	Acres of biological treatment of noxious weeds	0	0	0	0
13e	Acres of chemical treatment of noxious weeds	454	80	8	542
14	Narrative describing noxious weed prevention activities	Forestwide: Continued cooperative agreements with Big Horn, Johnson, and Washakie Counties for treatment of noxious weeds on National Forest. GPS points are provided for some treatment and inventory data. Treatment and inventory on lands adjacent to Forest was accomplished through cooperative efforts. An increased level of weed awareness on the Forest through educational programs presented to seasonal crews has led to identification of new populations of noxious weeds on the Forest and follow-up treatment has occurred or is planned. Noxious weed prevention and control is considered in NEPA projects on the Forest, including timber harvest, grazing activities, and dispersed and developed recreation. A growing concern is the dispersal of noxious weeds through ATVs and 4x4 pickups coming from other areas. Surveys have begun to pick up Russian knapweed in some roads right in the middle, and it is suspected that the weed seed is dropping off undercarriages. Weed seed free feed program continues to be monitored and compliance by forest users in general is very good. Bighorn County surveyed and inventoried approximately 6,400 acres in 2004 which resulted in treatment of 80.22 acres with herbicides. Additional infestations were physically pulled to stop seed production. Bighorn County Weed and Pest contributed over 20 hours of physical treatment alone with almost 175 hours of inventory and monitoring at no cost to the Forest. The cost per acre is up from 2004 due to the fact almost 100 fewer acres were treated; however this was because of a shift in focus of treating areas which involved houndstongue in more remote locations. Much more backpack spraying was involved which increases costs and decreases acres treated per hour.			

Noxious Weed Occurrences and Treatments in FY 2005

Table 11. Acres of noxious weeds and acres treated on the Bighorn National Forest in 2005.

	Powder River	Tongue	Medicine Wheel-Paintrock	Forest Total
Weed acres	502	188	9	*699*
Acres treated	502	81	9	*592*

Nineteen noxious weed species were treated across the Forest. Four species were treated on all three Districts: oxeye daisy, houndstongue, Canada thistle, and common burdock. For a complete list of species and acres treated, see Table A-2 in Appendix A.

Rare Plants

The following rare plant monitoring discussion is related to Revised Plan Monitoring Driver 9, monitoring items 3, 4, 6, and 7.

A one-person crew plus assistance from the Aquatic Biological Technician (Plants), inventoried approximately 131,380 acres of project areas, including Hunt Mountain AMP (Allotment Management Plan), Piney-Rock AMP, Shutts Flats Trail, and Gin Creek Reroute. 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.

Susan Bell, Biological Technician, discovered for the first time on the Forest, *Penstemon laricifolius* ssp. *exilifolius*, an R2 sensitive species. In addition, she documented the same species on public land along the road accessing National Forest System land.

Another first was discovering *Botrychium multifidum* on the Forest. It was found while conducting a prescribed burn last fall. Further follow-up needs to be conducted as the site was covered by snow a few days later before an intensive survey could be conducted.

A new population of *Penstemon caryi* was documented on the north end of the Forest. In addition, a *P. caryi* site first documented in 1979 was revisited and the extent and number of plants was further refined compared to the previous generalized location.

Another revisit was documented for *Eriophorum chamissonis* at Preacher Rock Bog.

Earl Jensen, a contractor, looked for *Pyrrocoma clementis* var. *villosa* and *Penstemon laricifolius* ssp. *exilifolius* this year. Mr. Jensen relocated a previously known site for *Pyrrocoma clementis* var. *villosa* but documented the extent of the population to be far greater than previously thought. Mr. Jensen also discovered a new *Pyrrocoma clementis* var. *villosa* site on the west side of the Forest. He also documented a new site for *Penstemon laricifolius* ssp. *exilifolius* on the west side of the Forest.

2005 was the fifth year of *Rubus arcticus* ssp. *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 National Forest. For plots 2, 3, and 4, there has been no "significant" change. However, plots 1 and 1.5 had a "significant" change from last year, and plot 5 had a significant change between 2000 and this year.

This was the third 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. Three of the four plots in the treatment units have been thinned through, and the piles have been burned around two plots. We are waiting for conditions to be within prescription in order to broadcast burn over two of the plots. At this time, it is still too early to draw any conclusions. New in 2005, 20 individual plants were permanently marked to track them over time to determine if individual plants increase in size each year, stay the same, vary from year to year, or possibly go dormant for some time before reemerging later.

In addition to the FY05 Region 2 Sensitive Plant Species, surveys were conducted for Bighorn National Forest Species of Local Concern and Demand Species. A new population of *Equisetum sylvaticum* was found, and a revisit to the Preacher Rock Bog *E. sylvaticum* site was documented.

In order to further our knowledge of rare plants, the Forest participated in three studies. Samples of *Letharia vulpina*, a lichenized fungi, were collected across the Forest and sent to Susanne Alterman, graduate student, at the University of California – Santa Cruz. Ms. Alterman's dissertation research project will, among other things, establish a more complete geographic distribution of the species and determine algal species partners. Tissue samples of *Penstemon caryi* and *P. laricifolius* ssp. *exilifolius* were also collected. These samples were sent to Alex Buerkle at the University of Wyoming. The aim of this study is to understand both the evolutionary relationship of species and the genetic consequences of rarity. Finally, the Forest provided locations of *Bromus tectorum* (cheatgrass) for research conducted by Cynthia Brown, Colorado State University, to explore the genetic variation allowing this species to expand it elevational range. It is anticipated that, in a few years, reports will be published documenting the findings.

Table 12. FY 2005 sensitive species and species of local concern on the Bighorn National Forest.

	New Occurrences in FY 2005	Expanded Occurrences in 2005	Previously Known Occurrences
Sensitive Species			
Botrychium multifidum Leathery grapefern	1		0
Cypripedium montanum Mountain lady's slipper	0	0	3 extant 1 historical
Cypripedium parviflorum Yellow lady's slipper	0	0	3
Eriophorum chamissonis Russet cotton-grass	0	0	3
Festuca hallii Hall's fescue	0	0	1 historical
Parnassia kotzebuei Grass-of-parnassus	0	0	2 extant

	New Occurrences in FY 2005	Expanded Occurrences in 2005	Previously Known Occurrences
			1 historical
Penstemon caryi Cary's beardtongue	1	1	14
Penstemon laricifolius ssp. *Exilifolius* Larchleaf beardtongue	2	0	0
Physaria didymocarpa var. *lanata* Wooly twinpod	0	0	4
Pyrrocoma clementis var. *villosa* Tranquil goldenweed	1	1	1 extant 2 historical
Rubus arcticus ssp. *Acaulis* Northern blackberry	0	0	1 extant 1 historical
Utricularia minor Lesser bladderwort	0	0	1
Species of Local Concern			
Equisetum sylvaticum Woodland horsetail	1	0	1

Table 13. Dates of last observations of all documented Bighorn National Forest sensitive species and species of local concern.

Decade of Last Observation	Sensitive Species	Species of Local Concern
Prior to 1900	5.0%	1.2%
1900s	10.0%	1.2%
1910s		
1920s		
1930s	2.5%	
1940s		
1950s		4.8%
1960s	2.5%	
1970s	10.0%	9.6%
1980s	2.5%	9.6%
1990s	15.0%	61.5%
2000s	52.5%	12.1%
Totals	100%	100%

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. Riparian, aspen, and shrublands habitats are emphasized through treatments such as exclosure 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 (WGFD) 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. It includes monitoring parameters found in the 2005 Revised Forest Plan (Chapter 4). A summary table provides monitoring responses to items prescribed in Chapter 4 of the Revised Plan, while this narrative provides some of the detail.

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, as both are threatened species. No other candidate or proposed species are currently listed for the Forest. In addition, the Rocky Mountain Region of the USFS updated its sensitive species list in 2003. The following accounts provide information for most of these sensitive wildlife species.

Lynx/Carnivores: During FY 2005, the Forest received a report of a lynx observation related to the lynx released in Colorado. This lynx traveled through Wyoming, including the Bighorn National Forest, on its way to Montana or further north. 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 received unconfirmed observation reports of lynx in FY 2003 but was not able to follow-up on track measurements due to delay in reporting and snowfall.

Snow track surveys for carnivores were conducted in association with boreal owl surveys in 2005; no rare carnivore tracks or sightings occurred. These surveys occurred over two days and were conducted primarily on the Medicine Wheel-Paintrock District.

No cameras were installed in FY05, by the Forest or its partners, to monitor for carnivores as in previous years. Few wolf sightings occurred on the Forest in FY 2005, as received in anecdotal information. No known predation events on livestock occurred on the Forest. No additional marten sightings occurred during FY 2005.

Bald eagles: No bald eagles were known to have nested on the Forest in 2005 (from employee and WGFD observations) nor have they historically nested on the Forest. 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 FY 2004 during aerial surveys being conducted for beaver.

Bats: The six bat houses on the Forest were not monitored in 2005. The monitoring protocol for bats specifies that the houses should be checked at least twice each month; once during daylight hours and once after dark. **Caves** provide habitat for sensitive bat species on Bighorn NF**.** In 2005, cave monitoring took place on July 13; several caves were examined in the Southwest Fuels project area above the Tyrell work center in Tensleep Canyon. These included Ridiculous Ice Cave, Crackos Pit cave, Groady Hollow, Room 222, and South of Room 222. These caves did not have good bat potential habitat and no good signs of bat use. Blue Moose Cave, in lower in Tensleep Canyon, was searched for and not found. Based on habitat in the area, this cave would receive minimal if any recreation use.

Boreal owls: In the East Zone, one calling survey was conducted, in the Burgess Junction area, as part of the West Zone surveys. In conjunction with the carnivore track survey, calling stations were conducted down the Bull Elk Park road/trail, and along the Dayton Gulch road back toward Burgess. No boreal owls responded. The remaining nest boxes were installed on the west side, and initial monitoring of the east zone nest boxes occurred with no boreal owls found, but one pair of saw-whet owls was using a box. A complete survey of all 100 boxes will occur in the spring of 2006, prior to third week of June. Finally, two boreal owls were observed by Matt Moran on September 5 at the Cabin Creek campground in Shell Canyon. This area will be checked for nesting owls through broadcast calling in the late winter of 2006, as previous surveys in the area did not detect any birds. This was the second report of boreal owls on the Bighorn National Forest; nesting has yet to be documented.

Goshawks: Monitoring occurred on some previously known territories. Active nests were documented, and project-related surveys were conducted in SW Fuels, West Ten2, Hunt Mountain., Pussyfoot, Shell Bench, Bald Mt, and Cold Springs timber sale areas. No new goshawk nests were detected in 2005. Dawn vocalization transects and historic nest surveys were conducted. During historic nest surveys, only the Cold Springs nest and Bucking Mule trail nest were found to be occupied. Cold Springs nest was surveyed five times in FY05. It was occupied on June 16. It was still occupied July 11, however all eggs were broken, probably due to a hail storm the week before. The nest was abandoned July 18 and during the following 2 surveys. A feather sample from this nest was sent to a Colorado State University student conducting research on genetic variation among goshawks in the west. Although no new goshawk nests were found, 2 goshawks were observed: one near permittee Schulte's cabin near Shell Creek Campground and the other near Hidden Teepee Creek off Highway 14A. In the East zone, known nest territories were checked, and no active goshawk nests were located. The switchback area nest along Hwy. 14 (above Dayton) was not active in 2005, though no project activity occurred either.

A total of approximately 13 goshawk nesting territories are known on the Bighorn National Forest or adjacent to it. Nests have been located largely through surveys associated with project planning; broad-scale systematic surveys have not been conducted on the Forest. Therefore, the abundance of hawks on the forest is unknown, but the extent of potential nest habitat suggests a larger population.

Peregrine falcons: No peregrine nesting activity was observed on the Tongue District during the 2005 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 2005, WGFD was not able to survey Shell Canyon or Tensleep Canyon. However, the District Biologist did a survey from the ground to monitor previously known active nests. These were determined to be inactive. Ground surveys near historic peregrine nests and other good eyrie locations in Shell and Tensleep Canyon were surveyed. Although nests have historically existed in these areas, none were observed this year.

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 four known breeding sites for spotted frog were monitored, and breeding success was confirmed for 2005. The number of egg masses observed was average, and reproductive success for this season was determined to be normal.

Annual monitoring of known breeding sites of wood frogs was conducted on the West Zone. Visual detection surveys were conducted by walking around known wood frog breeding habitat at Buckley Creek exclosure, Buckley potholes, an unnamed pothole near Adelaide Creek, Adelaide Lake, Mud Lake, and the area surrounding Lake Arden. Wood frog adults and tadpoles were found at Buckley creek exclosure and the unnamed pothole. One wood frog was found at Lake Arden. Two wood frogs and tadpoles were found at Adelaide Lake. No amphibians were found at Buckley potholes.

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 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 FY05, and a report of summer use also occurred in the Horse Creek mesa area on the west side. Upcoming projects involving their habitat are the Battle Park AMP and the Southwest Fuels project. A helicopter survey flight was used to help determine if leks are known on, or being used near, the Forest (within 2 miles). The survey flight took place on April 25, 2005 at 500 ft above ground level and was conducted from 5 miles south of the Southwest portion of the Bighorn NF to Shell Canyon. Possible sage grouse habitat and known leks both on and off the Forest were surveyed. Additionally, ground surveys on the northwest portion of the Forest were conducted. No sage grouse were observed on the Forest during the helicopter survey or ground survey. From these survey efforts, it is doubtful that the Forest is used for any leks or wintering habitat. Ground surveys did find leks in Cottonwood Canyon and Dugan Bench on BLM land outside the Forest boundary by two miles. Helicopter surveys similarly found leks on BLM land 4 miles west of the Forest.

Water voles: During FY 2005, no water vole surveys occurred, known populations were not monitored, and there were no reports of occupied habitat.

Black swift: No surveys for black swift were conducted at Bucking Mule Falls, Shell Falls, or Brindle Falls during FY 2005, due to lack of time and personnel. This species is not known to

occur on the Forest, though potential habitat may occur. In 2002, surveys of these sites did not detect any swifts but identified these three sites as having potential habitat.

Other TES: Sightings of TES and other significant wildlife species observed on the Forest were reported to the Wyoming Observation System, maintained by Wyoming Game and Fish Department, and to the Wyoming Natural Diversity Database, maintained by the University of Wyoming. These sightings are considered sensitive information and are not available to the general public. In addition, sightings of other sensitive bird species occurred through the Rocky Mountain Bird Observatory monitoring being conducted on the Forest, primarily for MIS purposes. These included the olive-sided flycatcher (less than 5 sightings per year), and the Brewer's sparrow (see below for MIS).

Bighorn sheep: Bighorn sheep surveys were conducted with WGFD in late July on Dugan Bench (Devils Canyon herd). Sixty-seven sheep were observed, of which 19 were collared. One sheep was observed within 200 feet of the Forest boundary near Hannans Coulee. There may be minimal use on the northwest end of the Forest by these sheep. The Forest may partner with WGFD in 2006 to facilitate monitoring this herd and the Shell Canyon herd (approximately 6 currently known).

Management Indicator Species (MIS)

Under the Revised Plan (2005), the Forest currently uses 6 MIS species for forestwide monitoring purposes and for project level analyses. MIS are required from the 1982 Forest Planning regulations (36 CFR 219.19), and are used to represent species tied to habitats often affected by management activities. According to the 1982 regulations, forestwide populations are to be monitored and results evaluated in relation to habitat conditions and trends. Monitoring and evaluation of MIS is one part of the larger program to provide for overall species diversity as the forest implements the forest plan. The Forest's MIS include **elk, red-breasted nuthatch, red squirrel, beaver, rainbow trout,** and the **Brewer's sparrow.** Species assessments were prepared for each of these species, as well as a document that describes the rationale for their selection as MIS. These documents from the Revised Plan planning record are incorporated by reference into this monitoring report. Species assessments contain further information on habitat condition and trend and known population factors, as well as monitoring approaches.

Elk were selected as an MIS based on their association with conifer habitat and road densities. Both factors can be affected by wildfire, prescribed fire, timber harvest, and travel management. Higher road densities (indicating more use by people) can displace elk out of an area. Revised Forest Plan direction including Objective 1b, Strategy 6 and Wildlife Guideline 6 provide guidance for this resource. Appendix A to the Revised Forest Plan also provides further direction.

Elk are common and are known to inhabit Bighorn National Forest primarily during spring through fall and may be seen at higher elevations onto 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 the Forest). 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 2004 Herd Unit reports (WGFD) were used to acquire the following information, which has changed little to the present date.

Table 14. Elk populations and objectives by herd unit on the Bighorn National Forest.

Herd Unit	Population Objective	Current Population (2004)
North Bighorn	4,100	5,500
Medicine Lodge	3,000	2,954
South Bighorn	2,900	4,932

It should be noted that the herd units include habitat off of the Forest, and animals spend a considerable amount of time off of the 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. The Revised Forest Plan establishes a habitat goal of maintaining or increasing the amount of elk security habitat. Security habitat is defined as hiding cover that is located at least 250 acres in size, non-linear (> 1,200' wide), and is at least ½ mile from an open road or motorized trail. Potential security habitat is that which is not currently elk security habitat, but that could become security habitat based on closing Level 2 roads or motorized trails (not Level 3 or higher). The following table displays the levels assessed from modeling conducted for the Revised Forest Plan. There were no significant changes in terms of timber harvests completed or wildfire occurrence (> 100 acres) to any of the geographic areas represented below. The west side of the Forest has naturally lower levels of security habitat due to more open meadows and naturally fragmented stands of timber. Refer to the Revised Forest Plan Appendix A for further information on elk security habitat. No changes have occurred beyond the anticipated effects as analyzed in the FEIS for old growth, coarse woody debris, or snags. This monitoring document is tiered to and incorporates by reference the FEIS analysis for these topics.

Table 15. Potential and existing elk security in geographic areas (2002).

Geographic Area	Total Acres in Planning Unit	Percent Forested	Existing Security Habitat Acres and Percent of Total Area	Potential Security Habitat Acres and Percent of Total Area	Existing Security as a Percent of Potential Security Habitat
Clear/Crazy	155,936	72%	9,506 (6%)	29,735 (19%)	32%
Devil's Canyon	61,198	58%	5,685 (9%)	12,748 (21%)	45%
Goose Creek	116,952	80%	18,786 (16%)	43,053 (37%)	44%
Little Bighorn	141,815	69%	22,551 (16%)	33,855 (24%)	67%

Geographic Area	Total Acres in Planning Unit	Percent Forested	Existing Security Habitat Acres and Percent of Total Area	Potential Security Habitat Acres and Percent of Total Area	Existing Security as a Percent of Potential Security Habitat
Paintrock Creek	107,943	51%	5,992 (6%)	10,227 (9%)	59%
Piney/Rock	110,255	79%	30,988 (28%)	64,197 (58%)	48%
Shell Creek	140,130	48%	4,690 (3%)	14,780 (11%)	32%
Tensleep Creek	101,130	57%	647 (1%)	7,678 (8%)	8%
Tongue River	177,069	69%	26,976 (15%)	51,411 (29%)	52%
Totals	1,112,428	~60%	125,821 (11%)	267,684 (24%)	47%

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 increase 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 from as early as July through the winter. Recent projects such as the Clear/Crazy Designated Motorized Travel System and the Woodrock project have sought to reduce open motorized route density for watershed and elk habitat reasons.

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. It is not generally thought that there is a lack of forested cover on the Forest, as timber harvest has only occurred on approximately 20% of the forested acres, with approximately 4% of the forested acres having been clearcut (Regan et al. 2003). Besides fire, clearcutting is the most significant impact to hiding cover.

The red-squirrel and red-breasted nuthatch were selected as MIS based on their association with mature conifer habitat, which can be affected by wildfire and timber harvest activities. Habitat components of snags and coarse woody debris are of importance to these species and several others on the Forest. Objective 1b and Strategy 8 (old growth) under it in the Revised Forest Plan provide the management emphasis for these species. In addition, Biodiversity Guidelines #4 and #10 provide direction for these species.

The Forest has applied the HABCAP model during project level analyses to assess habitat for these species. 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 indices were last updated in 1993 and are still valid. The following table shows the level of habitat currently occurring for these species at the forestwide

scale. Numbers for the habitat were derived from the Common Vegetation Unit (CVU) GIS database, based on 2002 values. Since that time, two significant wildfires (Little Bighorn and Riley Point). The fires were not incorporated into the database; however, the approximately 8,000 acres involved would not significantly lower the HABCAP value at the forestwide scale. In FY05, there were no significant timber sale harvests or wildfires that would have changed these values.

Table 16. HABCAP values for red squirrel and red-breasted nuthatch at the forestwide scale.

Species	HABCAP Habitat Value
Red-breasted nuthatch	47%
Red squirrel	71%

There is currently no way to assess the forestwide availability of snags and coarse woody debris. However, as described previously for elk, there is a limited amount of timber harvest on the Forest that could reduce these habitat components. As a surrogate, and as displayed in the FEIS for the Revised Forest Plan, the Forest currently estimates that it has adequate reserves of old growth to meet the levels required for management direction.

The Forest also conducted an **old growth inventory** for the Goose Creek watershed in FY2005. This was done in anticipation of timber harvest planned in the area and to meet Revised Forest Plan strategies. This effort followed the Mehl (1992) definitions of old growth, and was performed by a contractor (Shell Valley Consulting). The effort resulted in determining if adequate levels to meet the 10% and higher levels suggested in the Revised Forest Plan were met within conifer cover types in this watershed. In addition to old growth, the FEIS for the Revised Forest Plan also discusses current condition and anticipated impacts to coarse woody debris and snags, specifically. No changes have occurred beyond the anticipated effects as analyzed in the FEIS for old growth, coarse woody debris, or snags. This monitoring document is tiered to and incorporates by reference the FEIS analysis for these topics.

To assess populations for these two species and for the **Brewer's sparrow** (see below), the Forest began implementing an avian monitoring program in 2002. The monitoring is based on point counts. It is being conducted by the Rocky Mountain Bird Observatory (RMBO) in Brighton, CO, through a cooperative, interagency program modeled after the similar successful program in Colorado. The Forest also provided financial support to the statewide monitoring program. 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 as determined by the MIS selection process for the Revised Plan. Red squirrels are treated as an avian species due to their audible detections of alarm calls.

Assessing trend will not be possible until the completion of the 2006 field season with this program, as approximately 5 years are necessary to determine trend. However, the following data was provided with the 2004 report from the RMBO (Faulkner, 2004). It represents the number of detections by habitat type on the Bighorn National Forest. The protocol is considered to be robust based in terms of sample design for the priority habitats.

The 2005 season final report was not available at the time this monitoring report was written.

Table 17. Results of avian/squirrel monitoring conducted by RMBO on Bighorn National Forest, 2002 - 2004.

Species	High Elevation Conifer			Mid Elevation Conifer			Montane Riparian			Shrub steppe (Sage/grass)		
	2002	2003	2004	2002	2003	2004	2002	2003	2004	2002	2003	2004
Red-breasted nuthatch	32	34	12	36	35	13	17	5	4	7	16	10
Red squirrel	87	117	181	64	102	119	20	49	70	0	0	39

Annual fluctuations in bird populations are not currently thought to be attributed to habitat changes, as few activities have occurred over the Forest in these three years that would explain the magnitude of difference in these numbers. Rather, as is inherent to any wildlife population, abundance of prey/forage for these species may vary proportionally to moisture received in terms of climate and other weather related events that have a dynamic effect on populations. Neither of the bird species listed above are hunted, nor are they taken through any significant amount through illegal shooting. While the red squirrel is hunted, the amount taken is negligible or undetectable compared to the forest-wide population for this species.

In addition to the above mentioned surveys being conducted by the RMBO, Breeding Bird Surveys are conducted for two routes on the Forest, known as the Bald Mountain and Crazy Woman routes. When examined from the years 1966 - 2004, these can provide some indications of trend, though sample size and other biases are strong (Sauer et al. 2005; http://www.pwrc.usgs.gov). Red squirrels are not tracked through this monitoring protocol.

Table 18. Breeding bird survey population trends for red-breasted nuthatch on Bighorn National Forest.

Species	Bald Mt. Route	Crazy Woman Route	Statewide
Red-breasted nuthatch	-17% (Avg. of 1.5 birds counted per year)	+12% (Avg. of 1.5 birds counted per year)	+3.5%

Obviously, where only one or two birds are counted in a route on average, an annual change of even one additional or less bird observed would create a large change in the trend for the route.

In summary, there have been no changes in habitat configurations in this reporting period or cumulatively that would indicate a change in habitat beyond levels that may naturally occur and fluctuate have occurred as a result of forest plan implementation.

The Brewer's sparrow, a sagebrush obligate species, was selected as an MIS based on its known declines rangewide, and due to its response to potential habitat changes from management activities (prescribed burning, noxious weeds, wildfire, mechanical treatments, livestock grazing) that may occur in sagebrush. Management direction for this species is evident in Objective 1b and Strategy 2 within the Revised Forest Plan. Biodiversity Guideline #5 and Wildlife Guidelines #10 and #11 also provide direction for this species.

The Forest's Common Vegetation Unit GIS database includes sagebrush acres and canopy cover which were estimated from 1:24,000 scale, color infrared, aerial photographs. For individual project analysis, sagebrush canopy cover is divided into high, medium, and low cover classes to

estimate diversity of habitat conditions and amount of nesting habitat for Brewer's sparrows and other species, such as sage grouse. The HABCAP modeling process is not used to assess effects due to the lack of indices for this species within the model. Approximately 262,000 acres of sagebrush habitat occur on the Forest, predominately on the west side of the Bighorns. In general, through more broad-based assessments conducted (e.g. Tensleep CEEM Assessment 2002, Tongue AMP FEIS 2005), sagebrush is regarded to be predominantly comprised of mature stand conditions due mostly to a lack of wildfire in these community types. The Forest conducts a significant portion of its prescribed burning on an annual basis in this habitat type, estimated at approximately 2,000 acres per year. Sagebrush may require 20 – 50 years to return to a mature canopy condition, depending on site growing conditions and the severity of the disturbance. Of greatest risk to the sagebrush habitat type and species dependent on it is the conversion to noxious weeds or undesirable vegetation such as cheatgrass. The Forest developed an initial action plan for noxious weeds in 2004, and has further refined it in 2005. In addition, projects seeking to disturb sagebrush have had surveys for weeds conducted prior to planned disturbances to minimize potential adverse effects (e.g. Southwest Fuels survey in 2005). The Revised Plan FEIS also described habitat-related effects to this species, to which this monitoring document is tiered and incorporates by reference. No changes have occurred to habitat beyond the anticipated effects as analyzed in the FEIS, and no significant wildfires (>100 acres) have occurred within this habitat type this year.

As mentioned above for the nuthatch, in order to assess trends for this species and other avian species, the Forest began an avian monitoring program as conducted by the Rocky Mountain Bird Observatory. The following figure depicts the results of that existing monitoring approach. The 2005 data was not included as it was not available at the time this document was prepared. Methodology for this species focuses on the 10 transects conducted within sagebrush habitat type on the Forest.

Table 19. Results of Brewer's sparrow monitoring conducted by RMBO on Bighorn National Forrest.

Species	High Elevation Conifer			Mid Elevation Conifer			Montane Riparian			Shrub steppe (Sage/grass)		
	2002	2003	2004	2002	2003	2004	2002	2003	2004	2002	2003	2004
Brewer's sparrow	2	0	11	5	3	5	3	3	6	78	100	81

As is evidenced in the table above, populations exhibit natural fluctuation in response to prey and climate related factors, as there have been no widespread changes in habitat on the Forest to account for these fluctuations. The Breeding Bird Survey, as referenced with the nuthatches, can also provide some population information, as included in the table below.

Table 20. Breeding bird survey population trends for Brewer's sparrow on Bighorn National Forest.

Species	Bald Mountain Route	Crazy Woman Route	Statewide
Brewer's sparrow	-82% (Avg. of 1.2 birds counted per year)	-31.5% (Avg. of 1.7 birds counted per year)	-1.1%

As mentioned with the nuthatch, when such a low count is obtained, any fluctuation in the number of birds observed on a transect can have a drastic effect on the trend reported.

There have been no changes in the habitat to indicate a change in the viability determination (see the FEIS Appendix K for the Revised Forest Plan) for this species. FEIS Appendix K is incorporated by reference.

Beaver were selected as an MIS as they provide habitat for many other species, and strongly influence watershed function and health combined with willow and aspen health. Beaver habitat is strongly tied to effects from livestock grazing and road building in riparian areas, two of the most prevalent potential management impacts on the Forest. Management direction for this species is evident in Objective 1b and Strategy 5, within the Revised Forest Plan. In addition, Soil/Water/Riparian Standards #1 and #2 and Guidelines 1 – 4, Wildlife guideline #12, Fisheries Guidelines #2 and #3, and Infrastructure –Travelways Guidelines #2 and #7.

An aerial survey on the Forest (combined fixed-wing and helicopter) conducted in October of 2003 (FY04), 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, only 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. Future inventories on the Forest (2008) will stratify the sampling by watershed in conjunction with a recent monitoring publication on beaver sampling (Beck and Staley 2005).

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. Then, in 2004, a total of approximately 50 beaver were released in drainages on the north end of the Forest in Prospect, Owen, and Marcum Creek drainages. In 2005, 15 beaver were placed in Little Sourdough Creek below Highway 16, and 10 were placed in Hesse Creek off of the Sheep Mt. Lookout road, both locations on the Powder River Ranger District. 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 (i.e. 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 at reduced numbers, there is not an indication that beaver are still being reduced 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 transplanted beaver on Owen Creek at the Hwy. 14 crossing continued plugging the culvert after spring thaw removed most of the deceiver constructed the previous year. This structure was rebuilt in August to prevent plugging of the culvert prior to winter freezing, and seemed successful. Newly transplanted beaver into Little Sourdough at the Highway 16 culvert required a similar deceiver to be constructed. This was eventually successful with the District Biologist's persistence. The Little Sourdough site did not have any suitable backwater to establish a decoy dam. No other problem sites have been detected to date.

Habitat conditions for this species will be assessed in conjunction with the riparian/water quality and livestock grazing monitoring currently being developed associated with the monitoring plan for 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 2005 as proactive habitat management projects. The Forest received a target of maintaining or restoring 1,000 acres of wildlife habitat for FY2005. This target was accomplished through aspen treatments, prescribed burning, and exclosure maintenance.

Aspen: For 2005, a much larger emphasis was placed on treating aspen by removing conifers as per recommendations from Dale Bartos (2003). Approximately 208 acres were treated at 27 sites on the Forest. Most of these acres treated were within Wildland-Urban Interface (WUI) areas and served to accomplish a significant portion of the Forest's Accelerated Watershed and Vegetation Restoration Plan targets. Work was accomplished with seasonal wildlife crew, fire crew, and district wildlife biologists. For a complete list of FY 2005 aspen treatments on the Forest, see Table A-3 in Appendix A.

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 aspen stand in the Lower Pasture in the Granite Allotment on the Medicine Wheel-Paintrock District. The two stands in the Shell Creek allotment were monitored in 2004. During the 2005 field season, exclosures around aspen stands on the Medicine Wheel-Paintrock Tongue, and Powder River Ranger Districts were monitored. For a complete list of aspen exclosures by District, see Tables A-4 through A-6 in Appendix A.

Table 21. Number and acres of aspen exclosures maintained on the Bighorn National Forest in 2005.

District	Total number of exclosures	Total acres
Medicine Wheel-Paintrock	10	17
Tongue	15	26
Powder River	4	6

In addition to the above, the Grommund Mystery aspen exclosure was scheduled for removal this year, but not accomplished. This fence was constructed to exclude cattle but not big game, and is not effective in protecting aspen sprouts from browsing. This will be scheduled for 2006, as there are no viable aspen sprouts remaining.

The plastic mesh fence at the Trigger Lake road site appears to have withstood the winter snowfall. A new fence at the Muddy Creek aspen restoration site was partially constructed in 2005 using Rocky Mountain Elk Foundation (RMEF) funding, awaiting removal of conifer via a timber sale contract before final fence construction is accomplished.

Willow/Riparian: During the 2005 field season on the Medicine Wheel-Paintrock District, inspection and maintenance was performed as necessary on 12 willow/riparian exclosures. The willow photo monitoring point on Granite Creek was read, however the Sheep Creek sites were not monitored. All of the riparian exclosures on the Tongue District were maintained this season. These exclosures protect 268 acres of riparian habitat and a total of 4.41 miles of fisheries streams. All of the riparian exclosures on the Powder River District were maintained this season. These exclosures protect 5.5 acres of riparian habitat. For a complete list of the willow/riparian exclosures by District, see Tables A-7 through A-9 in Appendix A.

Table 22. Number and acres willow/riparian exclosures on the Bighorn National Forest in 2005.

District	Total number of willow/riparian exclosures.	Total acres
Medicine Wheel-Paintrock	12	20
Tongue	10	268
Powder River	11	5.5

Some of the 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. It has been shown that even one years worth 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 2005.

Preliminary discussions with Wyoming Game and Fish Department (WGFD) 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 2005 in conjunction with WGFD (D. Thiele). Transects for willow and livestock/moose use in the North Tongue area were monitored by range and WGFD personnel in FY 2005.

Winter Range/Upland Exclosures: The Medicine Wheel-Paintrock District maintained 7 exclosures (7,007 acres) that provide important upland and big game winter range habitat. The largest of these is the 7,000-acre Shell Canyon big game winter range exclosure. See Table A-10 in Appendix A for more information.

Prescribed Burning and Monitoring and Wildfire: The Forest accomplished 9 prescribed burns (1,839 acres) that benefited wildlife. For a complete list of the individual burns, see Table A-11 in Appendix A.

More of the Dry Fork Unit was burned during October of 2004 (FY2005). A total of 670 acres of grass and sagebrush have been burned to date. This project is partially funded by the Rocky Mountain Elk Foundation. In addition to prescribed burns, the wildlife crew also assisted in

construction of hand line around the next units to be burned in the Dry Fork unit, part of the Little Bighorn project. Approximately 200 acres of grass/sage fuel type were prepared for prescribed burning in spring of 2006.

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 FY2006.

On the Tongue District, monitoring of past prescribed burns did not take place during FY 2005. The specific burns scheduled for monitoring 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 FY 2006. 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.

During 2005, there were no wildfires of significance (>100 acres) that would have helped improve wildlife habitat diversity on the Forest.

Other Habitat Projects: Areas treated for conifer encroachment into meadows in FY2005 on the Tongue District were primarily along Highway 14 at Prune Creek, and around the Pine Island group use area. In addition, several small meadow areas were treated for conifer encroachment in conjunction with aspen treatment work. Meadows adjacent to aspen stands were treated. A total of 40 acres were treated this year.

The swallow condos at Burgess Ranger Station were monitored during the 2005 field season. All condominiums are being used, and no further work is required.

Nest boxes for kestrels were not maintained or monitored on the Tongue District. A total of 6 boxes are currently installed. Annually, we attempt to clean the boxes out and replace a layer of fresh wood chips.

Partner Spending Report: For the first time, the Forest received a target on reporting the amount of money that was used in partnerships to accomplish wildlife related work in FY2005. The target was to track how we matched $120,000 of USFS money with others' money, and was derived from the annual accomplishments reported in the Wildlife, Fish, and Rare Plant database. In 2005, the Forest received money from 19 partners; contributions totaled $120,000. The cooperative projects ranged from prescribed burns for wildlife habitat improvement to cooperative education and fishing days for area youth. See Table A-12 in Appendix A for a complete list of partners, projects, and contributions.

Public Education Efforts – Wildlife: In FY 2005, the Forest received a target of two wildlife/fish/plant related environmental education presentations as targets. The Forest again participated in the Casper Hunting Expo that targets school children, coordinated by the WGFD. In addition, the Medicine Wheel-Paintrock District biologist hosted the Kids' Fishing Day at

Porcupine Guard Station, and the Supervisor's Office Aquatics shop hosted the Kids' Fishing Day at the Sheridan County Fairgrounds. A presentation on bear safety was given at the Lovell Middle School by the District Biologist. In addition, the Forest provided a college presentation for both aquatics and wildlife habitat to the Sheridan College wildlife class on two different occasions. No presentations occurred on rare plants.

SOCIAL COMPONENTS

Heritage Resources

Program Summary

The program priority remains project level support and an increased emphasis on Section 110 surveys. Monitoring efforts form 2005 are listed in the following table:

Table 23. Heritage resources monitoring on the Bighorn National Forest in FY05 using Revised Plan monitoring measures.

Monitoring Driver		Monitoring Question	Description
21.	Objective 2b Heritage Strategy 1	Have programmatic agreements for heritage resources been negotiated and implemented for Forest programs?	Programmatic agreements for travel management, fire, the Medicine Wheel, and the Woodrock Tie-Hack District are in place. Currently working on developing agreements for Recreation residences, Grazing, and Timber. Terms of agreements are being met.
22.	Objective 2b Heritage Strategy 2	Is the Bighorn National Forest preparing and implementing Historic Preservation Plans?	Two plans have been completed (Medicine Wheel and Woodrock), and two are currently being prepared.
23.	Objective 2b Heritage Strategy 3	What progress has the Forest made for inventorying areas having a high probability for heritage resources?	60 acres have been inventoried. 40 new sites have been evaluated. No backlogged sites have been evaluated. No sites evaluated in 2005 have been sent to the National Register of Historic Places.
24.	Objective 2b Heritage Strategy 4	Is the Forest meeting its consultation responsibilities for American Indian traditional cultural properties?	The Forest is meeting its consultation responsibilities. Four sites were identified and consultation took place on four sites.

Monitoring Driver		Monitoring Question	Description
25.	Objective 2b, Heritage Strategy 5 Objective 2c, Tourism and Recreation Strategy 2	What actions has the Forest taken to increase public awareness and education of heritage resources?	Two "Passport in Time" (PIT) projects have been completed. Approximately 200 heritage programs have been delivered, both on the Forest and in the surrounding communities. 43 interpretive signs or brochures were constructed or maintained.

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.

Table 24. Lands and special uses monitoring on the Bighorn National Forest in FY05.

Monitoring Driver		Monitoring Question	Description
38.	Objective 4b Strategy 1	To what extent are forest access needs being met?	Projects in FY 2005 included the acquisition of one right-of-way in July, as well as the completion of the Tie Hack Reservoir Land Exchange. The Forest has also been working to identify and resolve public access issues when possible.

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 Revised Forest Plan 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).

Table 25. Recreation monitoring on the Bighorn National Forest in FY05.

Monitoring Driver		Monitoring Question	Description
2.	Objective 2a, Strategy 8 Objective 4c, Strategy 4	How well is the Forest interacting and planning in cooperation with communities and local governments?	Tongue Ranger District: Nothing to report Medicine Wheel-Paintrock District: Ongoing coordination and/or agreements with: 1) Montana Conservation Corps, WY State Trails, International Mountain Biking Association, and local bike groups on Bench Trail improvements, 2) Shoshone Back Country Horsemen on Trail maintenance on the Bucking Mule National Recreation Trail and Battle Park area trails. In addition, the Medicine Wheel-Paintrock District is engaged with local governments on: 1) District and BLM on travel management planning in the Mexican Hill area. 2) Big Horn County and local chambers of commence on the Bench Trail reconstruction project.
17.	Objective 2a, Strategies 5, 6, 9, 10, and 12 Objective 4a, Strategy 1	Is an adequate range of travel opportunities being offered across the Forest?	Tongue Ranger District: 1 –Woodrock Project ROD signed 3/2005 Medicine Wheel-Paintrock Ranger District: Hunt Mountain Travel Management Planning started but not scheduled for completion until fall of 2006. Powder River Ranger District: Clear/Crazy

Monitoring Driver		Monitoring Question	Description
			Dispersed Motorized Transportation System decision memo signed by District Ranger Booth March 2005. Implementation began with signing existing trails, locating new ORV trail routes, preparing handouts for visitors to the Clear/Crazy decision area, and decommissioning roads (8 miles completed). Implementation will continue in 2006.
39.	Objective 2c, Tourism and Recreation Strategy 1 Objective 3b, Strategy 3	Are research, education, and interpretation activities being conducted and in conjunction with partners?	Tongue Ranger District: 5 Smokey (Fire Prevention) presentations to schools/day cares. 1 Leave No Trace/Wilderness presentation 45 Weed presentations (Sports Expos, etc.) 1 Forestry/Forest Management presentation 1 Forest Succession/Ecology presentation 2 Fire's role and fire management presentations

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 infrastructure maintenance has never been adequate, thus some maintenance is deferred. As budgets have declined, the amount of deferred work, or backlog, has increased dramatically. In addition, the majority of the 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. An ambitious five-year inventory and reporting program was initiated to identify annual maintenance, deferred maintenance, and capital improvement needs for the entire Forest Service infrastructure. Through this initiative, every road, trail, building, campground, bridge, etc. was reviewed for annual and deferred maintenance needs and capital improvement needs for the next five years. Since the completion of this review, the inventory on level 3, 4, and 5 roads was repeated, surveying every mile of road over a five-year period. Random samples of level 1 and 2 roads have been surveyed to compare to those previously done.

In 2005, the Bighorn National Forest did not perform condition surveys on any maintenance level 3, 4, and 5 roads (i.e., roads open for travel by passenger vehicles, with varying degree of user comfort). This does not mean the forest is behind in surveying but will need to accomplish more in the summer of 2006.

In 2005, three wage grade 10 engineering equipment operators were hired on 13/13 appointments. In 2005, routine maintenance was performed on approximately 252 miles of maintenance level 3, 4, and 5 roads by force account crews and by permit holders according to the permit requirements. Level 3, 4, and 5 roads are roads open to passenger vehicles. Work done on maintenance level 1 and 2 roads was done primarily on the Powder River District. Routine maintenance was also done on approximately 152 miles of level 2 roads. Maintenance objectives for maintenance level 2 roads are, typically, to 'maintain to standard every 3 years.' As such, roads receiving maintenance in the past two years didn't necessarily require maintenance in 2005 but were counted in the mileage total as receiving maintenance. In 2005, crews maintained approximately 70 miles of level 1, or closed, road. This equates to 470 miles out of 530 as meeting maintenance objective for the year. Road maintenance objective for level 1 roads are to maintain to standard every 4 years.

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 2005, as funding was short.

Two bridges were removed in 2005 and replaced with bottomless arch culverts. Both of these new culverts access summer homes near the Porcupine area. In 2005, as a result of the Clear/Crazy decision to limit travel to designated roads and trails, eight miles of road were decommissioned, including both system and non-system road. In addition, there was a contract awarded in 2005 for the stabilization of 2 miles of road to Tie Hack Reservoir, and for the removal of boulders and surface rock for 2 miles of road 293 to Park Reservoir. The work on both of these roads will be done in 2006.

In 2005, approximately 8 road bridges were inspected, as required by the Federal Highway Administration (FHWA) and by the Forest Service Manual direction. Numerous bridge decks were cleaned, and existing regulatory warning signs around bridges were upgraded.

Inspections were performed on approximately 12 different administrative buildings during the 2005 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 5 sanitary surveys were performed on existing administrative water systems, and 10 sanitary surveys were conducted on existing recreational water systems.

Wilderness

Table 26. Wilderness use monitoring for FY05 using Revised Plan monitoring measures.

Monitoring Driver		Monitoring Question	Description
18.	Objective 2b, Wilderness Strategies 2 – 5	Are human uses of wilderness allowing for preservation of wilderness resources? What level of crowding occurs on trails? Does the wilderness provide opportunities for solitude?	See following graphs.
19.	Objective 2b Wilderness Strategy 1	Is air and water quality being improved, maintained or degraded in the Cloud Peak Wilderness, and on the Forest as a whole?	The IMPROVE air monitoring station operated by Air Resource Services (ARS) under contract with Wyoming DEQ continues to monitor Air Quality standards and is authorized through 2007. Emerald Lake and Florence Lake were sampled the specified three times each this season. No evidence of impairment of air quality in relation to Forest activities has been found. Results from the Rocky Mountain Research Station are on file at the Supervisor's Office.

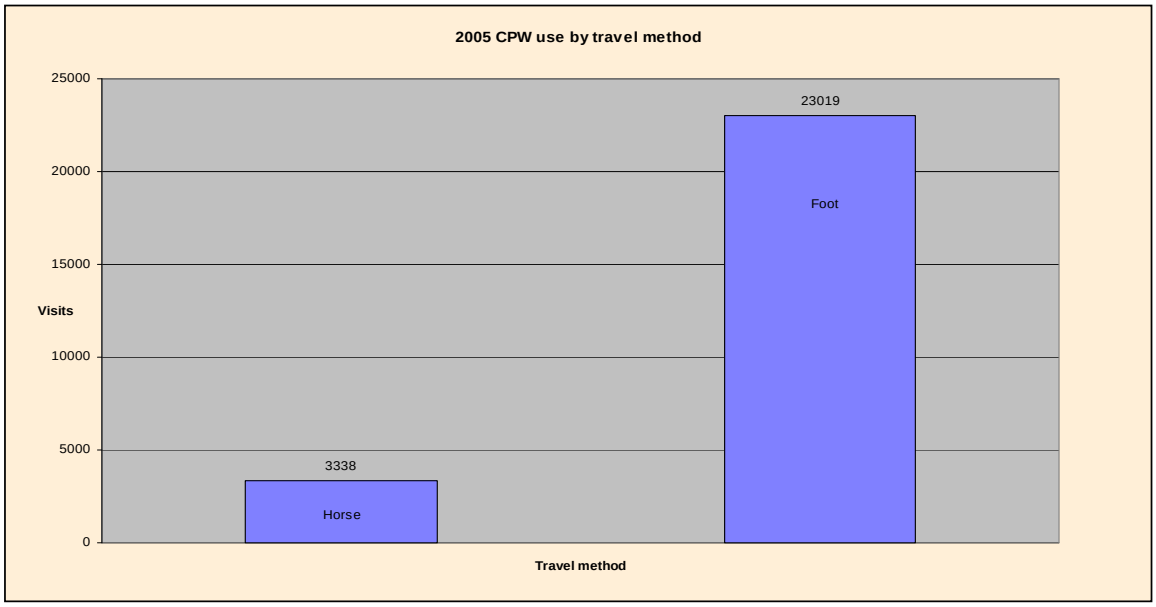

Figure 5. Cloud Peak wilderness use by travel method in FY 2005.

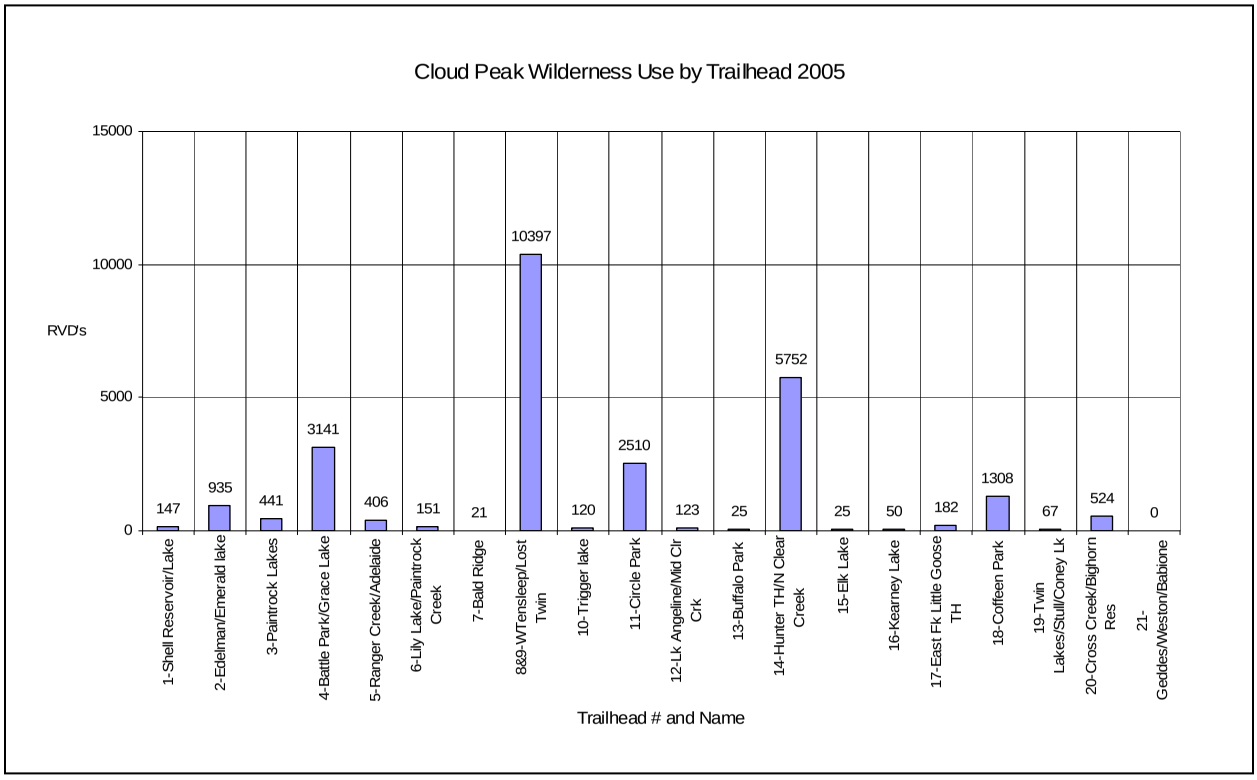

Figure 6. Cloud Peak Wilderness use by trailhead in FY 2005.

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[8]
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 cited were updated in the 2005 Forest Plan Revision.	Done
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 was accomplished in the 2005 Forest Plan Revision.	Done
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 was accomplished in the 2005 Forest Plan Revision.	Done

As monitoring and evaluation of the Revised Forest Plan occurs, it is anticipated that this section of the report will be used to identify Forest Plan amendment or revision needs and to track the disposition of those items.

[8] This item will continue to be tracked in the next annual monitoring report.

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David Beard – Tongue District Rangeland Management Specialist

- B.S. Agricultural Production, Range Science Option.
- Twenty-three years experience with the Forest Service including work on the Custer National Forest, Montana; Pike/San Isabel National Forest, Colorado; Nebraska National Forest, South Dakota; and the Bighorn National Forest, Wyoming.

Ruth Beckwith – Landscape Architect

- B.L.A. from Kansas State University (1979).
- Twenty-seven years of experience with the Forest Service on the Pike-San Isabel, Rio Grande, White River, and Bighorn National Forests; Licensed Landscape Architect.

Beth Bischoff – Rangeland Management Specialist

- Bachelor of Science in Range Management w/ wildlife emphasis from Oregon State University, 1990.
- Seventeen years experience in range management with Forest Service on the Bighorn National Forest.

Bernie Bornong – Forester

- B.S. in Forestry from Iowa State University (1981).
- Twenty-one years experience with Forest Service on the Idaho Panhandle, Gila, Black Hills, and Bighorn National Forests.

Craig Cope – Powder River District Recreation/Wilderness/Lands Staff

- B.S. Forestry from Pennsylvania State University.
- Twenty-six years of experience with the Forest Service on the Ashley, White River, Black Hills and Bighorn National Forests.

Phil Fessler – Civil Engineer

- B.S. Civil Engineering, South Dakota School of Mines and Technology.
- Twelve years experience with the Forest Service on the Shoshone and Bighorn National Forests.

Scott Gall – Powder River District Rangeland Management Specialist

- B.S. Natural Resources Management University of Nebraska
- Six years of experience with the USDA Soil Conservation Service. Sixteen years with the Forest Service on the Bighorn National Forest.

Harold Golden – Wildlife Biologist (East Zone)

- B.S. in Wildlife Biology from Colorado State University.
- Twenty-five years experience with the Forest Service.

Cindy Gradin – Law Enforcement Officer, Bighorn National Forest

- M.S. Wildand Recreation, B.S. in Natural Resource Management
- Seventeen years experience with the Forest Service on the Nez Perce, Routt, Medicine Bow, and Bighorn National Forests. Ten years with Law Enforcement, 6 years in Recreation Planning.

John Hagengruber – Recreation Planner

- B.S. Biological Aspects of Conservation from University of Wisconsin – Madison (1993). M.S. Resource Management from University of Wisconsin – Stevens Point
- Five years of experience with the Forest Service on the Bighorn and Lewis & Clark National Forests. Four year's experience with the Wisconsin Department of Natural Resources in watershed management and recreation. One year of experience with Dane County Planning Department (Madison, WI)

Leslie Horsch – Writer-editor

- B.S. in Watershed Sciences, Colorado State University, 1983; M.S. in Watershed Resources, University of Wyoming, 1995.
- Eight years writing-editing experience for various Forest Service units including the Bighorn, Medicine Bow-Routt, Pike-San Isabel, and Nebraska National Forests, the Little Missouri National Grasslands, and the Rocky Mountain Regional office. Nine years hydrology experience with various entities including the Medicine Bow-Routt National Forests.

Kevin Khung – Recreation Staff Officer

- B.S. in Natural Resources, Environmental Design, University of Massachusetts, 1987; Masters Landscape Architecture, Kansas State University, 1991
- Fourteen years experience with the Forest Service on the San Juan and Bighorn NF (R2) and Region 9 Technical Service Team

Gayle Laurent – Realty Specialist

- Twenty-six years experience with the Forest Service on the Los Padres and Bighorn National Forests.

Rick Laurent – Archaeologist

- B.A. Anthropology and M.A in American Studies from the University of Wyoming.
- Nineteen years experience with the Forest Service on the Medicine Bow, Routt, and Bighorn National Forests. Two years of archaeological experience with the University of Wyoming and four years with private contractors.

Loren P. Poppert – Medicine Wheel/Paintrock District Recreation Staff Officer

- B.S. Forest Management University of Missouri (1987)
- Seventeen years of experience with the Forest Service on the Humboldt, Black Hills, and Bighorn National Forests. Two years of experience with the North Central Forest Experiment Station in Missouri, Iowa, and Minnesota. One year experience with the University of Missouri Hydrology department.

Galen Roesler – Forest Fire Management Officer

- B.S. in Biology from Black Hills State University (1973)
- Thirty-one years experience with the Forest Service on the Olympic, Kootenai, Black Hills, and Bighorn National Forests.

Dan Scaife – Forest Hydrologist and Aquatic Hydrologist

- Bachelor of Science in Watershed Management, University of Arizona, 1994; Master of Natural Resources, Utah State University, 2003.
- Field experience in hydrology and fisheries from 1994 – 1998 on the Shoshone National Forest. Worked for Agricultural Research Service in Miami, Fl determining soil and water characteristics related to the Everglades Restoration effort. Experience in hydrology and fisheries on the Bighorn NF since 2000, evaluating aquatic habitat and hydrologic conditions across the Forest, relative to management activities

Christopher Thomas – Forest Silviculturalist, Certified Forester #626

- B.S. Forestry from Michigan Technological University (1979).
- Certified Silviculturist since 1989; Certified Forester since 1997.
- Experience on the Ottawa, Rio Grande, Black Hills and Bighorn National Forests since 1980. Providing silvicultural input and evaluation of vegetative treatments.