

CERTIFICATION

I have reviewed the Annual Monitoring and Evaluation Report for the Bighorn National Forest for fiscal year 2000. I believe that the monitoring and evaluation requirements of the Forest Plan (Chapter IV) have been met and that decisions made in the Forest Plan are still valid. I have noted and considered the recommendations and will implement those that I decide are appropriate after further analysis and required public notification and involvement.

I am especially proud of the work accomplishments reported here. Fiscal Year 2000 proved to be a challenging year as we experienced change in both policy and direction from the Washington Office, along with the disruption of normal operations that accompanies a severe fire season. Some of our resource specialists were sent on special fire assignments to other agencies and National Forests. Despite budget constraints and shifting priorities, we, along with our cooperators and volunteers, accomplished a great deal of project work on the ground, where it ultimately counts.

/s/ William T. Bass

WILLIAM T. BASS
Forest Supervisor

June 18, 2001

Date

Table of Contents

<i>Certification</i>	<i>i</i>
INTRODUCTION.....	Page 1
Five-Year Monitoring Requirements	Page 2
Planning Activities.....	Page 2
Table of Projected and Actual Outputs	Page 7
Achieving Forest Plan Objectives.....	Page 10
MONITORING RESULTS	Page 11
A. PHYSICAL COMPONENTS	
Air Quality	Page 11
Soil and Water.....	Page 12
Fisheries.....	Page 13
Minerals	Page 16
Fire.....	Page 17
B. BIOLOGICAL COMPONENTS	
Wildlife	Page 19
Rare Plants	Page 28
Range	Page 29
Forest Vegetation	Page 48
Insects and Disease	Page 55
C. SOCIAL COMPONENTS	
Recreation	Page 58
Wilderness.....	Page 64
Visuals.....	Page 67
Heritage Resources.....	Page 69
Lands – Special Uses	Page 71
Facilities	Page 73
D. RECOMMENDATIONS	
Recommendations.....	Page 75
Research Needs Identified.....	Page 79
References	Page 80
List of Contributors	Page 81

INTRODUCTION

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

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

1. How well Forest Plan objectives have been met.
2. Consistency of activities with Standards and Guidelines contained in the Forest Plan.
3. The need for amendment or revision.

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

Monitoring is the quality control aspect of forest planning; therefore, it requires data collection and observations of activities to provide a basis for periodic evaluation of 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; they include:

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

Effectiveness monitoring determines if management activities are effective in driving the Forest toward the desired future condition described for the various management areas.

Validation Monitoring

Validation 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 as to what the monitoring results really mean with regard to implementation of the Forest Plan. 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 2000 is the 15th year of implementation for the Bighorn National Forest Plan. Specific items requiring a revision include:

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

This evaluation is included in the monitoring results for FY 2000. (See Below)

PLANNING ACTIVITIES

Forest Plan Revision

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

In fiscal year 1999, 11 Forests approaching the 15-year anniversary for approval of their Plans were once again funded for revision. The Bighorn was one of these Forests. In earnest, we began to refine our data needs and make necessary arrangements for supporting studies.

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

The following five major revision topics were proposed in the NOI:

- Biological Diversity
- Timber Suitability and Management of Forested Lands
- Roadless Area Allocation and Management
- Special Areas
- Travel Management and Dispersed Recreation

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

In October 2000, funding allowed us to once again begin this effort. An initial round of public meetings occurred in six towns surrounding the Forest. Efforts to continue the public involvement process are ongoing. To the greatest extent possible, all work completed as of this date, including prior studies and public comments, will be incorporated into the process and final product. The completion date for our revision is scheduled for 2004.

Forest Plan Amendments

The Forest Plan has been amended 14 times since it was approved in 1985. The amendments are summarized below and the changes in management area allocations resulting from the amendments are displayed at the end of these summaries in a table.

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

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

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

Forest Plan Amendment Four changed and improved some of the monitoring requirements for wildlife, range, soils, water, riparian, and fish habitat. The Forest Interdisciplinary Team had

discovered that some of the procedures and standards did not provide the best means for monitoring.

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

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

Forest Plan Amendment Seven replaced the seven-year regeneration standard with a five-year regeneration standard, which applied to final harvest of lodgepole pine. The amendment added additional Standards and Guidelines to be used in making a determination that regeneration could be assured within five years following final harvest. The amendment also made corrections to the lands designated as suited for timber harvest, reducing the amount of land suited for timber harvest by about 4,000 acres to 262,062 acres.

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

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

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

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

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

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

Forest Plan Amendment Fourteen changed the Cloud Peak Wilderness Area from four management areas to two, and revised or added 10 Standards and Guidelines for management. These fourteen amendments redistributed the management area allocations for 206 acres, which is .019 percent of the total Bighorn Forest.

The Following Management Area Summary Table displays the current Management Area allocations on the Bighorn National Forest.

MANAGEMENT AREA SUMMARY TABLE

MANAGEMENT AREA	EMPHASIS	ACRES ALLOCATED IN 1985 FOREST PLAN	CURRENT ALLOCATED ACRES
1-A*	Existing & Proposed Developed Recreation Facilities	913	935
1-B	Existing & Potential Winter Sports Sites	559	559
2-A	Semi-Primitive Motorized Recreation Opportunities	42,378	42,378
2-B	Rural & Roded Natural Recreation Opportunities	15,220	15,220
3-A	Semi-Primitive Nonmotorized Recreation Opportunities	44,660	44,660
3-B	Primitive Recreation in Unroded Areas	45,980	45,980
4-B*	Wildlife Habitat Management for One or More Management Indicator Species	206,237	206,104
4-D	Aspen Stand Management	11,171	11,171
5-A	Wildlife Winter Range in Non-forested Areas	15,500	15,500
5-B	Wildlife Winter Range in Forested Areas	10,153	10,153
6-A	Livestock Grazing, Improve Forage Condition	26,494	26,494
6-B	Livestock Grazing, Maintain Forage Condition	242,541	242,541
7-E*	Wood Fiber Production	202,500	202,442
8-A	Pristine Wilderness Opportunities	122,224	122,224
8-B	Primitive Wilderness Opportunities	45,352	45,352
8-C	Semi-primitive Wilderness Opportunities	27,493	27,493
8-D	Transition Wilderness Opportunities	424	427
9-A*	Riparian and Aquatic Ecosystem Management	11,744	11,729
9-B	Increase Water Yield	4,080	4,080
9-E*	Needed Water Impoundment Sites	0	184
10-A	Research Natural Areas	1,320	1,320
10-C	Scenic, Geologic, Historic, and Other Special Interest Areas	165	165
10-D	Wild and Scenic Rivers Corridors	30,559	30,559
	TOTAL FOREST ACRES	1,107,670	1,107,670

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

2000 MONITORING FIELD TRIP

Annual Monitoring Field Trip:

Traditionally, the Forest conducts a monitoring field trip each year to review specific projects and make recommendations for Plan and/or project improvements. Due to the adverse fire conditions and availability of personnel, this formal review was deferred to the 2001 summer season. Nevertheless, the Forest Leadership team, along with several specialists, reviewed travel management concerns and the dispersed recreation program at several locations throughout the Forest. Objectives included:

- Brief Leadership Team (several new members) on visitor demographics.
- Discuss resource impacts caused by dispersed camping.
- Highlight concerns on off-road travel and use of the Forest transportation system.
- Brainstorm ideas for management of the Forest dispersed recreation program. Highlight issues for Forest Plan Revision.

The Forest Leadership team visited areas on the Powder River Ranger District, north of Buffalo, and the Tongue Ranger District, near the Woodrock Guard Station.

Conclusions:

- Dispersed use, especially camping, has significantly increased in the last 5-10 years.
- Designation of trail systems as motorized and/or non-motorized, although being consistent with management prescriptions, may not make logical sense. At times trail segments are classified in a category that prevents their effective use (e.g., it may be impossible to reach a segment of motorized trail without violating a use regulation on a non-motorized component).
- Dispersed campsites at some sensitive locations, especially riparian environments, result in unacceptable environmental impacts (bank/stream erosion, vegetation damage).
- Some existing roads are not adequately marked nor do they appear on the existing Travel Map, making it difficult to know actual restrictions.

TABLE OF PROJECTED AND ACTUAL OUTPUTS

The following table displays projected Forest Plan average annual outputs, costs, and returns to actual Fiscal Year 2000 accomplishments. A direct comparison of projected outputs is not always appropriate due to variables such as allocated budgets.

Table III-1

Activity	Unit of Measure	1991-2000 Avg. Annual Projected Outputs	FY 2000 Outputs
SOILS			
Soil and Water Resource Improvements (i.e., improved watershed condition)	Acres	38.5	40
Annual Soil Survey	Acres	Not Estimated	Completed
Soil Loss (incremental increase due to timber harvest and road construction)	M tons	9.3	~
WATER			
Water Yield	MAF	699	699
Water Meeting Water Quality Goals	MAF	Not Estimated	~
Water Not Meeting Water Quality Goals	MAF	Not Estimated	~
MINERALS			
Leasing Availability Recommendations			0
-No Lease	M Acres	211.98	0
-Lease	M Acres	723.84	0
-Lease Without Surface	MAcres	171.85	0
Minerals Operating Plans	Total Number	5	23
FIRE			
Fire Management -Most Efficient Level	Million \$'s	1.16	.442
Fuels Breaks and Natural Fuels	Acres	300	590
WILDLIFE AND FISH			
Wildlife Habitat Improvement	Acres	2,560	1,887
Big Game Winter Range Carrying Capacity			
- Elk	Number	527	527
- Deer	Number	1,053	1,053
Riparian Area Improvement	Acres Improved Annually		30
Aspen Treatment	Acres	527	1
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	10

Activity	Unit of Measure	1991-2000 Avg. Annual Projected Outputs	FY 2000 Outputs
Wildlife Structures	Structures Constructed Annually	15	5
Threatened and/or Endangered Species Habitat Management	Number of Animals	0	2
RANGE			
Permitted Livestock Grazing	MAUM'S	140	132.8
Areas of Grazing, Recreation & Wildlife Conflicts Where Conflict are Reduced	M Acres (Cumulative totals rather than annual outputs)	22	58
TIMBER			
Total Programmed Sale Volume Offered	Million BF	16.4	4.23
Total Programmed Sale Volume Offered	Million CF	4.2	.84
Sawtimber Volume (7'+)	Million BF	14.5	2.76
Sawtimber Volume (7"+)	Million CF	3.8	.57
Roundwood Volume Offered (live 5" - 6.5")	Million BF	0.5	.15
Roundwood Volume Offered (live 5" - 6.5")	Million CF	0.08	.02
Mortality Volume	Million BF	1.4	1.32
Mortality Volume	Million CF	0.37	.24
Timber Stand Improvement	Acres	400	678
Reforestation (planting and seeding)	Acres	360	264
Clearcutting	Acres	1,194	0
Shelterwood Cutting	Acres	625	507
Uneven-aged Selection Cutting	Acres	100	0
Catastrophic Salvage	Acres	0	0
INSECTS AND DISEASE			
Insect and Disease Survey	M Acres	800	250
DEVELOPED RECREATION			
Developed Recreation Capacity (except downhill skiing)	MRVD's	1,137	1,109
Developed Recreation Use (including visitor information services, not including downhill skiing)	MRVD's	735	667
Subcategories of Developed Recreation			
Developed Recreation Capacity, public sector	MRVD's	592	614
Developed Recreation Use, public sector	MRVD's	490	407
Developed Recreation Capacity, private Sector (except downhill Skiing)	MRVD's	545	495
Developed Recreation Use, private Sector (except downhill Skiing)	MRVD's	245	260
DOWNHILL SKIING			
Downhill Skiing Capacity	MRVD's	25	25
Downhill Ski Use	MRVD's	18	9

Activity	Unit of Measure	1991-2000 Avg. Annual Projected Outputs	FY 2000 Outputs
DISPERSED RECREATION			
Total Dispersed Recreation Capacity (not including wilderness)	MRVD's	2,163	2,174
Total Dispersed Recreation Use (not including Wilderness)	MRVD's	1,063	899
Dispersed Recreation Capacity by Recreation Opportunity Spectrum Setting			
Primitive & Semi Primitive Nonmotorized Setting (outside of wilderness)	MRVD's	215	215
Semi-Primitive Motorized Setting	MRVD's	311	311
Roaded Natural and Rural Setting	MRVD'Ss	1,648	1,648
Dispersed Recreation Use by Recreation Opportunity Spectrum Setting			
Primitive & Semi Primitive Nonmotorized Setting (outside of wilderness)	MRVD's	129	54
Semi-Primitive Motorized Setting	MRVD's	290	216
Roaded Natural and Rural Setting	MRVD'Ss	644	629
Number of Trailheads with Access for all Classes of Vehicles (incremental over pervious period)	Total number (1978-1998)	Not Estimated	Not Estimated
Trail Construction/reconstruction	Miles	2.9	0
WILDERNESS			
Wilderness Management	Acres	189,000	189,000
Wilderness Capacity	MRVD's	124	124
Wilderness Use	MRVD's	110	70.5
LANDS			
Land Purchase and Acquisition	Acres	Not Estimated	0
Land Exchange Offers	Acres	Not Estimated	3
Right-of-Way Acquisitions	Total Cases Each Period	0	0
Occupancy Trespass	Cases	4	1
Landline Location	Miles	38	3
FACILITIES			
Road Construction			
- Arterials	Miles	1.9	0
- Local Roads	Miles	18	0
Road Reconstruction			
- Arterials	Miles	1.9	0
- Local Roads	Miles	8	7.3
HUMAN AND COMMUNITY DEVELOPMENT			
Human Resource program (includes al programs except YCC and Job Corp)	Enrollee years	12	5.6
Job Corp	Enrollee years	Not estimated	~

Activity	Unit of Measure	1991-2000 Avg. Annual Projected Outputs	FY 2000 Outputs
EXPENDITURES			
Operation and Maintenance	Million Dollars	6.16	6.16
Capital Investment	Million Dollars	2.15	0.27
General Administration	Million Dollars	1.26	1.75
Long Range Fixed Costs	Million Dollars	0.76	0.44
Total Budget	Million Dollars	10.33	8.62
RETURNS TO TREASURY			
Returns to Treasury	Million Dollars	2.16	0.66

ACHIEVING OBJECTIVES OF THE FOREST PLAN

A review of the Table of Projected and Actual Outputs will indicate variability in accomplishments. Outputs often vary substantially from year to year as funding levels change. The trends in various resource areas over a three- to five-year period are a better reflection of whether or not 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 our funds often reflects national direction and priorities of the administration and Congress. Traditionally, we have been funded at a level significantly below what was projected to implement the Forest Plan. The fiscal year 2000 funding level was approximately 80 percent of our projected need. However, the dollars were not adequately distributed to meet the needs for individual program areas.

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

MONITORING RESULTS

A. PHYSICAL COMPONENTS

INTRODUCTION

This report describes the various monitoring and target accomplishments completed by the Bighorn National Forest aquatics group. The Forest aquatics program encompasses the individual soil, air, water, fish, and minerals programs.

The Forest aquatics program expanded this year by adding a new Fisheries Biologist position. Dan Scaife was hired as a Fisheries Biologist trainee and brings with him skills in both GIS and hydrology. Dan's interdisciplinary skills will be invaluable in the upcoming Forest Plan revision and Natural Resource Inventory Survey implementation.

AIR QUALITY

Program Summary

The 189,000-acre Cloud Peak Wilderness is a Class II air shed that is subject to protection 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.

IMPLEMENTATION MONITORING

MONITORING REQUIREMENT:

Air Quality

A camera to monitor visibility was installed on Grouse Mountain early in the summer of 1995. The purpose of the camera is to monitor the long-term air resource of the Cloud Peak Wilderness. Two photographs are taken daily of Mather Peaks. These photographs are analyzed to determine whether or not there has been an increase in particulate matter over time.

The Forest is currently working with the State of Wyoming to place an automated air quality monitoring station on Hunter Mesa. This station would replace the existing visibility camera and is expected to be operational by the end of FY 01.

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 the burn event, a prescribed fire plan is approved by the Forest Supervisor, and a request for burn permit is filed with the Wyoming Department of Environmental Quality – Air Quality office. The request for permit is accompanied by burn data that includes the number of

acres to be burned, type of fuels, and a SASEM report, which predicts the amount of particulate matter to be produced and models smoke drift under various weather conditions. Upon approval of the permit, a weather forecast is obtained the day prior to, or the day of the actual burn for predicted smoke/fire behavior and weather conditions. Monitoring of wind direction and smoke dispersal is performed during the prescribed burn to ensure compliance with air quality regulations.

SOIL AND WATER Program Summary

Water quality across the Forest ranges from severely degraded to pristine, with the overall water quality generally considered to be good. The most common cause for degradation of water quality is chronic sediment delivery from roads, stream crossings, and channel scour.

The condition of riparian areas across the Forest ranges from severely 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 (BMP's) 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.

Other impacts to water quality and riparian health come from recreation, off-road travel, and roads. Timber sale BMP reviews show that when Best Management Practices are properly applied there is no detectable change in water quality or riparian health.

MONITORING REQUIREMENTS:

Ground Disturbing Activities That Have the Potential to Alter Soil Productivity - Water Quality

FY00 TARGET - Soil and Water Resource Improvement

Measurement Unit	FY 00 Target	FY 00 Accomplishment
Acres	20	20

This includes acres treated with improvement measures to increase the quality and quantity of water, and maintain or improve soil productivity in accordance with land management plans.

As part of the Tongue watershed analysis, the aquatics team inventoried 54 stream crossings within the 110,000-acre watershed. The findings showed that 80% of all stream crossings in the watershed are long-term sources of sediment. From the watershed analysis, it was found that the major non-point source pollutant in the basin was fine sediment. Therefore, upgrading stream crossings and improving BMP's on roads in the watershed became the number one soil and water improvement priority.

In FY00, the Forest spent \$50,000 to order new culverts that will be installed in FY01. Another \$100,000 is planned for installation and BMP construction in FY01. Road and stream crossing inventories are now a regular part of the aquatics watershed analysis procedure. The Forest has a summary document prepared that describes the conditions and contains pictures of each crossing in the Tongue watershed.



An example of a poor stream crossing in the South Tongue watershed.

FISHERIES

Program Summary

Managing for native and non-native game fish is a priority on the Forest. Currently, the Bighorn has one sub-species of native cutthroat trout (Yellowstone cutthroat) that is listed as sensitive. The aquatics group has been working cooperatively with the Wyoming Game and Fish Department to monitor and inventory fish populations across the Forest. To date, the Forest has helped fund and support four graduate students to inventory and monitor Yellowstone cutthroat populations, as well as water quality and riparian conditions on the Bighorn National Forest. Once the populations are found, habitat improvement and recovery efforts will soon follow.

MONITORING REQUIREMENT:

Fish/Riparian Habitat Rating

FY00 TARGET - Riverine Stream Reach or Channel Unit Scale Inventory

Measurement Unit	FY 00 Target	FY 00 Accomplishment
Miles	20	418

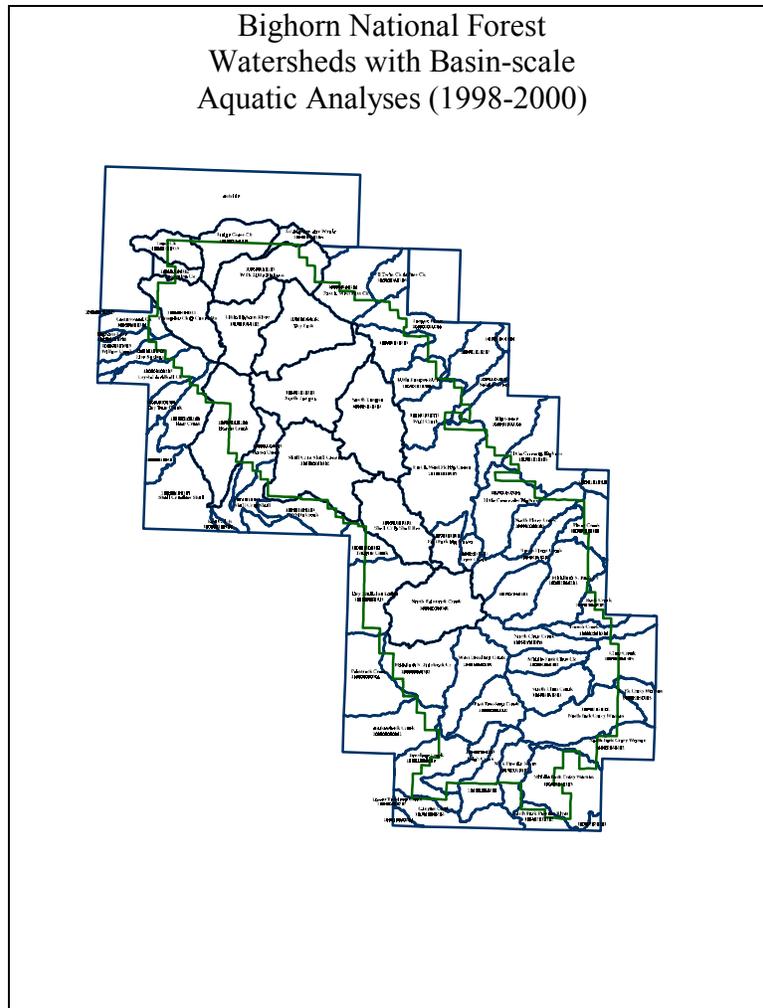
This item relates to the number of stream miles for which maps and/or descriptions have been accomplished during the past year. During FY00, the aquatics team, in conjunction with the University of Wyoming, inventoried and/or described hydrologic and aquatic conditions on over 400 miles of stream channel across the Forest. The accomplished miles are so much higher than the projected target as a result of improved GIS capabilities, and a sampling design that allows us to extrapolate conditions based on stream type.

Reach level aquatic inventories were conducted as part of large-scale watershed analyses for range allotment revisions. The inventories were done using stratified sampling of stream reaches classified during the 1998 Integrated Resource Inventory (IRI). Once the distribution of stream types was known from IRI maps, the crew sampled reaches that were known to be in reference or impacted condition. The inventories were conducted using the R1/R4 Fish Habitat Inventory Protocol. Information was then extrapolated across the watershed based on stream type and condition class.

The following watersheds were inventoried during FY99 and/or FY00:

- ❖ Little Bighorn Watershed (UW Master's Thesis)
- ❖ Canyon Creek (FY00/FY01)
- ❖ North and South Tongue Watersheds
- ❖ Shell Creek (FY99/FY00)

The watersheds inventoried for aquatic conditions in FY98 through FY00 comprise approximately 510,000 acres or 48% of the Bighorn National Forest.



FY00 TARGET - Stream Aquatic Biota Inventory

Measurement Unit	FY 00 Target	FY 00 Accomplishment
Miles	8	14

This target refers to the creation of a formally documented, stream-related data gathering/collection process that addresses issues and decisions associated with land management actions. The inventory provides an assessment of the distribution and condition of aquatic resources, and is integrated into the planning, analysis, and execution of projects and activities on the Forest, such as roads analysis, forest planning, and NEPA.

This information was collected as part of large-scale watershed analyses. Data on the abundance and distribution of aquatic plants and fish was collected using snorkeling and electrofishing techniques.

- ❖ Little Bighorn Watershed (Master’s Thesis project)
- ❖ Canyon Creek (FY00/FY01)
- ❖ North and South Tongue Watersheds
- ❖ Shell Creek (FY99/FY00)

FY00 TARGET - Landscape/Watershed Scale Assessments

Measurement Unit	FY 00 Target	FY 00 Accomplishment
Assessments	1	4

Assessments are characterizations of ecosystems above the project level that provide information relevant to land management decisions. During FY00, the aquatics group completed watershed analyses on several large watersheds across the Forest. The projects completed during FY00 were:

- ❖ Little Bighorn Watershed
- ❖ Hunter Creek (Watershed Plan Completed by State of Wyoming)
- ❖ North and South Tongue Watersheds
- ❖ Shell Canyon

**MONITORING REQUIREMENT:
Fish Population Trends**

During FY99 and FY00, the Forest co-sponsored inventories of populations of Yellowstone cutthroat trout. These inventories were conducted by graduate students with the intent of filling in data gaps identified by the Wyoming Game and Fish Department. The Forest has a Powerpoint slide show of the work done to date on the Yellowstone cutthroat trout. The following watersheds have been inventoried over the last two years:

- ❖ Little Bighorn
- ❖ South Fork Paintrock Creek
- ❖ Cedar Creek
- ❖ North and South Beaver Creek
- ❖ Deer Creek
- ❖ Trout Creek

FY00 TARGET - Inland Fish Lakes Restored/Protected

Measurement Unit	FY 00 Target	FY 00 Accomplishment
Acres	6	3

This measure reports the surface acres of inland fish bearing lakes, ponds, and reservoirs that were enhanced using structural or non-structural improvements. These restoration/enhancement activities address features limiting the productive capability of a body of water, for the express purpose of improving fish habitat.

In FY00, Casey’s Pond in the Shell Creek watershed was enlarged and deepened in order to facilitate overwinter survival of catchable trout. This project was done in cooperation with Wyoming Game and Fish and the Natural Resource Conservation Service.

FY00 TARGET - Inland Fish Streams Restored or Enhanced

Measurement Unit	FY 00 Target	FY 00 Accomplishment
Miles	10	10

This measure reports the miles of inland fish bearing rivers and streams that were restored or enhanced using structural or non-structural improvements. The restoration/enhancement activities address features limiting the productive capability of a body of water, for the express purpose of improving fish habitat.

In FY00, streams were protected with construction and maintenance of riparian exclosures, along with implementing changes in riparian grazing strategies. These activities were conducted across the Forest as part of allotment management plan revisions.

MINERALS

MONITORING REQUIREMENT:

Compliance With Terms of Operating Plans and Consistency with Plan

FY00 TARGET - Non-Bonded Non-Energy Operations Processed

Measurement Unit	FY 00 Target	FY 00 Accomplishment
Operations	25	23

This report contains the number of operations processed that did not require a reclamation bond, such as Plans of Operations for which bond requirements were waived, Notices of Intent, or free-use mineral material permits for the public. Accomplishment is reported when an operation plan is processed to a decision. There is a decision document signed by a line officer in the file that verifies each operation reported as processed.

Other Projects

The aquatics crew provides support to other functions on the Forest. This year the team supported the Swamp, Woodrock, and Sourdough timber NEPA projects. We also supported the Tongue and Devil's Canyon grazing allotment revision plans. During this unusually severe fire season, the team provided up to a month of time individually supporting fire suppression efforts across the Region.

A very important addition to the program this year was the addition of a new Fisheries Biologist trainee position. This position was funded via a national emphasis to recruit new biologists into the agency. We hired Dan Scaife, who has extensive field experience in fisheries, hydrology, and GIS. Dan brings skills to the program that will help us implement NRIS and further integrate fisheries and hydrology into the Forest program.

Plans for Next Year (FY 2001)

The next fiscal year is expected to bring new challenges to the program. For example, the Forest will be beginning the Forest Plan revision process. The revision will consume a large percentage of our time during the coming fiscal year. Another large effort that the program will be expected to support will be the National Fire Management initiative. As of now the amount of work

required to support this effort is unknown, however, all indications suggest that this initiative could require additional people to accomplish the intended results.

During FY01 we will be completing channel and riparian restoration work on one mile of the South Tongue River near Dead Swede Campground. This site will be used as a demonstration project with Wyoming Game and Fish to show how fish and water objectives can be used to restore the structure and function of a large fishery stream on the Forest.

Effectiveness Monitoring

Forest Plan Standards and Guidelines are addressed during project planning, however, during project implementation they may not always be reviewed due to time and personnel limitations. Project monitoring where Standards and Guidelines and Best Management Practices have been implemented demonstrates that Forest Plan direction will protect the soil and water resources.

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

Validation Monitoring

The difference between natural erosion and erosion resulting from management activities needs to be defined. In addition, a concerted effort needs to be made to ensure that Standards and Guidelines are being met at the project level.

FIRE Program Summary

The Forest fire management organization has completed three levels of the National Fire Management Analysis System (NFMAS) and implemented the fourth level of monitoring and evaluation. NFMAS is an economic planning tool used to help fire managers in the planning and analysis of fire programs. An evaluation of program costs, complexity, targets, and alternatives are some of the factors that are used in determining the most efficient fire program recommendations that are compatible with available funding.

Implementation of NFMAS on the Bighorn National Forest began in 1992, and Regional certification was received in 1996. A reanalysis of the Bighorn's fire program began in 1997, and upon completion, we received Regional certification in December 1998. The results of the reanalysis strengthened the fire and fuels management programs, and increased the coverage for Forest engines from five to seven days. The Most Efficient Level of operations was at \$1,160,000. The increase in funding reflects the change in resources coverage levels, which were updated to provide coverage seven days per week.

The classic wildland-urban interface does not typically apply to the Bighorn fire program, as there are only 7,400 acres of alienated lands within the Forest boundary. However, the complexity of protection and suppression efforts is increased with the presence of 265 special use summer homes, 13 special use lodges, and two ski areas scattered throughout the Forest. Our fire history indicates that special use and private structures have been periodically threatened or burned.

Funding for fiscal year 2000 was 54 percent below MEL (Minimum Efficient Level). Funding for program leadership provided for a Staff Officer, Forest Fire Management Officer, a West Side Zone Fire Management Officer, an East Side Zone Fire Management Officer, and an Assistant East Side Zone Fire Management Officer. There is a need for an assistant for the West Side. Dispatching for initial attack is provided by the Cody Dispatch Center in Cody, Wyoming. The hand and engine crews were funded for 50% of the fire season.

Fire occurrence in 2000 represented an average year. Fire restrictions kept the person-caused fires to a minimum during the dry period from the end of July to the middle of September. There were 16 fires that burned a total of 8 acres during calendar year. Eight of the fires were lightning-caused. Eight fires were person-caused. The 2000 fire danger was moderate-to-high early in the fire season, and a lack of precipitation from early June until mid-September kept the heavy fuels very dry. The fire danger ranged from very high to extreme from July to September - a record year on the National Fire Danger Rating System. The Forest and surrounding area was tinder dry, but the Bighorns managed to elude having a large fire event.

There was one large fire outside the Forest boundary (near the Powder River District) that threatened homes and the Forest. A quick response by the Forest, BLM and Johnson County Volunteers kept the fire in check and saved a couple of cabins from burning. Rain in the middle of September lowered the fire danger to the moderate rating. This helped us complete some prescribed burning of clear cuts before the snow ended broadcast burning in early October 2000.

IMPLEMENTATION MONITORING

MONITORING REQUIREMENT:

Fuel Treatment of Activity Fuels

The Forest accomplished treatment of 590 acres with prescribed burning and piling for fiscal year 2000. Prescribed burning projects included burning 590 acres of fuels, five clear-cut units in Schuler Timber Sale, and various pile burning throughout the Forest to reduce the backlog of past hand and machine piles. Due to the drought conditions and a nation-wide halt to prescribed fire activities, the Forest was not able to complete its assigned target.

Effectiveness Monitoring

The fire organization is a team effort between the east and west zones. Cody Dispatch Center is responsible for initial attack dispatching. We hired 18 firefighters with the available funds. The crew was fully staffed for the 1999 summer fire season.

Fire restrictions and a minimum of lightning kept fire occurrences low in July, August, and September. Because of the extreme fire danger, work was limited to projects that could be completed without compromising response time. Crews were in a constant state of readiness along with the CWN helicopter crew stationed at Worland.

Evaluation and Conclusions

The Assistant West Side Zone Fire Management Officer position was not filled due to the lack of funding. One Engine Operator was hired at Burgess Ranger Station. Two Engine Operator positions at Tyrell RS and Shell Work Center are being recruited due to transfers. The Forest has signed an agreement with the Bighorn Canyon National Recreation Area to provide assistance with their fire management program. The zones have worked very well together in exchanging and sharing fire resources for initial attack and project work.

Radio communications is an on-going issue, but improvements have been made and are continuing. Radio communications are sometimes poor because of inadequate coverage and equipment limitations. Equipment was installed at the Cody Dispatch Center and this was the second summer that the Center was able to dispatch units on the Forest (though there were still problems). Adjustments have been made with cell phones, human repeaters, and local offices to provide safe and effective communications. A new system should be in place by next summer.

Forest Plan direction for fire management is very general. The Standards and Guidelines provide limited direction for fire management, while the Fire Management Action Plan has been written to provide specific fire management direction for suppression in the management areas. Preliminary data and mapping projects have continued to prepare for the upcoming Forest Plan revision.

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

B. BIOLOGICAL COMPONENTS

WILDLIFE Program Summary

A Forest-wide overlay of lynx habitats (denning, forage, and travel) was constructed during FY 2000. This mapping project was conducted in cooperation with the U.S. Fish and Wildlife Service and resulted in the delineation of six Lynx Analysis Units across the Forest.

The Bighorn National Forest was selected to conduct a lynx survey following the National Lynx Detection Protocol. Our survey grid is Number 63 out of 66 surveys currently being conducted nation-wide. This survey requires three consecutive years of data collection, and will be continued in FY 2001 and FY 2002. To date, no lynx have been found on the Bighorn National Forest as a result of this survey. A total of 64,000 acres of potential lynx habitat was surveyed, requiring approximately 45 man-days to complete, including prep time and coordination (35 days in the field).

The success of seeding and rehabilitation work was not monitored in the Stockwell Fire. In 1996, rehabilitation work was accomplished on the Stumpy Ridge road and some seeding was done near the Little Goose Peak Mine. The mine area was not checked during 2000, and the status of rehabilitation efforts is unknown at this time.

Also, monitoring for success of reseeded and other rehab work was not conducted at the Marcum Creek rehab site, the Copper Creek crossing, and the Shutt's Flat road, due to a loss of labor force to wildfires.

Monitoring of prescribed burns did not take place during FY 2000. The specific burns to be monitored included Kerns, Tongue Canyon, and Dry Fork/Skull Ridge. Monitoring did not occur due to loss of manpower to the wildfire fighting effort.

All Aspen exclosures on the Tongue District, and the District previously known as Buffalo, were maintained during 2000. The individual exclosures are listed below and total 51 acres.

N. Tongue - 2 exclosures, 4 acres Marcum Creek - 1 exclosure, 5 acres P.K. - 3 exclosures, 10 acres Sheeley cabin - 1 exclosure, 3 acres Hay Creek - 5 exclosures, 20 acres Dry Fork - 2 exclosures, 4 acres, Camp Creek - 1 exclosure, 1 acre, Billy Creek - 1 exclosure, 1 acre, Billy Creek II - 1 exclosure, 3 acres, #2 Aspen - 1 exclosure, 0.1 acre.

Six bat houses were monitored this year. The plan was to monitor all houses at least twice each month - once during daylight hours and once after dark. Time constraints did not allow for sufficient monitoring, and most houses were only checked twice during the summer and only during daylight hours. The one at the Sheridan Work Center contained two unknown species of myotis. The two bats occupying this house were originally reported as Western small-footed myotis, which is a Wyoming Game and Fish sensitive species, but upon checking with bat experts from Wyoming Game and Fish, the recording was changed to unknown myotis species until identification can be verified. The bat house at Big Goose Ranger Station contained one little brown myotis; this is consistent with the results from 1998 and 1999. The bat house at Hunter Ranger Station contained one Townsend's big-eared bat (a Sensitive species) during 1998, but was not occupied during 1999 or 2000. The other three bat houses were also not used this year. One bat house had to be moved from the Sheridan Forest Service Office to the Porcupine Ranger Station. The bat house was not erected on the new site until late in the season, and it is not surprising that no bats occupied the structure last summer.

A total of 119 bluebird houses on the Tongue District were monitored this year using volunteers from the Sheridan Chapter of the Audubon Society and John Kraft, an individual volunteer. Nesting success was about average, but down from the previous year, and seemed to be related to the cold, wet weather conditions during the nesting season. Also, the results from the 1999 nesting study were tabulated. Results were sent to all volunteers and to the North American Bluebird Society. Many of the boxes have been exposed to weather for 8 to 10 years now, and most have deteriorated to the point that repairs are not feasible. We will need to look for opportunities to have new boxes built and begin to replace boxes as needed. A few students at the Sheridan Junior High School have shown an interest in building bluebird boxes as a class project, and then donating the finished boxes to the Forest Service to be used as replacements. This strategy should enable us to maintain our present number of boxes with very little cost to the taxpayer.

Modifications were made to the swallow condos at Burgess Ranger Station, as the original construction may have placed the tiers too close together. The bottom two rows were the only ones being utilized by nesting swallows. Prior to this year, one tier was removed at the Burgess pond site and the middle tier was reset to allow more space between the remaining 3 tiers. The condo by the Burgess washhouse has never been used by cliff swallows. The 2nd and 4th tier were removed to allow more flight space between the remaining two tiers. This work was accomplished in late August 1999. Monitoring during the 2000 field season showed that the increased spacing between tiers had no effect in getting the swallows to accept the upper tiers. Also, the flagging that was hung from the rafter ends failed to discourage swallows from nesting on the cabins. For FY 2001, we also need to make a concentrated effort to make the cabins at Burgess inhospitable and to encourage swallows to use the condo instead. There are now 3 "surplus" tiers, which could be used to build a new swallow condo somewhere else, probably as

single units in the Burgess horse pasture. We will stretch plastic netting over the cabins in those areas where swallows have historically built nests.

Snow track surveys for forest carnivores (pine marten, lynx, wolverine) were conducted on the Tongue District. A total of 50 miles of transect (6,400 acres) were surveyed in the Burgess area, no tracks of target species were found.

No osprey sightings were recorded in FY 2000, and no surveys were conducted to attempt to locate an active nest. Past sightings in the vicinity of Park Reservoir raise the question of whether an active osprey nest may be in the vicinity. A volunteer committed to watching for osprey activity in the Park Reservoir area this past summer, but failed to report back to the Forest Service, and could not be reached by phone. No Forest Service funding was available for this effort.

Surveys for boreal owls were not conducted on the Tongue District during the spring nesting season due to lack of funding and lack of time.

No active goshawk nests were observed in the East Zone during the 2000 nesting season. The alternate nests adjacent to the proposed Sourdough Timber Sale were surveyed during FY 2000, and no goshawk activity was observed.

Work was conducted with Dr. Marion Klaus, a professor at Sheridan Community College, on her ongoing water vole studies. There were several meetings with Dr. Klaus and her research assistants to coordinate locations to compare ungrazed areas with grazed. In addition, surveys for presence of water voles were started in the North Tongue drainage. No new occupied areas were recorded. This work will continue during the FY 2001 summer season as part of the analysis for the North Tongue Grazing AMP Environmental Assessment. An area representing 700 acres of potential water vole habitat was surveyed in 2000.

Applications were received on the Forest to nominate four caves on the Tongue Ranger District as “significant”, which would place them under jurisdiction of the Cave Resources Protection Act. No action has been taken on those nominations. All four caves on the Tongue Ranger District meet the criteria to be listed as “significant” caves.

Surveys were not conducted for amphibians in the Hazelton area of the Powder River Ranger District. Surveys are scheduled to resume in 2001.

Wildlife support was provided for the following environmental analyses:

- Sourdough Timber Sale
- East Slope Prescribed Burn Project
- L. Horn Prescribed Burn Project
- Swamp Timber Sale
- North Tongue Grazing AMP
- Woodrock Timber Sale

Sightings of Threatened and Endangered Species (TES) and other significant wildlife species were recorded on the Tongue and Powder River Ranger Districts and were reported to the Wyoming Observation System, which is maintained by Wyoming Game and Fish Department, and to the Wyoming Natural Diversity Database, which is maintained by the University of Wyoming. These sightings are considered to be sensitive information and are not available to the general public. The recordings are mentioned here only to show that the Forest is tracking and recording all verified TES sightings.

**MONITORING REQUIREMENT:
Management Indicator Species**

Biological Evaluations and Specialist Reports were completed or are in the process of being completed for activities planned and/or executed on the eastside of the Forest, including L. Horn Prescribed Burn, Sourdough Timber Sale, Woodrock Timber Sale, Swamp Timber Sale, and the North Tongue Grazing AMP EA.

Aspen: Previously established transects and photo points are used to monitor and partition use of aspen between domestic livestock and wildlife.

Spot checks and photo points were taken at the following aspen stands during the 2000 field season: Upper Medicine Lodge Canyon on the Forks Allotment, the aspen stand in the Lower Pasture in the Granite Allotment, and the three aspen stands in the Lower Shell Pasture of the Shell Creek Allotment.

Permanent transects in East Cement, Toe of Cement, West Cement and Upper Woodchuck on the Paintrock Allotment were not read during the 2000 field season. The aspen stand on Middle Fork of Paintrock Creek, which contains a permanent photo point and line intercept transect, appears to have died over the winter (between fall 1999 and summer 2000). The majority of trees throughout the entire clone have an orange staining to the bark and many appear to be dying or dead.

Willow: Previously established transects and photo points are used to monitor and partition use of willow between domestic livestock and wildlife.

The following transects were set, read, and photographed twice during the 2000 field season: Buckley Creek #1 and #2, and Sheep Creek #1 and #2 and #3. Additional willow photo points were monitored on Crooked Creek, Trapper Creek, and Jack Creek. Results can be found within the Range narrative portion of this report.

Water Voles: From 1997-August 2000, surveys for Water Voles have been conducted by Dr. Marion Klaus of Sheridan College on the Bighorn National Forest. On the west side of the Bighorn National Forest, several previously established sites were sampled during the 2000 field season (as well as three new established sites) to continue monitoring the effects of livestock grazing on water vole populations. Canopy coverage analysis of riparian vegetation was also documented at each live trapping location.

Elk: The following information is based upon 1999 Herd Unit Reports produced by the Wyoming Game and Fish Department. Population levels are largely managed by hunting, but are also limited by the amount of winter range available and the severity of the winters. The 2000-2001 winter was another mild winter and populations should continue to flourish.

This species is resident to the Forest, common, and population levels are managed intensively by the Wyoming Game and Fish in three separate big game herd units, including the North Bighorn, Medicine Lodge, and South Bighorn units. Several hunt areas are identified within each herd unit. The majority of the Forest falls within the North Bighorn herd unit, followed by the Medicine Lodge, with minimal presence of Forest lands within the South Bighorn unit. The

population objective for the North Bighorn unit is for 4,100 elk, with current post-harvest population data showing 4,955 animals for 1999.

Predicted population levels for the 2000 post-season analysis were for 4,500 animals. Specific hunt area trends are as follows: Area 37 is currently in an upward trend from past levels at approximately 821 animals; Area 38 trend is currently down from past levels at approximately 951 animals. No other hunt areas were analyzed by the Game and Fish in this herd unit.

The population objective for the Medicine Lodge herd unit is for 3,000 animals, with current post-harvest population data showing 3,500 animals for 1999 (WYG&F 1999). Predicted population levels for the 2000 post-season analysis were for 3,350 animals. The population has remained constant in this herd unit (within 500 animals of the objective) for the past several years. Specific hunt area trends are as follows: Area 45 is currently at 846 elk; Area 42 at 1,656 elk; Area 41 has 382 animals.

No specific habitat monitoring for elk occurs on the Forest. Winter range off the Forest is monitored occasionally by the Game and Fish to assess habitat conditions.

Mule Deer: The following information is based upon 1999 Herd Unit Reports produced by the Wyoming Game and Fish Department. Population levels are largely managed by hunting, but are also limited by the amount of winter range available and the severity of the winters. The 2000-2001 winter was another mild winter and populations should continue to flourish.

This species is resident to the Forest, common, and population levels are managed intensively by the Wyoming Game and Fish in two separate big game herd units, including the North Bighorn and Paintrock units. Several hunt areas are identified within each herd unit. The majority of the Forest falls within the North Bighorn herd unit, followed by the Paintrock. The population objective for the North Bighorn herd unit is for 25,000 animals, with current post-harvest population data showing 22,826 animals for 1999. Predicted population levels for the 2000 post-season analysis were to exceed the objectives at 25,500. Harvest units 50, 53, 25, and 28 represent the majority of the Forest habitat. Population levels on 50 and 53 were assessed at 387 and 759 animals, respectively, however no data was available for units 25 and 28 due to winter range migration.

The population objective for the Paintrock unit is for 13,000 deer, with current post-harvest population data showing 12,100 animals for 1999. Predicted population levels for the 2000 post-season analysis were to exceed the objective at 13,900. Harvest units 46 and 48 represent the majority of the Forest habitat, and populations are not well assessed on these two units due to winter range migration.

No specific habitat monitoring for deer occurs on the Forest. Winter range off the Forest is monitored occasionally by the Game and Fish to assess habitat conditions.

Moose: The following information is based upon 1999 Herd Unit Reports produced by the Wyoming Game and Fish Department. Population levels are largely managed by hunting, but are also limited by the amount of winter range available and the severity of the winters. The 2000-2001 winter was another mild winter and populations should continue to flourish.

This species is resident to the Forest, common, and population levels are managed by the Wyoming Game and Fish in one big game herd unit, known as the Bighorn unit. Four hunt areas are identified within the herd unit, including 1, 34, 42, and 43. The herd unit is largely comprised of Forest habitat. A minimum population of 163 animals was estimated through 1999

surveys. The population objective for the Bighorn herd unit is for 500 animals. Moose can be difficult to survey due to their use of forested habitats. Populations are estimated to be increasing.

Bighorn Sheep: Bighorn sheep have been transplanted onto the western side of the Forest in numerous attempts at establishing a population. All attempts are considered to be unsuccessful, as a population of approximately 20 sheep are all that persist in the Shell Canyon area.

MONITORING REQUIREMENT:

Peregrine Falcon Occupancy

No peregrine nesting activity was observed on the east slope of the Bighorns during the 2000 field season.

No peregrine nesting activity was observed on the west side of the Bighorns during FY 2000. Since release efforts in 1993, active aeries have been documented in areas near Shell Canyon and Tensleep Canyon on the west side of Bighorn National Forest.

MONITORING REQUIREMENT:

Wildlife habitat diversity

Monitoring of willows in the Big Goose area did not occur in FY 2000. This monitoring project was started in 1976, and photos have been taken every 5 years at permanent photo points. This work was not accomplished this year due to drought conditions (not a fair comparison) and fire activity (personnel being redirected to fight wildfires in Wyoming). Monitoring has been rescheduled for mid-August 2001.

The staff attempted to burn at Kerns Winter Range on May 1, 2000, and again on May 5, 2000. Both attempts failed, and the project has been abandoned. This project was partially completed (3 out of 4 burn units completed), and the fourth unit has been abandoned due to the high cost-to-benefit ratio. This project was cooperatively funded with the Rocky Mountain Elk Foundation, and the remaining money has been returned to that organization for re-allocation to other projects.

Evergreen trees were transplanted to Tie Flume Campground in October of 1999 (FY 2000). The work was accomplished using funds (KV) that were collected primarily from the sale of forest products, such as Christmas trees and transplants. A total of 55 seedlings were transplanted, and this project is planned to continue for many years until visual screening has been restored and wildlife habitat opportunity has been maximized. Monitoring of the previous three years work indicated over 99% survival rate, and this project is expected to be a success story – finally!

Snags were marked with signs to protect them for cavity-dependant wildlife species within the Caribou Timber Sale during FY 2000. This work was funded with receipts collected from the timber sale contractor (KV). Only 2 cutting units were ready to be released (commercial harvest contract is still ongoing), which amounted to about 325 acres accomplished. This project is scheduled for completion during the FY 2001 field season.

Two other KV projects were not accomplished during FY 2000 due to personnel being pulled to fight wildfires. A target of 15 acres of aspen retention and a target of 20 acres of meadow encroachment work were not accomplished. The aspen retention project consisted of cutting small conifers in the understory of mature aspen stands to defer natural succession. The meadow encroachment project was similar in that small conifers were to be removed from the edges of parks to prevent the eventual transition of openings to forests. Both projects and targets have been rolled over to FY 2001 and will be added to the program of work (meaning twice as much work to do next year).

Aspen: Stands were monitored to determine response following prescribed burning. Stands were also examined to measure regeneration, to determine if regeneration was receiving excessive browsing by ungulates. Improvements were made on one aspen exclosure to eliminate spots that calves were using to get inside the exclosure. Exclosures around aspen stands at Shell Creek, Shell Canyon and Woodchuck Bench were inspected, vegetation condition was documented, and maintenance was performed where necessary.

Toe of Cement Aspen Exclosure: An exclosure was constructed in August 2000 to protect an aspen stand from overbrowsing (from elk and livestock) so it has a chance to regenerate. The exclosure is a 7-strand electric wire fence powered by a solar panel (approximately 1 acre in size).

Monitoring of Prescribed Burns: A photo point was established within the Cookstove Basin prescribed burn. Photos were taken to monitor the post-burn vegetation response/conditions. A field inspection (no photos were taken) was conducted at Runway Ramp prescribed burn to monitor post-burn vegetation conditions/response.

West Cement Mountain Prescribed Burn (Paintrock Basin): A prescribed burn was conducted to burn a mosaic in sagebrush, regenerate some aspen clones, and eliminate some conifer encroachment on the west side of Cement Mountain. Goals were to increase wildlife and livestock forage, and diversify the vegetative composition, age classes and structure throughout sagebrush stands.

Willow/riparian exclosures: Monitoring of willow/riparian vegetation within 12 exclosures (approximately 455 acres) was conducted during the 2000 field season. Also, inspection and maintenance was performed on the 12 exclosures where necessary.

Upland habitat exclosures: Inspection and maintenance of 3 upland exclosures (approximately 5 acres upland habitat) was conducted during the 2000 field season. Vegetative condition and composition within exclosures was also documented.

MONITORING REQUIREMENT: Winter Range Carrying Capacity

The Wyoming Game and Fish Department conducted classification surveys and population trend counts on winter range. Data (from 1999 herd unit reports) indicates a slight population increase in mule deer over the last four years. Elk numbers exceed the objective for herd units on the west side.

MONITORING REQUIREMENT: Riparian Ecosystem Trends

The enclosure fences on Lick Creek were modified to eliminate gaps at stream crossings in FY 1998. One of the newly constructed sites had to be modified further in FY 2000, to exclude cattle from a side gully and to reduce long-term fence maintenance due to snow damage. The Lick Creek area had fisheries structures installed several years ago, and then was fenced to exclude livestock. The fence was originally built as three separate enclosures with gaps between to facilitate cattle movement across the valley. Cattle movements through the gaps were creating problems with bank stability and water quality. The grazing permittees have since indicated that the entire area could be fenced as one continuous enclosure and cattle movements would not be adversely affected. Removing the gaps benefited about 30 acres of wetland/riparian habitat and 1 mile of fisheries stream habitat. The reconstruction project also reduced long-term maintenance costs.

Another goal this year was to transplant willows and reset cages within the enclosure. This work was not done this year due to budget and time constraints.

All of the riparian enclosures on the east side of the Bighorns were maintained this season. These enclosures protect 1,003.5 acres of riparian habitat and a total of six miles of fisheries streams. The effected streams are:

- ✓ Lick Creek - 3 enclosures, 30 acres, and 1 mile of stream.
- ✓ Fool Creek - 2 enclosures, 30 acres, 2 miles of stream.
- ✓ Sucker Creek - 1 enclosure, 20 acres, 0.5 mile of stream.
- ✓ Ranger Creek - 1 enclosure, 50 acres, 0.5 mile of stream
- ✓ East Fork - 1 enclosure, 600 acres, 1 mile of stream
- ✓ Preacher Rock - 1 enclosure, 250 acres, 0.7 mile of stream
- ✓ Bull Creek - 1 enclosure, 3 acres, 0.2 mile of stream.
- ✓ Little Willow - 1 enclosure, 15 acres, and 0.1 mile of stream.
- ✓ Hunter Creek Pasture - 1 enclosure, 1/4 acre.
- ✓ South Hospital Hill - 1 enclosure, 1/4 acre.
- ✓ Hunter Mesa Riparian - 1 enclosure, 1/4 acre.
- ✓ Hunter Mesa Cow - 1 enclosure, 1/2 acre.
- ✓ Hunter Mesa Wildlife - 1 enclosure, 1/2 acre.
- ✓ New Hondo Creek - 1 enclosure, 1/4 acre.
- ✓ Grommund Creek - 1 enclosure, 3/4 acre, 300' of stream.
- ✓ Dry Poison Creek - 1 enclosure, 2.5 acres, 1000' of stream.
- ✓ #3 East - 1 riparian enclosure, 16' x 16'.
- ✓ #4 Hansen's Spring - 1 riparian enclosure, 16' x 16'.
- ✓ #1 Hansen Sawmill - 1 riparian enclosure, 16' x 16'.

Some of the above enclosures 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 enclosures to deteriorate, and then investing more work to bring them up to standard. Also, it has been shown that even one year's worth of browsing inside an enclosure can set the vegetation back far enough that it takes several years of protection to recover.

Willows were not transplanted into empty cages inside the Fool Creek exclosure again during FY 2000.

There is a need to maintain/supplement the willow plantings on Bull Creek at the upper exclosure. More cages could be added if funding allows, but this project was not funded for FY 2000.

The Lick Creek exclosure fences were changed to eliminate gaps at stream crossings. The area had fisheries structures installed several years ago and then was fenced to exclude livestock. The fence was originally built as three separate exclosures with gaps between to facilitate cattle movement across the valley. Cattle movements through the gaps were creating problems with bank stability and water quality. Removing the gaps benefited about 30 acres of wetland/riparian area and 1 mile of fisheries habitat.

Willows were planted in Shutts Flat (South Tongue watershed) in 1998. No monitoring was conducted in FY 2000 due to loss of labor force to fight wildfires in Wyoming.

The lower riparian exclosure on Fool Creek was rebuilt in 1999. Trout Unlimited is currently rebuilding the upper exclosure. No willows were transplanted into empty cages inside the Fool Creek exclosure in FY 2000, and the upper exclosure was not completed. Both projects (planting willows and rebuilding the exclosure) are scheduled for FY 2001.

Routine monitoring and maintenance of fish structures was not done during FY 2000. Specifically, the in-stream structures in Fool Creek, Bull Creek, Lake Creek and in Lick Creek (about 300 structures total) were not checked or maintained due to personnel being pulled to fight fire.

Ongoing intensive monitoring of willow utilization by wildlife and domestic livestock was conducted on various allotments. Stubble height was also measured in conjunction with willow transects. This data can be found in the Range narrative section of this document.

RARE PLANTS Program Summary

A two-person crew inventoried approximately 15,000 acres. 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.

Penstemon caryi and *Arnica lonchophylla* were the two sensitive species prioritized for search. A large percentage of the inventory time was spent unsuccessfully looking for these plants, so we learned about their “rarity”, especially when compared to *A. lackshewitzii* and *A. mollis*, which are relatively common. All of the *P. caryi* sites discovered or visited in the past several years occur on sites that are actively eroding or slumping and occur on a few sedimentary soil map units.

Rubus acaulis population trend monitoring was implemented for the first time this year. This protocol was developed by WYNDD botanist Walt Fertig in 1999. The objective of this monitoring is 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 this summer, it is very likely that this is the only occurrence of this species on the Bighorn.

Cymopterus williamsii, a Bighorn endemic, and *Physaria lanata*, WYNDD Species of Concern, were searched for this summer. Putting these plants on our “radar screen” will give us data to help determine the conservation status of these plants, and will help determine if any projects we have could be negatively affecting these plants.

Sensitive Species	New Occurrences in FY 2000	Expanded Occurrences in 2000	Previously Known Occurrences
<i>Agoseris lackshewitzii</i>	5	0	26
<i>Aster mollis</i>	0	0	33
<i>Arnica lonchophylla</i>	0	0	8
<i>Festuca hallii</i>	0	0	1(?)
<i>Penstemon caryi</i>	2	1	10
<i>Rubus acaulis</i>	0	0	1
<i>Sullivantia hapemanii</i>	0	0	14

RANGE Program Summary

This was another busy year for rangeland management personnel on the Forest. The deferred maintenance inventories were completed and folders prepared for all range improvements on the Forest. Once the Infra database is up and running, the data will be entered and the electronic file brought up to date. The amount of annual work will then be reduced to updating the database for new or reconstructed improvements.

The Medicine Wheel/Paintrock District implemented 5 Allotment Management Plans covered by the 58,000-acre Shell Basin Analysis.

The Tongue District continued the NEPA analysis on the 172,119 acre Tongue Drainage. The projected completion date for this analysis and Decision Notice will be 2002, if the cultural resource inventory work is completed.

The following data summarizes the monitoring results for the 2000 grazing season and includes reports submitted by individual Districts for their programs:

Riparian Vegetation Monitoring Results

I. Number of Allotments:	MW/PN ¹⁰	PRRD ¹⁰	TNG ^{1,10}	Forest
Total Number of Active Allotments	35	27	23	85
Allotments Monitored by Permittees	6	13	13	32
Allotments unknown--have not received data yet	25		15	40
Allotments Monitored by Forest Service	24	2	15	41
Allotments in nonuse	3			3
% of Allotments Monitored by Permittees	17%	48%	57%	38%
% of Allotments Monitored by U.S.F.S	69%	7%	65%	48%
Total Percent of Allotments Monitored² Does not mean 100% of Allotment Acreage	86%	55%	100%	86%

¹ Does not include the Piney, Little Piney or Willow Park Allotments. These allotments are administered through the Powder River Ranger District and are included in the Powder River RD figures.

² Not all monitoring information has been turned in to date by permittees, so there will be additional numbers of photopoints and transects read for the 2000 monitoring that are not reflected above.

¹⁰ MW/PN = Medicine Wheel/Paintrock District; PRRD = Powder River Ranger District; TNG = Tongue District

	MW/PN	PRRD	TNG	Forest
Allotments Exceeding Standards to the Point of Discussing/Implementing Resource Recovery Period	1	1	14	16
II. Number of Permittees				
Total Number of ACTIVE Permittees	35	33	33	101
Number of Permittees Providing Transect Data	8	17	15	40
Permittees with data, but not turned in yet	5			5
Permittees not known if collected data	9	12	18	39
% of Permittees Providing Transects	37%	52%	45%	45%
Permittees in nonuse	3	0	0	3
III. Number of Forage Utilization Transects³⁴				
Transects Read by Permittees	40	64	35	139
Number that met Standards	36	64	34	134
% that met Standards	90%	100%	97%	96%
Transects Read/Spotchecked by USFS	12	11	72	95
Number that met Standards	9	2	25	36
% that met Standards	75%	18%	35%	38%
Transects Read by FS/Permittee Together	0	0	5	5
Number that met standards	0	0	4	4
Total % of Transects Meeting Standards	0	0%	80%	80%
Total Number of Transects Read	52	75	112	239
Total No. of Transects Meeting Standards	45	66	63	174
Total % of Transects Meeting Standards	87%	88%	56%	73%
IV. Number of Willow Utilization Transects	5			
Transects Read by Permittees	1	0	8	9
Transects Read/Spotchecked by USFS	9	0	17	26
Total Number of Transects Read	10 ⁶	0	25	35

³ Not all monitoring information has been turned in to date by permittees, so there will be additional numbers of photopoints and transects read for the 2000 monitoring that are not reflected above.

⁴ See Above

⁵ On going intensive monitoring of willow utilization by wildlife and domestic livestock was conducted on various allotments. No more than 30% of leaders are to be browsed by both wildlife and livestock in order to meet utilization standards. Stubble height was also measured in order to meet utilization standards. This data can be found in the range portion of this document.

⁶ Seven of the willow transects were read to obtain percent of twigs removed. Five of those transects are on an allotment where utilization of 30% is standard. Two of those transects did not meet standards. These transects were established to determine the amount of use and by which browser. The remaining 14 transects measure height and were established to detect a positive or negative change in height. Only two of these transects was measured this year.

	MW/P	PRRD	TNG	Forest
V. Number of Aspen Utilization Transects	7			
Transects Read by Permittees	0	0	0	0
Number that met Standards	0			0
Transects Read/Spotchecked by USFS	4	0	0	4
Number that met Standards	0	0	0	0
Total Number of Transects Read	4	0	0	4
Total No. of 'Transects Meeting Standards	0	0	0	0
VI. Number of Bank Stability Readings				
Reading Taken by Permittees	0	3	0	3
Number that met Standards		3		3
Readings Taken by Forest Service	0	0	0	0
Number that met Standards	0	0	0	0
Total Number of Readings Taken	0	3	0	3
Total No. of Readings Meeting Standards		3		3
VII. Photopoints				
Recorded by Permittees	40	61	15	116
Recorded by Forest Service ⁸	12	0	20	32
Recorded by Permittee/FS together	1	0	0	1
Total Photopoints Recorded	53	61	35	149

Management Attainment Summary

Description	Target	Accomplishment
Allotments Analyzed	17 Allotments	0 Allotments
Grazing Allot. Admin. to Std.	26 Allotments	26 Allotments
Grazing Allot. Admin. Total	84 Allotments	84 Allotments
Cattle & Horses (Billed) ⁹	96,900 H.M.'s	93,458 H.M.'s
Sheep & Goats (Billed)	37,000 H.M.'s	47,503 H.M.'s
Rangeland Monitored & Evaluated	50,000 Acres	50,000 Acres
Range Improvements-Nonstructural	200 Acres	250 Acres
Range Improvements-Structural	3 Structures	5 Structures

⁷ Eleven aspen transects are established to monitor annual utilization and long term trend. Eight of these transects are located on an allotment which has an aspen utilization standard of 10% on terminal buds. The remaining transects were established to monitor change in height and number of sprouts. One of these transects was read this grazing season.

⁸ Majority of the photopoints are tied to aspen, willow and streambank transects.

⁹ Based on 1998 data, the 1999 data has not been compiled due to computer program changes.

Noxious Weed Treatment

In 2000, the Forest utilized Management Agreements with Bighorn, Johnson, Sheridan and Washakie County Weed & Pest Districts to control noxious weeds on the Forest. The four Weed & Pest Districts covered 8,755 gross acres to treat 554 net acres of noxious weeds, maintain treatment records, and inventory all treated locations. Due to the success of this program, it will be continued for the foreseeable future.

DISTRICT SUMMARIES

MEDICINE WHEEL/PAINTROCK RANGER DISTRICT

The Medicine Wheel/Paintrock District initiated the NEPA analysis on the Devil’s Canyon Analysis area this year with projected completion of the Decision Notice during the winter months of 2002. The inventory to support the analysis covered 65,052 acres.

The Medicine Wheel/Paintrock District treated 270 acres of sagebrush with fire. The treatment was conducted on decadent sagebrush stands in order to reduce fuel loadings, improve wildlife habitat, and enhance species diversity.

MONITORING REQUIREMENT: Range Condition and Trend

No condition or trend data was collected during the 2000 field season. A cumulative effects study of browsing on willow by both wildlife and livestock was conducted by a graduate student from the University of Wyoming. The study began on the Paintrock District in 1995, and may have been completed in 1998. No reports on the study have been received since 1997.

MONITORING REQUIREMENT: Forage Utilization (Upland Range Sites)

- A) Utilization refers to the range of utilization levels that occurred within a given pasture in the upland sites. Blank fields indicate permittee has not submitted data, or utilization has not been analyzed.

Allotment	Pasture	Veg Type	Method Used	Utilization
Granite Creek	Middle	Feid-Artr	Ocular/Hght-Wt	
Granite Creek	Upper	Feid-Artr	Ocular/Hght-Wt	20-50+%
Granite Creek	Lower	Feid-Artr	Ocular	20-60+%
Granite Creek	Tomb	Feid-Artr	Ocular/Ht-Wt	20-60%
Salt Creek	East Willett	Feid-Dain	Ocular	
Salt Creek	Big Spring	Feid-Artr	Ocular	40-60%

Allotment	Pasture	Veg Type	Method Used	Utilization
Salt Creek	Ski Area	Slx-Deca	Ocular	40-50%
Salt Creek	Salt Creek	Feid-Artr	Ocular	40-50%
Salt Creek	Lower Cabin	Feid-Artr	Ocular	40-50%
Salt Creek	Upper Beef	Feid-Artr	Ocular	50-60%+
Salt Creek	Lower Beef	Feid-Artr	Ocular	40-60%
Shell Creek	Lower Shell	Feid-Artr	Ocular	40-50%
Shell Creek	Antelope Butte	Feid-Artr	Ocular	40-50%
Crooked Creeks	Crooked Creek	Feid-Artr	Ocular	35-40%
Traper Creek	Mill Creek	Feid-Artr	Ocular	60%+
Trapper Creek	Black Butte	Feid-Artr	Ocular	45-55%
Medicine Lodge	Lower	Feid-Dain	Ocular	30%
Medicine Lodge	North High	Feid-Carex		
Medicine Lodge	Lakes of the Rough	Des-Car	Ocular	0%
Forks	Lower Cold Spring	Feid-Artr	Ocular	45-55%
Forks	Upper Cold Spring	Feid-Artr	Ocular	60%+
Forks	Lower Cold Spring	Aspen	Ocular	40-60%+
Forks	Anthony Park	Feid-Dain	Ocular	40%
Paintrock Basin	North High	Feid-Dain	Ocular	30-40%
Paintrock Basin	Willow Swamp	Aspen-Poa	Ocular	60%+
Paintrock Basin	East Cement	Feid-Artr	Ocular	40-50%
Paintrock Basin	Toe Of Cement	Feid-Artr	Ocular	40%
Paintrock Basin	West Bench	Poa-Bro	Ocular	40-60%
Paintrock Basin	South High Park	Feid-Artr	Ocular	30-50%
Paintrock Basin	Lower Woodchuck	Poa-Artr	Ocular	30%
Paintrock Basin	Upper Woodchuck	Feid-Artr	Ocular	30-60%
Paintrock Basin	Battle Park	Feid-Dain	Ocular	40-45%
Paintrock Basin	Long Park Creek	Aspen-Poa	Ocular	40-50%
Shell Basin	Buckley Creek	Carex-Slx	Ocular	50-65%
Sunlight Mesa	Cottonwood	Artr-Feid	Ocular	
Sunlight Mesa	Torry Gulch	Feid-Dain-Artr	Height/Wt/Photo	
Sunlight Mesa	Torry Gulch	Feid-Dain-Artr	Height/Wt/Photo	
Sunlight Mesa	Deer Springs	Feid	Height/Weight	
Wiley Sundown	Wiley Sundown	Dain-Feid	Ocular	20-50%+
Wiley Sundown	Wiley Sundown	Dain-Feid		

Allotment	Pasture	Veg Type	Method Used	Utilization
Finger Creek	Finger Creek	Artr-Feid	Ocular	
Wallrock- Hidden Tepee	East Tepee	Feid-Dain	Ocular	
Wallrock- Hidden Tepee	West Tepee	Feid-Dain	Ocular	
Wallrock- Hidden Tepee	West Fork	Artr-Feid	Ocular	
Pole Creek	Ice Creek	Dain-Feid	Ocular	
Pole Creek	Middle	Dain-Feid	Ocular	
Pole Creek	Tongue	Dain-Feid	Ocular	
Pole Creek	Hunt Mt.	Dain-Feid	Ocular	
Little Horn S&G	East	Artr-Feid	Ocular	
Medicine Mt.	Lower Porcupine	Artr-Feid	Ocular	
Medicine Mt.	Upper Porcupine	Artr-Feid	Ocular	20-50%
Medicine Mt.	South Medicine	Artr-Feid	Ocular	20-60%
Medicine Mt.	Five Springs	Artr-Feid	Ocular	
Little Horn C&H	Trail	Artr-Feid	Ocular	
Little Horn C&H	Willow	Artr-Feid	Ocular	
Little Horn C&H	Wagon Box	Artr-Feid	Ocular	20-45%
Devil's Canyon	Cookstove	Artr-Feid	Ocular	
Devil's Canyon	Bucking Mule/TP	Artr-Feid	Ocular	20-40%
Devil's Canyon	Lodge Grass	Artr-Feid	Ocular	20-50+%
Devil's Canyon	Res. Hole	Artr-Feid	Ocular	20-35%
Whaley Creek	East Bald	Feid-Dain	Ocular	35-60%

B) Forage utilization (riparian and aspen range sites); residual stubble height in riparian and aspen stands. Browse transects in aspen and willow communities to monitor amount of current year's growth removed by wildlife and livestock and by wildlife alone.

Allotment	Pasture	WL/Cattle	Veg Type	Method Used	Standard	% Use or Residual Ht. Left
Granite	Middle	Cattle	Carex	Stubble Ht	7 ''	4-6''
Shell Cr	Antelope Basin	Cattle	Carex	Ocular	5 ''	6+''
Shell Cr	Upper Shell	Cattle	Carex	Ocular	5 ''	5+''
Shell Basin	Buckley Cr	Cattle	Carex	Ocular	7 ''	3 - 6+''
Shell Basin	Buckley Cr	Cattle/WL	Willow	Marked twig	30%	83%
Shell Basin	Buckley Cr	Wildlife	Willow	Marked twig	30%	82%
Crooked Cr	Johnny Cr	Cattle	Carex	Stubble Ht	7 ''	7+''
Crooked Cr	Jack Cr	Cattle	Carex	Stubble Ht	7 ''	7+''
Crooked Cr	Crooked Cr	Cattle	Carex	Stubble Ht	7 ''	
Salt Cr	Big Spring	Cattle	Carex	Stubble Ht	7''	6''
Paintrock	T of Cement #1	Cattle/WL	Aspen	Marked twig	10%	
Paintrock	T of Cement #1	Wildlife	Aspen	Marked twig	10%	
Paintrock	T of Cement #2	Cattle/WL	Aspen	Marked twig	10%	
Paintrock	T of Cement #2	Wildlife	Aspen	Marked twig	10%	
Paintrock	East Cement	Cattle/WL	Aspen	Marked twig	10%	
Paintrock	East Cement	Wildlife	Aspen	Marked twig	10%	
Paintrock	W Swamp #1	Cattle/WL	Willow	Marked twig	10%	
Paintrock	W Swamp #1	Wildlife	Willow	Marked twig	10%	
Paintrock	W Swamp #2	Cattle/WL	Willow	Marked twig	10%	
Paintrock	W Swamp #2	Wildlife	Willow	Marked twig	10%	
Paintrock	Sheep Cr #1	Wildlife	Willow	Marked twig	10%	

Allotment	Pasture	WL/Cattle	Veg Type	Method Used	Standard	% Use or Residual Ht. Left
Paintrock	Sheep Cr #1	Cat/WL	Willow	Marked twig	10%	
Paintrock	Sheep Cr #2 ¹⁰	Wildlife	Willow	Marked twig	10%	
Paintrock	Sheep Cr #2	Cattle/WL	Willow	Marked twig	10%	
Paintrock	Sheep Cr #3	Wildlife	Willow	Marked twig	10%	
Paintrock	Sheep Cr #3	Cattle/WL	Willow	Marked twig	10%	
Medicine L.	Medicine Lodge	Cattle/WL	Carex	Ocular	7 "	8+"
Medicine L.	Medicine Lodge	Cattle/WL	Willow	Height/Photo	Trend	Static
Trapper Cr	Mill Creek	Cattle	Carex	Ocular	7 "	5"
Forks	Medicine Lodge	Cattle	Aspen	Ocular	4 "	4+"
Forks	Meadow Cr	Cattle	Carex	Ocular	7"	
Forks	Anthony Park	Cattle	Carex	Ocular	5 "	8+"
Sunlight Mesa	Deer Springs	Cattle	Under Aspen	Stubble Ht	4"	
Med Mt	S Med T3	Cattle	Carex	Stubble Ht	7"	10.3"
Med Mt	Runaway T4	Cattle	Carex	Stubble Ht	7"	7.9"
Med Mt	Willow Crk	Cattle	Carex	Stubble Ht	7"	8.9"
Med Mt	Willow Crk	Cattle	Carex	Stubble Ht	7"	7.3"
Med Mt	Porcy trib-T7	Cattle	Carex	Stubble Ht	7"	8.9"
Med Mt	Porcy trib-T8	Cattle	Carex	Stubble Ht	7"	6.8"
Med Mt	Porcy tribT9	Cattle	Carex	Stubble Ht	7"	7"
Med Mt	Crystal Cr T6	Cattle	Carex	Ocular	7"	7+"
Whaley Cr	Whaley Cr	Sheep	Carex	Stubble Ht	5"	
Whaley Cr	East Bald	Sheep	Carex	Stubble Ht	7"	

¹⁰ Sheep Creek Transect #2 is inside an enclosure. Measurement was made for the period cattle were in the pasture. 1999 data has cattle use in the enclosure as cattle accessed the area prior to the enclosure being put up.

Allotment	Pasture	WL/Cattle	Veg Type	Method Used	Standard	% Use or Residual Ht. Left
Little HornS&G	East L Horn	Sheep	Carex	Stubble Height	6"	
Little Horn C&H	Willow	Cattle	Carex	Stubble Height	6"	
Little Horn C&H	Willow	Cattle	Carex	Stubble Height	6"	
Little Horn C&H	Willow	Cattle	Carex	Stubble Height	6"	
Little Horn C&H	Willow	Cattle	Carex	Stubble Height	6"	
Little Horn C&H	Willow	Cattle	Carex	Stubble Height	6"	
Little Horn C&H	Willow	Cattle	Carex	Stubble Height	6"	
Little Horn C&H	Wagon Box	Cattle	Carex	Stubble Height	6"	
Little Horn C&H	Wagon Box	Cattle	Carex	Stubble Height	6"	
Little Horn C&H	Wagon Box	Cattle	Carex	Stubble Height	6"	
Little Horn C&H	Wagon Box	Cattle	Carex	Stubble Height	6"	
Little Horn C&H	Trail-Kerns Flat	Cattle	Carex	Stubble Height	5"	
Little Horn C&H	Trail-Quaking Aspen Coulee	Cattle	Carex	Stubble Height	5"	
Little Horn C&H	Trail #4 Coulee	Cattle	Carex	Stubble Height	5"	10"
Little Horn C&H	Trail –Clay Bank	Cattle	Carex	Stubble Height	5"	
Little Horn C&H	Trail	Cattle	Carex	Stubble Height	7"	7.5 "
Little Horn C&H	Horse	Cattle	Carex	Stubble Height	7"	8.5"
Little Horn C&H	Horse	Cattle	Carex	Stubble Height	7"	10"
Little Horn C&H	West Burnt	Cattle	Carex	Stubble Height	7"	8.5"
Little Horn C&H	West Burnt	Cattle	Carex	Stubble Height	7"	10.5"

Allotment	Pasture	WL/Cattle	Veg Type	Method Used	Standard	% Use of Residual Ht. Left
Sage Basin	Below Camp	Cattle	Grass	StubbleHt UnderAspen	4"	
Devil's Canyon	Trout Creek T1	Cattle	Carex	Stubble Height	6"	10.8"
Devil's Canyon	Gumps T2	Cattle	Carex	Stubble Height	6"	7.5"
Devil's Canyon	Upper B Mule T1	Cattle	Carex	Stubble Height	4"	10.3"
Devil's Canyon	Lower B Mule T2	Cattle	Carex	Stubble Height	4"	7.7"
Devil's Canyon	North Fork B Mule T4	Cattle	Carex	Stubble Height	4"	10.3"
Devil's Canyon	North Fork B Mule T3	Cattle	Carex	Stubble Height	4"	8"
Devil's Canyon	Big TP Crk T5 below camp	Cattle	Carex	Stubble Height	4"	7"
Devil's Canyon	Big TP Crk Above camp	Cattle	Carex	Stubble Height	4"	8"
Devil's Canyon	Reservation Hole	Cattle	Carex	Stubble Height	6"	
Devil's Canyon	Lodge Grass (Gunstock)	Cattle	Carex	Stubble Height	6"	6.3"
Devil's Canyon	Lodge Grass (above Kerns)	Cattle	Carex	Stubble Height	6"	6.4"
Devil's Canyon	Lodge Grass (Crater Lake)	Cattle	Carex	Stubble Height	6"	7.9"
WY Gulch	L Horn Mead	Cattle	Carex	Stubble Ht	7"	10.5"
WY Gulch	½ Ounce	Cattle	Carex	Stubble Ht	7"	11"
WY Gulch	Gold Cr	Cattle	Carex	Stubble Ht	7"	11.5"
WY Gulch	Gold Cr	Cattle	Carex	Stubble Ht	7"	7.3"
WY Gulch	G&F cabin	Cattle	Carex	Stubble Ht	7"	12"
WY Gulch	Bald Mt Cr	Cattle	Carex	Stubble Ht	7"	12"
WY Gulch	T1 Meadows	Cattle	Carex	Stubble Height	7"	11"
WY Gulch	T2 Meadows	Cattle	Carex	Stubble Height	7"	11"
WY Gulch	WY Gulch Cr	Cattle	Carex	Stubble Height	7"	10"
WY Gulch	WY Gulch Cr	Cattle	Carex	Stubble Height	7"	9"

**MONITORING REQUIREMENT:
Carrying Capacity**

There are five active Coordinated Resource Management Plans (CRMP's) which are ongoing processes, and changes in management are made as needed.

POWDER RIVER RANGER DISTRICT

Range Improvements - Structural Improvements Planned

Allotment	Improvement Name (by priority)	Materials \$\$	Man Days	AMP Approved	MAR Target
North Canyon	Stock Tank Installation	1000.00	1	No	1 Done
Grommund Sourdough	20-Cow Park Fence Conversion to Let-down	500.00	1	No	1 Done
Muddy Creek	Crazy Woman Electric fence			Yes	1 Done
Tensleep Canyon	Electric Fence installation			No	Done
Dry Tensleep	Stock Tank Replacement			No	2 Done

2000 Crossing Permits Issued

Issued	Crossing	Permittee	Location	# & Kind	Overnight
05/19/00	05/20/00	Paradise Guest Ranch	Elgin/Schoolhouse	83 horses	No
06/14/00	06/19-20/00	Tony Rodriguez	Crazy Woman Stock Drive	600 sheep	Yes
06/29/00	07/01/00	Terrill Mills	FDR 24 to FDR 413 to private off-Forest	95 cattle	No
06/30/00	07/01/00	Bill Bolinger	Crazy Woman Stock Drive	48 cattle	No
08/17/00	08/21/00 & again 09/21/00	Doyle Ranches	Private & BLM across South Fork Paintrock Ridge to Shirran Private and return	96 cattle	No
09/18/00	10/14/00	Paradise Guest Ranch	Paradise to Schoolhouse Park to Elgin Park to off-Forest	65 horses	No
10/10/00	10/10 - 11/00	Camino & Son	Crazy Woman Stock Driveway	2800 sheep	Yes
10/23/00	10/23/00	Victor Goni	Crazy Woman Stock Drive	500 ewes 40 cows	No

2000 MONITORING

Date	Examiner	Pasture	Method/Location	Standard	Mearmnt
Battle Park		Submitted 01/03/01 Year 2000 Actual Use record submitted by Permittee: NO			
No dates	Perm **	Buck Cr	Stubble ht @ Crossing down east side in 3-10' of green line	4 or 5"	4.74" ***
No dates	Permittee	Buck Cr	Stubble ht @ Within 3' of creek back up to crossing	4 or 5"	5.73"***
No dates	Permittee	Soldier Cr	Stubble ht @ 3' from greenline upper end above & below rd	4 or 5"	5.45" ***
No dates	Permittee	Soldier Cr	Stubble ht @ cage going into trees out 3' from creek	4 or 5"	4.71" ***
No dates	Permittee	Bald Ridge?	Stubble ht @ head of Soldier Creek 3' north side of creek east of cage	4 or 5"	
No dates	Permittee	Bald Ridge	Stubble ht @ swamp at Lily Lake	4 or 5"	5.27" ***
No dates	Permittee	SF South	Stubble ht @ South Fork at old crossing	4 or 5"	5.17" ***
No dates	Permittee	SF South	Stubble ht @ Mud Mine	4 or 5"	5.18" ***
No dates	Permittee	Middle Fk	Stubble ht @ old crossing above & below road	4 or 5"	4.55" ***
10/15/00	G&F	Buck Cr	Photo (X4) of general view		
Sumr 00	G&F	Mid Fk	Photo (X6) of riparian areas		
10/19/00	G&F	Bald Ridge	Photo (X10) of general view		
10/15/00	public		General View photos		
08/04/00	FS	Sldr Cr Rp	Ocular		OK
08/04/00	FS	Buck Cr	Stubble ht above the ford	5"	4.76"
08/22/00	FS	Bald Ridge	Stubble ht above Bellyache flats	5"	2.72"
08/22/00	FS	Bald Ridge	Stubble ht Spring Branch	5"	3.20"
08/22/00	FS	Bald Ridge	Stubble ht Lake Helen Trail	5"	2.42"
08/22/00	FS	Bald Ridge	Stubble ht Lake Helen Trail just off the allotment, ungrazed		10.20"
08/22/00	FS	Bald Ridge	Stubble ht Upper-most reach of head of Soldier Ck	5"	5.16"
08/30/00	FS	Bald Ridge	Stubble ht riparian draw N. of Mid Fk Trail below Lily Lake	5"	3.32"
08/30/00	FS	Bald Ridge	Stubble ht adjacent to Lily Lake	5"	4.16"
08/31/00	FS	Middle Fk	Stubble ht near old trail	5"	3.78"
09/13/00	FS	Bald Ridge	Stubble ht below Warner Spring	5"	3.27"
09/27/00	FS	Buck Creek	Stubble ht in riparian area below proposed spring developmt	5"	3.90"
Clear Creek		submitted 01/02/01 Year 2000 Actual Use record submitted by Permittee: YES			
07/21/00	Permittee	Lw Buffalo	Stubble ht in key area	5"	5.05"
07/21/00	Permittee	S Hospital	Stubble ht in key area	5"	8.94"
07/23/00	Permittee	Holland	Stubble ht in key area	5"	7.90"
10/08/00	Permittee	Schlhse Pk	Stubble ht in key area with photo	5"	6.67"
10/08/00	Permittee	Schlhse Pk	Photopoint retaken		
10/08/00	Permittee	Buffalo Pk	Stubble ht in key area with photo	5"	5.14"
10/08/00	Permittee	Buffalo Pk	Photopoint retaken		
09/04/00	Permittee	Hunter Cr	Stubble ht in key area with photo	5"	11.61"

Date	Examiner	Pasture	Method/Location	Standard	Measrmt
09/04/00	Permittee	Hunter Cr	Photopoint retaken		
09/04/00	Permittee	Grouse Mt	Stubble ht in key area with photo	5"	5.37"
09/04/00	Permittee	Grouse Mt	Photopoint retaken		
09/04/06	Permittee	N Lucasta	Stubble ht in key area with photo	5"	7.14"
09/04/06	Permittee	N Lucasta	Photopoint retaken		
08/03/00	Permittee	Huntr Mesa	Stubble ht in key area with photo	5"	7.75"
08/03/00	Permittee	Huntr Mesa	Photopoint retaken		
08/03/00	Permittee	Hondo Cr	Stubble ht in key area with photo	5"	8.66"
08/03/00	Permittee	Hondo Cr	Photopoint retaken		
10/08/00	Permittee	S Lucasta	Stubble ht in key area with photo	5"	7.96"
10/08/00	Permittee	S Lucasta	Photopoint retaken		
10/08/00	Permittee	N Hospital	Stubble ht in key area with photo	5"	7.14"
10/08/00	Permittee	N Hospital	Photopoint retaken		
10/08/00	Permittee	Circle Pk	Stubble ht in key area with photo	5"	5.98"
10/08/00	Permittee	Circle Pk	Photopoint retaken		
Crazy Woman S&G		Managed with Muddy C&H; No data submitted to date			
Doyle Creek		submitted 11/24/00 Year 2000 Actual Use record submitted by Permittee: YES			
09/12/00	Permittee	E Doyle	Stubble Ht @ H-3 Doyle Campground with photos	4"	5.70"
09/12/00	Permittee	E Doyle	Stubble Ht @ H-1 Taylor Creek with photos	4"	8.30"
09/12/00	Permittee	E Doyle	Stubble Ht @ H-2 Long Meadow with photos	4"	11.02"
08/04/00	Permittee	W Doyle	Stubble Ht @ H-1 Long Meadow with photos	4"	6.50"
Dry Tensleep		submitted 12/11/00 Year 2000 Actual Use record submitted by Permittee: YES			
		No data submitted by permittee			
Garnet S&G		No data submitted to date			
Grommund (with Sourdough)		submitted 10/15/01		Year 2000 Actual Use record submitted by Permittee: YES	
08/07/00	Permittee	Southeast	Stubble ht @ Kay area; with photos	5"	6.34"
08/07/00	Permittee	Southeast	Streambank photos		
08/07/00	Permittee	Southeast	Panorama photo		
08/07/00	Permittee	Lwr Grmnd	Stubble ht @ Key area; with photos	5"	7.44"
08/07/00	Permittee	Lwr Grmnd	Streambank photos		
08/07/00	Permittee	Lwr Grmnd	Panorama		
08/29/00	Permittee	W O Camp	Stubble ht @ Key area ; with photos	5"	5.69"
08/29/00	Permittee	W O Camp	Panorama		
09/30/00	Permittee	Sourdgh W	Stubble ht @ Hanson's Sawmill Key area; with photos	5"	5.75"
09/30/00	Permittee	Hansons S	Photopoint		
09/30/00	Permittee	Hansons S	Streambank		
09/30/00	Permittee	Sourdgh W	Stubble ht @ Lynx Park; with photos	5"	6.85"
09/30/00	Permittee	Lynx Park	Stubble Ht		
09/30/00	Permittee	Lynx Park	Panorama		

Date	Examiner	Pasture	Method/Location	Standard	Mearmt
09/30/00	Permittee	Sourdgh E	Stubble ht @ Key area; with photos	5"	9.81"
Hazelton S&G		No data submitted to date			
Leigh Creek S&G		Managed with Upper Meadows S&G			
McLain Lake S&G		No authorized use on this allotment			
Misty Moon S&G		Managed with Battle Park C&H			
Monument		submitted 12/28/00 Year 2000 Actual Use record submitted by Permittee: YES			
No dates	Permittee	Trap	General View Photos		
No data submitted to date					
North Canyon		submitted 11/24/00 Year 2000 Actual Use record submitted by Permittee: YES			
08/01/00	Permittee	West Vee	Stubble ht below fence out from water	4 or 5"	7.12"
	Permittee	West Vee	Below Fence near water		7.74"
09/06/00	Permittee	High Park	Indian Creek near water	5"	7.06"
	Permittee	High Park	Out from water	5"	6.68"
09/06/00	Permittee	Stove Cr	Near water	5"	7.16"
	Permittee	Stove Cr	Out from water	5"	6.94"
10/09/00	Permittee	East Vee	Below trails to Squaw Cr our form water	5"	7.08"
	Permittee	East Vee	Near water	5"	7.90"
10/10/00	Permittee	East Vee	Teepee Cr East Vee by old cabin near water	5"	7.44"
	Permittee	East Vee	Out from water	5"	7.08"
10/09/00	Permittee	East Vee	Below trails to Squaw Cr out from water	5"	7.06"
	Permittee	East Vee	Near water	5"	7.50"
10/09/00	Permittee	Canyon	Indian Cr by Varney's near water	5"	7.20"
	Permittee	Canyon	Out from water	5"	6.70"
Piney Cr		submitted 11/24/00 Year 2000 Actual Use record submitted by Permittee: YES			
09/07/00	Permittee		Stubble Ht @ Ranger Station swamp H-1 with photo	4"	13.60"
09/07/00	Permittee		Stubble Ht @ South Swamp H-1 with photo	4"	11.30"
09/07/00	Permittee		Stubble Ht @ Big Swamp Baird Spg H-2 with photo	4"	12.40"
09/07/00	Permittee		Stubble ht @ Big Swamp Baird Spg H-1with photo	4"	14.90"
Poison Cr		submitted 11/24/00 Year 2000 Actual Use record submitted by Permittee: YES			
07/26/00	Permittee	Billy Cr	Stubble Ht @ H-1 with photo	4"	No sum
07/26/00	Permittee	Billy Cr	Stubble Ht @ H-2 with photo	4"	No sum
08/14/00	Permittee	Hazelton	Stubble Ht with photo	4"	6.84"
08/14/00	Permittee	Poison Cr	Stubble ht with photo	4"	6.60"

Date	Examiner	Pasture	Method/Location	Standard	Mearmt
Powder River C&H		No authorized use in year 2000			
Rock Ck		submitted 11/27/00 Year 2000 Actual Use record submitted by Permittee: YES			
08/17/00	Permittee	S French	Stubble ht @ North of Cabin with photo	4 or 5"	8.04"
08/17/00	Permittee	S French	Stubble ht Cull Watt Park with photo	4"	5.62"
08/17/00	Permittee	Rock Cr	Stubble ht Sayles Cr with photo	4"	6.82"
08/17/00	Permittee	Rock Cr	Stubble ht at Ginger's Cabin with photo	4"	5.16"
No date	Permittee	Johnson Cr	Stubble ht @ Pack Trail By Meadow	4"	8.34"
No date	Permittee	Johnson Cr	Stubble ht North of Paradise Horse Pasture	4"	4.91"
No date	Permittee	Johnson Cr	Stubble ht Keno Creek	4"	6.70"
S Canyon C&H		No data submitted to date			
Tensleep Canyon		No data submitted to date			
Upper Meadows		submitted 11/29/00 Year 2000 Actual Use record submitted by Permittee: YES			
08/20/00	Permittee	N Mdows	Permittee Photopoint #31		
08/20/00	Permittee	N Mdows	Permittee Photopoint #32		
08/20/00	Permittee	N Mdows	Permittee Photopoint #33		
08/20/00	Permittee	N Mdows	Permittee Photopoint #34		
08/20/00	Permittee	N Mdows	Permittee Photopoint #27		
08/20/00	Permittee	N Mdows	Permittee Photopoint #28		
08/20/00	Permittee	N Mdows	Permittee Photopoint #29		
08/20/00	Permittee	N Mdows	Permittee Photopoint #30		
08/27/00	Permittee	S Mdows	Permittee Photopoint #1		
08/27/00	Permittee	S Mdows	Permittee Photopoint #2		
08/27/00	Permittee	S Mdows	Permittee Photopoint #4		
08/27/00	Permittee	S Mdows	Permittee Photopoint #5		
08/27/00	Permittee	S Mdows	Permittee Photopoint #6		
08/27/00	Permittee	S Mdows	Permittee Photopoint #9		
08/27/00	Permittee	S Mdows	Permittee Photopoint #10		
08/27/00	Permittee	S Mdows	Permittee Photopoint #11		
08/27/00	Permittee	Bby Wagn	Permittee Photopoint #13		
08/27/00	Permittee	Bby Wagn	Permittee Photopoint #14		
08/27/00	Permittee	Bby Wagn	Permittee Photopoint #15		
08/27/00	Permittee	Bby Wagn	Permittee Photopoint #17		
08/27/00	Permittee	Bby Wagn	Permittee Photopoint #18		
08/27/00	Permittee	S Mdows	Permittee Photopoint #19		
08/27/00	Permittee	S Mdows	Permittee Photopoint #20		
08/20/00	Permittee	N Mdows	Permittee Photopoint #26		
08/20/00	Permittee	N Mdows	Permittee Photopoint #35		
08/20/00	Permittee	N Mdows	Permittee Photopoint #36		
08/20/00	Permittee	N Mdows	Permittee Photopoint #37		
08/20/00	Permittee	N Mdows	Permittee Photopoint #38		
08/20/00	Permittee	Burn	Permittee Photopoint #40		
08/20/00	Permittee	Burn	Permittee Photopoint #41		
08/20/00	Permittee	Burn	Permittee Photopoint #42		

Date	Examiner	Pasture	Method/Location	Standard	Mearmt
08/20/00	Permittee	Burn	Permittee Photopoint #43		
08/20/00	Permittee	Burn	Permittee Photopoint #44		
08/20/00	Permittee	Burn	Permittee Photopoint #45		
08/20/00	Permittee	Burn	Permittee Photopoint #46		
08/20/00	Permittee	Burn	Permittee Photopoint #47		
08/20/00	Permittee	Burn	Permittee Photopoint #48		
08/20/00	Permittee	Burn	Permittee Photopoint #49		
07/20/00	Permittee	Leigh Cr	Permittee Photopoint #1		
07/20/00	Permittee	Leigh Cr	Permittee Photopoint #2		
07/20/00	Permittee	Leigh Cr	Permittee Photopoint #3		
07/20/00	Permittee	Leigh Cr	Permittee Photopoint #4		
07/20/00	Permittee	Leigh Cr	Permittee Photopoint #5		
07/20/00	Permittee	Leigh Cr	Permittee Photopoint #6		
07/20/00	Permittee	Leigh Cr	Permittee Photopoint #7		
07/20/00	Permittee	Leigh Cr	Permittee Photopoint #8		
Willow S&G		Managed with Upper Meadows in Year 2000			
Willow ParkC&H		submitted 01/16/01 Year 2000 Actual Use record submitted by Permittee: YES			
09/17/00	Permittee		Elk Creek Key Area; with photos	5"	6.34"
09/17/00	Permittee		Penrose Creek Key Area; with photos	5"	6.10"
09/17/00	Permittee		Willow Park Key Area; with photos	5"	10.46"

** No name or signature of permittee provided

*** No indication of average or longest leaf length provided

TONGUE RANGER DISTRICT

Willow Transects

The following table displays results of browse transects in willow communities to monitor the amount of the current year's growth of marked willows by wildlife and livestock. Transects identified as wildlife/cattle show the percentage of marked twigs browsed during the time period livestock were in the pasture. Transects identified as wildlife show the percentage of marked twigs browsed during the time period or partial time period when livestock were not in the pasture.

Allotment	Pasture or Area	Wildlife/Cattle	Method	Period Monitored	Percent Use
Copper Creek	Copper Creek	Wildlife	Marked Twigs	9/16/99 - 7/14/00	66%
	Copper Creek	Wildlife	Marked Twigs	7/14/00 - 8/2/00	36%
	Copper Creek	WL/Cattle	Marked Twigs	8/2/00 - 9/13/00	28%

Allotment	Pasture or Area	Wildlife/Cattle	Method	Period Monitored	Percent Use
Copper Creek	South Tongue	Wildlife	Marked Twigs	9/16/99-7/14/00	80%
	South Tongue	Wildlife	Marked Twigs	7/14/00 - 8/2/00	31%
	South Tongue	WL/Cattle	Marked Twigs	8/2/00 - 9/13/00	37%
Lower Tongue	Little Willow	WL/Cattle	Marked Twigs	6/30/00 – 8/10/00	91%
Lower Tongue	Sheeley Creek	Wildlife	Marked Twigs	8/13/99 – 6/30/00	41%
	Sheeley Creek	Wildlife	Marked Twigs	6/30/00 – 8/10/00	24%
	Sheeley Creek	WL/Cattle	Marked Twigs	8/10/00 – 9/5/00	43%
Lower Tongue	East Experimental	Wildlife	Marked Twigs	8/2/99 – 6/29/00	20%
Lower Tongue	East Experimental	WL/Cattle	Marked Twigs	6/29/00 – 7/11/00	96%
	East Experimental	WL/Cattle	Marked Twigs	6/29/00 – 7/10/00	39%
Lower Tongue	West Experimental	Wildlife	Marked Twigs	7/27/99 – 6/29/00	15%
	West Experimental	Wildlife	Marked Twigs	6/29/00 – 7/7/00	2%
	West Experimental	WL/Cattle	Marked Twigs	7/7/00 – 7/18/00	44%
	West Experimental	WL/Cattle	Marked Twigs	7/7/00 – 7/18/00	88%

Upland Utilization

Allotment	Location/Pasture	Monitored By	Veg Type	Method	Utilization
Amsden	Arneys Cross	Permittee	All Grasses	Stubble Ht (SH)	9.5-9.6”
	Face	Permittee	All Grasses	SH	10.2-11.0”
	Cabin	Permittee	All Grasses	SH	6.8-8.6”
Copper Crk/Up Dry Fk	Upper Dry Fork	FS	Artr/Feid	Ocular	40-60+%

Allotment	Location/Pasture	Monitored By	Veg Type	Method	Utilization
Fishhook/Fool Creek	Fool Creek	FS	Uplands near riparian	Ocular	60+%
Freezeout East	South	FS	Timothy	Ocular	20-25%
			Other Grasses	Ocular	50-60%
Freezeout West	Schuler Park	FS	Uplands near riparian	Ocular	40-60%
	Schuler Park (Dry Prong)	FS	Uplands near riparian	Ocular	60+%
	Hay Creek	FS	Uplands in Burn	Ocular	<25%
			Uplands near spring	Ocular	55-60+%
			Uplands near spring	Ocular	60%
Freezeout West	Hay Creek	FS	Uplands in burn	Ocular	30-50+%
			Uplands in burn	Ocular	30-50%
	Hay Creek (FC Basin)	FS	Poa Sites All other	Ocular	50-60% 40-60%
	Dry Fork	FS	Artr/Feid near Camp Crk	Ocular	20-45%
			Artr/Feid near spring	Ocular	40-60%
			Artr/Feid	Ocular	30-50%
			Artr/Feid	Ocular	30-50%
			Artr/Feid near FDR168	Ocular	50-60+%
Little Tongue	Horseshoe	FS	Uplands near riparian	Ocular	30-50%
Lower Tongue	Little Willow	FS	Poa Sites	Ocular	60+%
	Sheeley Creek	FS	Grasses in riparian	Ocular	30-50%
			Uplands near riparian	Ocular	50-60+%
	Bear Lodge (Big Willow)	FS	Uplands near riparian	Ocular	40-60%

Allotment	Location/Pasture	Monitored By	Veg Type	Method	Utilization
	Bear Lodge (L Willow)	FS	Uplands near riparian	Ocular	30-50%
	Bull Creek	FS	Uplands near riparian	Ocular	50-55%
Nicklemine	East Brush	FS	Uplands near riparian	Ocular	60+%
	River	FS	Grasses in riparian	Ocular	20-40%
			Uplands near riparain	Ocular	40-60%
	Highway	FS	Poa sites south of Hwy 14	Ocular	60+%
			Uplands south of Hwy 14	Ocular	40-60%
Pass Creek	Sawmill Flats	FS	Uplands near riparian	Ocular	40-60%
Prospect/Cedar	Cedar	FS	Uplands near headwaters	Ocular	50-60+%
		Perm	Uplands	SH	4.4-5.0”
Upper Tongue	River (south of 14A))	FS	Poa Sites	Ocular	50-60+%
		FS	Uplands near riparian	Ocular	50-55%
	River (north of 14A)	FS	Uplands near riparian	Ocular	40-60%
	Highway (Trail Cr)	FS	Uplands near riparian	Ocular	40-60%
	Highway (Tepee Cr)	FS	Uplands near riparian	Ocular	50-60%
	Highway (Spring Cr)	FS	Uplands near riparian	Ocular	40-60%
Wolf Creek	Star Fish (Sibley Cr)	FS	Uplands near riparian	Ocular	30-50%
		FS	Poa Sites	Ocular	50-60+%
	Big Bend (Bear Cr)	FS	Uplands near riparian	Ocular	30-50%
	The Jaws	FS	Uplands near riparian	Ocular	50-60%

FOREST VEGETATION AND TIMBER Program Summary

Forest vegetation, its condition, management, and the resultant timber commodity outputs are included in this monitoring and evaluation section.

The 2000 Forest outputs for forested vegetation and related activities are shown on the table of projected and actual outputs (Table 3). The outputs are those included in the Forest Plan monitoring section. The data in this report is from cut and sold, PTSAR, and STARS reports, and planned accomplished records in the Forest RMACT database. The Forest fifteen-year trends in timber management outputs are also shown in Table 3.

IMPLEMENTATION MONITORING

MONITORING REQUIREMENT:

Clear Cut Harvest Unit Size

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

MONITORING REQUIREMENT:

Assure Regeneration Within Allowable Time Frames of Final Harvest

In FY 2000, the Forest surveyed approximately 2,800 acres of commercial timber sales to determine the status of the regeneration on final harvest units, as defined in 36 CFR 219.27. The 2000 surveys will be reviewed and certifications made from them in 2001. 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 dry planting years have reduced some survival in the Boyd Ridge and Lick salvage areas.

Non-traditional vegetation management projects continue to be implemented without silvicultural prescriptions on the Forest, including highway right-of-way plantings, ski area expansion, prescribed burning, and habitat improvement projects. Current policy is to have a silvicultural prescription prepared for all vegetation manipulation projects. Without a prescription, assurance of regeneration is not documented.

Off-site trees transplanted in the bowl quarry of US Highway 14 construction have resulted in failure, with only a handful of the 3-4 foot transplants surviving. The area will be re-planted with native stock.

There is no evidence in the database of surveys to assure regeneration, or certification that past aspen regeneration treatments have met Forest Plan stocking requirements.

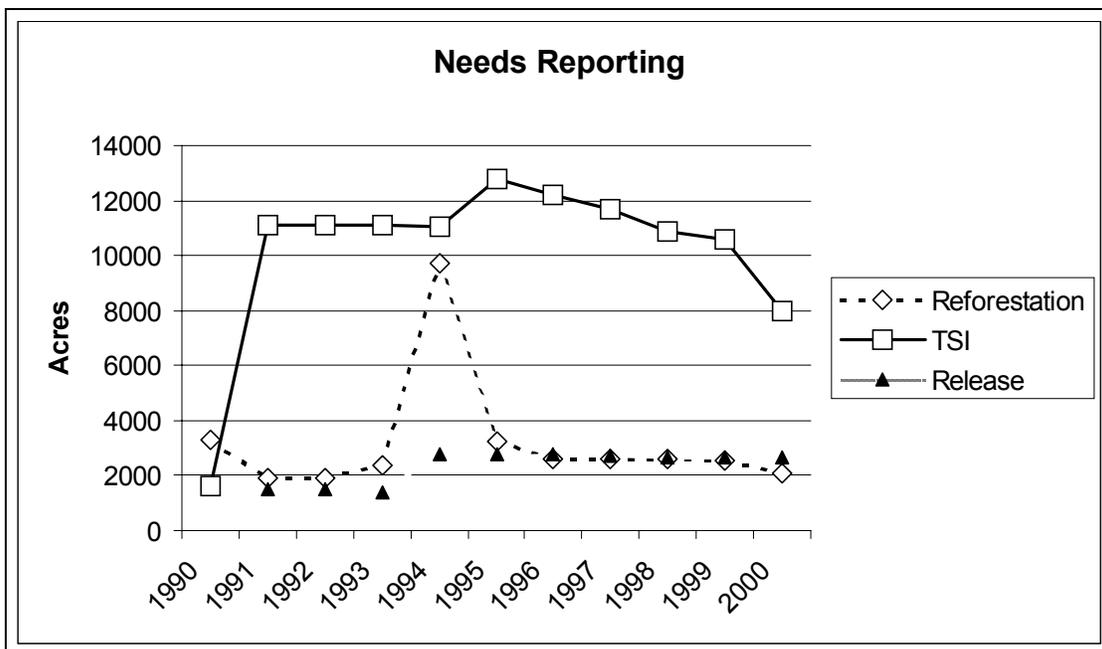
Qualitative surveys of recent wildfires have shown varied levels of regeneration. Without harvest, there is no legal timeframe to regenerate these wildfires, however, it is good management to monitor their progress. The Gold Mine Fire along the southern edge of the Forest, and portions of the Lost Fire have regenerated extremely well, to the point of overstocking. The more harsh sites on the Lost Fire, and West Pass Fire show very little regeneration. Continued monitoring of these and other recent fires should continue to determine status of regeneration.

**MONITORING REQUIREMENT:
Assure Reforestation and TSI Treatments are Current and No Backlog Created**

This year the activities in the RMRIS database were moved to the new RMACT program. The move has caused some discrepancy between previous years needs acres, particularly in TSI. The past monitoring reports recommended that the needs portion of the database for reforestation and TSI should be cleaned up and the differences shown this year are a result of that lack of maintenance. While the reforestation data reflects an accurate assessment of our needs, the needs section for TSI and release will have to be cleaned in order to use this system to accurately calculate the needs. The Forest should commit resources to maintaining the data, and cleaning up inaccuracies.

The reforestation needs report in RMACT shows, 2,087 acres needing reforestation (2,594 last year). The Forest should continue the commitment to the reforestation program to continue this trend.

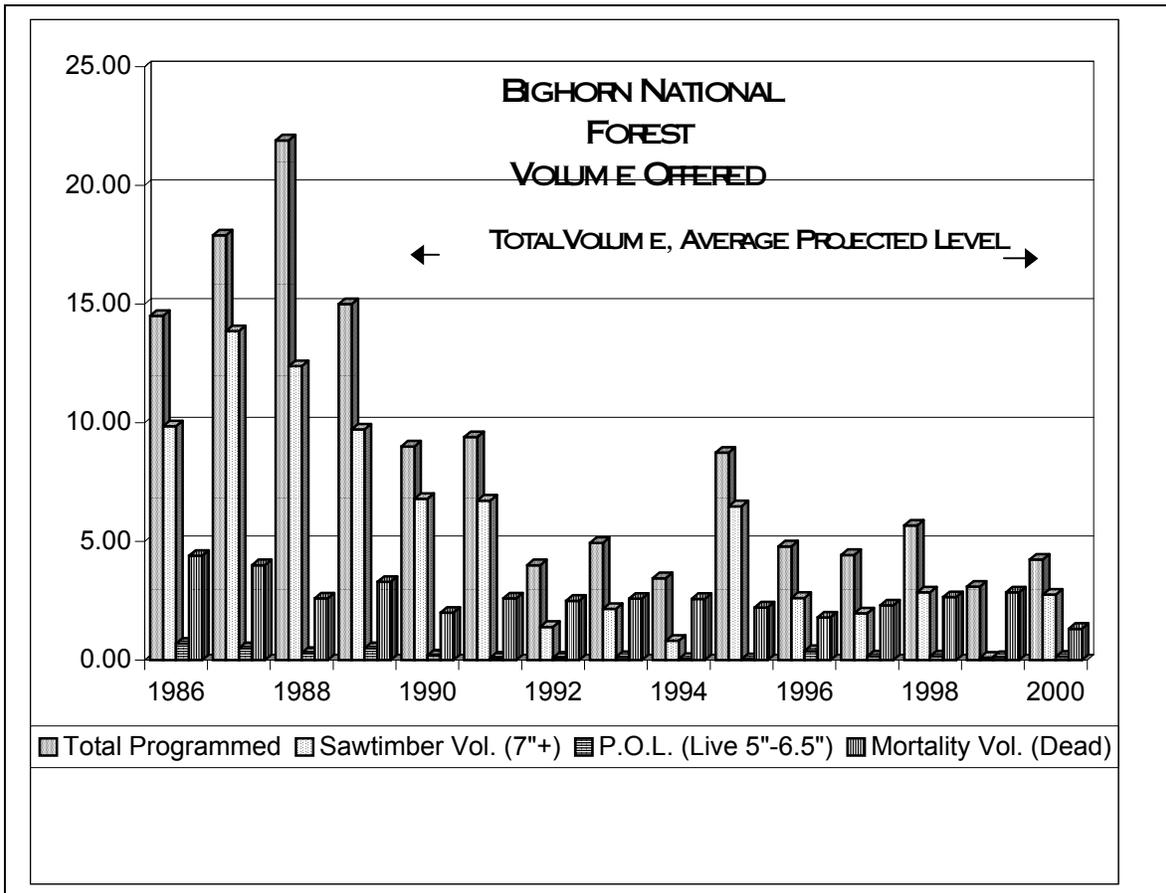
The RMACT database shows 7,309 acres needing Timber Stand Improvement (TSI), down from 7,987 in RMACT (RMRIS showed 10,761 acres last year), and no change in acres needing release (2,683 acres).



**MONITORING REQUIREMENT:
Compliance with Schedule and Outputs**

Current commercial timber offerings are below Forest Plan projections, except for mortality volume or fuelwood, as shown in Table 3. The acres offered for harvest by regeneration method are also below projected outputs. Funding, administrative limits, and differences between outputs and Standards and Guidelines have contributed to lower outputs than what was projected in 1985.

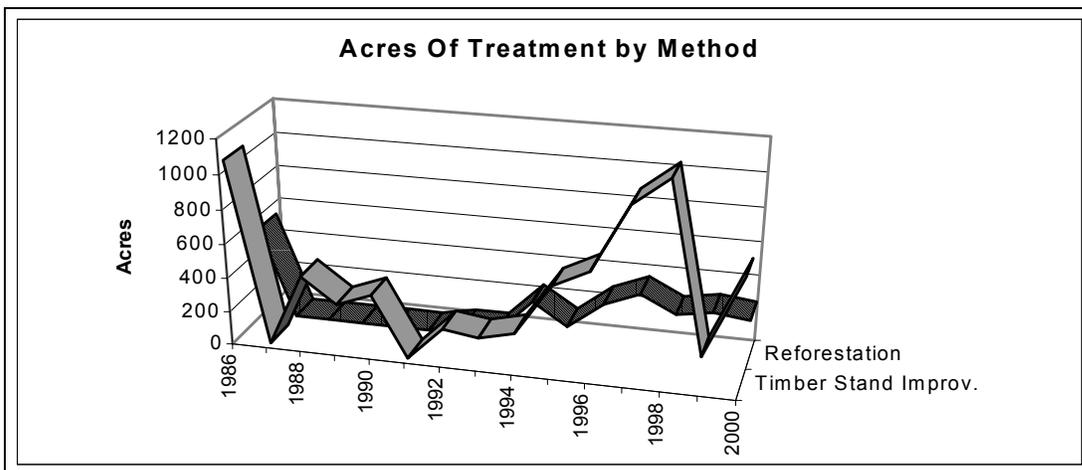
Through the end of FY 2000, after fifteen years of implementation, the Forest has offered 32.7 million cubic feet, MMCF (131.0 million board feet, MMBF), compared to a projected output of 63.0 MMCF (245.0 MMBF), or 52 percent of the projected ASQ output (54% last year). The Forest has not identified a future timber sale program at the current Forest Plan sale quantity (ASQ) level of 4.2 MMCF (16.4 MMBF). Current policy and projected budgets indicate a total sale program around 5 to 7 MMBF including sawtimber, and products other than logs (POL).



The Ranger Districts continue to see demand for fuelwood and POL sales. Because of the extreme fire season in 2000, the Forest implemented restrictions, which reduced the risk of man-caused fires, and also reduced the amount of fuelwood and post and poles that were harvested. Because of these restrictions mortality volume sold (fuelwood) was below projections for the first time since 1986. The cumulative removal continues to exceed projections (187%), but is down from last year (203%). A more accurate projection of outputs should be derived during the Forest Plan revision process.

Thinning/release (TSI) projects were accomplished on 678 acres in 2000. Over the planning period the Forest has accomplished 115% of the projected amount of TSI, but there still remains a substantial backlog of TSI to be done. A more accurate projection of thinning/release needs should be derived during the Forest Plan revision process.

The Forest completed 264 acres of tree planting and no acres of site preparation for natural regeneration because of the fire restrictions, and certified regeneration without site preparation on 742 acres. Over the planning period the Forest has accomplished 47% of the projected amount of reforestation, up from 45% last year.



According to the Forest database no regeneration cutting of aspen was accomplished in 2000. The Forest Plan objective was to treat 85 acres of aspen annually, but to date the records show only 26% of that projected output met.

**MONITORING REQUIREMENT:
Status of Lands Not Suited for Timber Production**

The status of lands not suited for timber production will be addressed in the Forest Plan revision process that began in FY 2000.

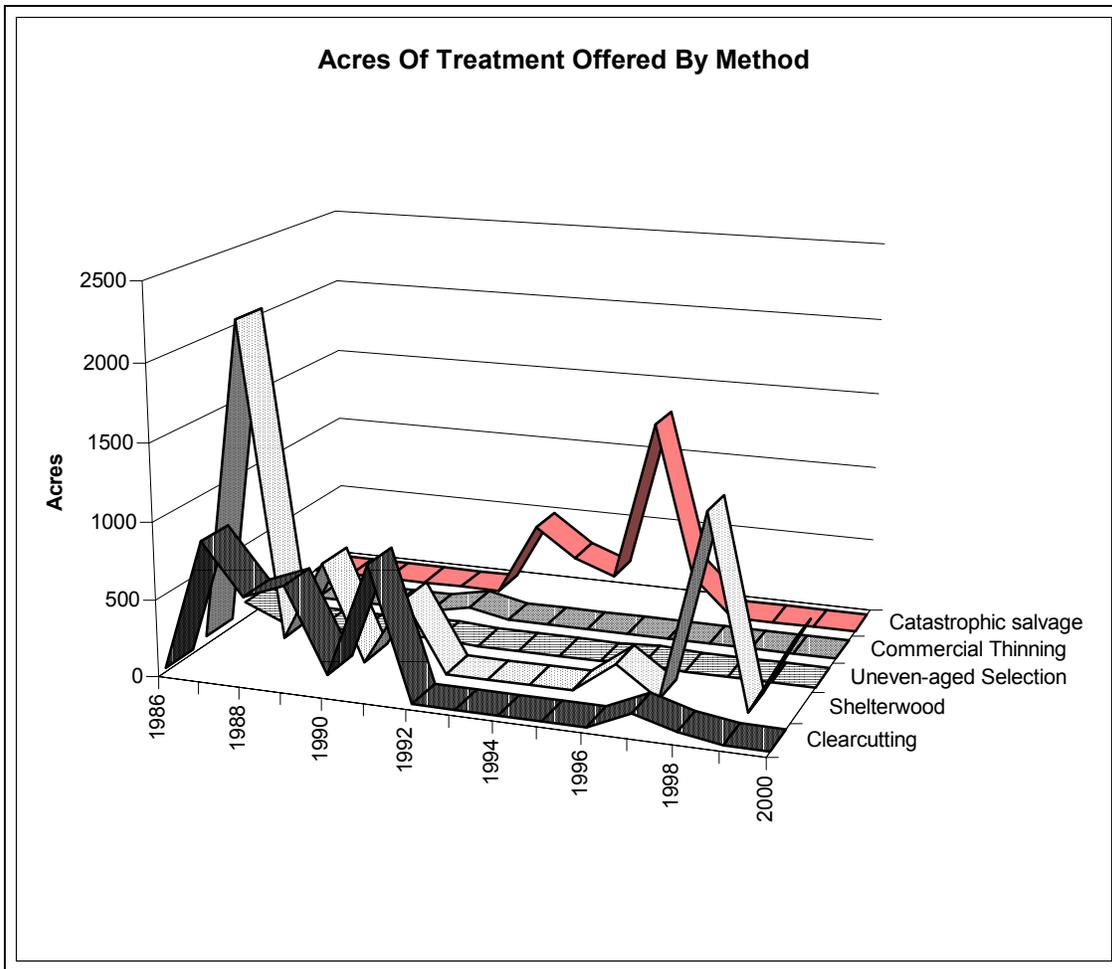
Effectiveness Monitoring

The Standards and Guidelines pertaining to vegetation management have a significant affect on the amount and kind of vegetation management allowed, and the resultant outcomes and outputs available, including desired forest conditions and wood fiber volume offered.

- There is inconsistent interpretation of the Standards and Guidelines and how they are to be administered throughout the Forest. Standards are not being interpreted as a standard, but a minimum, with the optimum level above the Forest Plan standard. The difference between Standards and Guidelines is also inconsistently interpreted, resulting in guidelines being applied as a standard. This has resulted in a different set of standards than those described in the Forest Plan, different outcomes, and fewer outputs than projected.
- The Forest often receives pressure to change Standards and Guidelines when new studies, research, or philosophies are proposed. This pressure must be tempered with the need to apply consistent Standards and Guidelines over the planning period, as the standards and outputs need to be developed and applied in an integrated manner.
- Current Standards and Guidelines for silviculture do not provide a full range of silvicultural methods. The current Regional Guide provides revised Standards and Guidelines for silviculture that if adopted, would help the Forest move towards ecosystem management.
- Monitoring in 2000 has again identified a need for the Forest to clarify the requirements for certification of regeneration. Use of the Regional Guide standards is recommended.

Validation Monitoring

The acres of treatment by method from the Forest Plan are listed on Table 3. Since the plan was implemented, the Forest has not matched this projected mix. Total acres harvested are 41% of the total projected for the planning period, while reforestation acres are 47% of the projected output, and ASQ is 52% of projected output. When the Forest revises the Plan, there should also be a concerted effort to validate the mix of each of these treatment methods.



The Bighorn National Forest management area designations has been found to be too small in size and too numerous in a given watershed to manage for a dominant use on a watershed scale. Watersheds currently do not have a dominant use, or management emphasis, but rather the management emphasis areas are averaged together. This averaging results in management for the average rather than managing for any particular emphasis area. Because of this, management areas are often overlooked in project initiation and implementation. This affects the ability to meet Forest Plan objectives, outcomes and outputs.

TABLE 3 - Review of Activity and Outputs

Forest Plan																				
1991-2000																				
Average																				
																		Total	Total	% of
Activity	Unit of Measure	Projected Output	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Projected Output	Actual Output	Projected Output
Total Programmed	MMBF	16.40	14.50	17.90	21.90	15.00	9.00	9.40	4.00	4.94	3.45	8.74	4.79	4.43	5.67	3.10	4.23	245.0	131.0	53%
Sale Volume Offered	MMCF	4.20	3.30	4.70	5.80	4.00	2.30	2.50	1.00	1.17	0.88	2.16	1.11	1.03	1.15	0.81	0.84	63.0	32.7	52%
Sawtimber Vol. (7"+)	MMBF	14.50	9.85	13.86	12.39	9.72	6.80	6.72	1.40	2.16	0.82	6.48	2.62	1.97	2.85	0.11	2.76	217.5	80.5	37%
Sawtimber Vol. (7"+)	MMCF	3.80	2.58	3.63	3.25	2.55	1.78	1.76	0.37	0.57	0.19	1.57	0.56	0.41	0.63	0.03	0.57	57.0	20.4	36%
P.O.L. (Live 5"-6.5")	MMBF	0.50	0.70	0.50	0.30	0.50	0.20	0.10	0.10	0.13	0.05	0.04	0.38	0.16	0.16	0.13	0.15	7.0	3.6	51%
P.O.L. (Live 5"-6.5")	MMCF	0.08	0.11	0.08	0.05	0.08	0.03	0.02	0.02	0.02	0.01	0.01	0.10	0.04	0.04	0.02	0.02	1.1	0.6	59%
Mortality Vol. (Dead)	MMBF	1.40	4.40	4.00	2.60	3.30	2.00	2.60	2.50	2.59	2.58	2.22	1.79	2.30	2.66	2.86	1.32	20.5	39.7	194%
Mortality Vol. (Dead)	MMCF	0.37	1.16	1.06	0.69	0.87	0.53	0.69	0.66	0.68	0.68	0.59	0.45	0.58	0.48	0.76	0.24	5.4	10.1	187%
Timber Stand Improv.	Acres	400	1060	0	426	280	357	0	200	170	220	519	622	1009	1169	201	678	6,000	6911.0	115%
Reforestation	Acres	360	525	0	0	0	0	0	40	40	242	113	272	355	255	290	264	5,150	2396.0	47%
Clearcutting	Acres	1,194	22	881	555	657	118	852	0	0	0	0	0	124	43	0	0	16,765	3252.0	19%
Shelterwood	Acres	625	52	2,159	108	629	10	458	0	0	0	0	202	14	1227	0	507	9,250	5366.0	58%
Uneven-aged Selection	Acres	100	106	0	0	0	13	17	0	0	0	0	15	0	0	0	0	1,595	151.0	9%
Commercial Thinning	Acres	0	0	0	0	0	0	54	0	0	0	0	0	0	0	0	0	none	54.0	n/a
Catastrophic salvage	Acres	0	0	0	0	0	0	0	486	297	198	1,282	256	0	0	0	0	none	2519.0	n/a
Other	Acres												84	0	10	0	0	0	94.0	n/a
Total of Area Cut	Acres	1,919	180	3,040	663	1,286	141	1,381	486	297	198	1,282	557	138	1280	0	507	27,610	11,436	41%

INSECTS AND DISEASE Program Summary

An aerial survey of insect and disease conditions in the Bighorn National Forest was conducted during August and September of 2000, by Erik Johnson (R-2, Forest Health Management). The survey covered the eastern slope of the Bighorn Mountains and most of the Forest north of Highway 14. The survey was concentrated in these areas because of observed mortality to ponderosa and limber pine over the past few years along the eastern slope, and extensive subalpine fir mortality in the northern Forest. Listed below is the status of insect and disease pest populations noted on the Forest in 2000:

Relatively high levels of **mountain pine beetle** (*Dendroctonus ponderosae*) were recorded in the ponderosa pine forest type on the eastern edge of the Forest. This activity was slightly higher than reported in the 1998 or 1999 aerial surveys. In 1998, there were 1,793 trees killed by mountain pine beetle in concentrated spots and scattered, individual trees. In 1999, a total of 2,241 trees were killed on 1,281 acres. In 2000, 5,909 trees were killed on 2,884 acres. Roughly equal numbers of ponderosa pine were killed on National Forest land and on adjacent BLM, State and private lands. The ponderosa pine zone on the eastern edge of the Forest should be watched over the next few years, to closely monitor the outbreak in that region. Areas experiencing concentrated mortality in the northern portion of the east slope include: along Horse Creek Ridge/Tongue River Canyon, Highway 14, west and southwest of Story, and Rock Creek. High mortality areas in the southern portion of the Bighorns include: Fraker and Gardner Mountains, and Specimen Hill.

Nearly 4,000 acres were observed affected by **limber pine decline** in the aerial survey. Limber pine decline is a result of the combined affects of mountain pine beetle, white pine blister rust (*Cronartium ribicola*), and possibly, needlecast diseases. Monitoring indicates the continued infection spread and mortality as a result of the low-to-moderate infection of white pine blister rust throughout the limber pine cover type. This rust has been estimated to be present in the Bighorn Forest for 30+ years (Brown 1978). Forest surveys have identified increased rust infection in the past 12 years in the Tensleep and Leigh Canyons of the Powder River District. Additional areas include Poverty Flats along the Big Goose road, and the northeast face of the Bighorns. Monitoring has found the rust present in every stand of limber pine on the Forest. Limber pine is a five-needled white pine that is very susceptible to this rust disease (Hoff et al. 1980). Although limber pine has not been a marketable timber species here, it is a main vegetative component for many harsh sites in the Rocky Mountains. Limber pine often grows in pure stands on droughty, windy sites where often no other tree, and sometimes no other vegetation, can grow (Kendall and Schirokauer 1997). It is unknown what type of vegetative cover will follow the limber pine on the harsh sites it now occupies if it does not successfully regenerate.

Significant areas of the subalpine fir on the Bighorn National Forest are currently experiencing **subalpine fir decline**. More than 70,000 subalpine fir on 32,777 acres were affected by subalpine fir decline on Forest Service lands north of Highway 14. This decline is caused primarily by a combination of western balsam bark beetle (*Dryocetes confusus*) attacks and root disease (Armillaria or Annosus). Because subalpine fir retains its red needles after it dies longer than other conifer species, these totals are cumulative from the last 2, 3 or even 4 years. Nonetheless, the amount of tree mortality recorded in the 2000 aerial survey represents a significant increase from the last time this area was flown in 1997.

Spruce beetle (*Dendroctonus rufipennis*) killed an estimated 1,320 Engelmann spruce trees on 1,200 acres in areas north of Highway 14. In particular, areas adjacent to FSR 15 experienced relatively large pockets of spruce mortality. In addition, a mixture of spruce beetle and subalpine fir decline was affecting another 815 trees on 829 acres. The increases in both spruce beetle and subalpine fir decline may be a result of storm events in the mid-1990's that caused large areas of spruce-fir blowdown. Spruce beetle populations are known and western balsam bark beetle populations are suspected to increase in blowdown and then move to neighboring stands.

Douglas-fir beetle (*Dendroctonus pseudotsugae*) continues to remain at endemic levels in the area that was surveyed this year.

The **lodgepole needlecast fungus** (*Lophodermella montivaga*) continues to be on the decline with no known epicenters detected since 1997.

Large areas of dead tops of lodgepole pine continue to be observed throughout its range - these areas appear gray from a distance because of all the 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.

The East Duncum area has also experienced tree mortality in and around past harvest sites. Surveys planned for 2000 did not take place, and need to be rescheduled for next summer.

Gypsy Moth trapping on the Forest and by cooperating agencies off the Forest has been ongoing. No moths were trapped in 2000. Continued detection monitoring is needed to keep this exotic pest from becoming established.

Results of 2000 Aerial Survey of Eastern Bighorn Forest

Pest Agent	Bighorn National Forest		Non-Forest Service lands	
	Acres Affected	Trees Killed	Acres Affected	Trees Killed
Mountain pine beetle on ponderosa pine	1,244	3,277	1,640	2,632
Mountain pine beetle on lodgepole pine	62	41	11	7
Limber pine decline	20		3,932	
Douglas-fir beetle	70	60	16	14
Subalpine fir decline	32,777	71,340	36	115
Mixed spruce beetle and subalpine fir decline	829	815		
Spruce beetle	1,211	1,320		
Total damage	36,213	76,853	5,635	2,768

MONITORING IMPLEMENTATION

MONITORING REQUIREMENT:

Level of Insect and Disease Organism - Compliance with Schedule and Outputs

The 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 and were last completed in 1997. The extreme fire season of 2000 deferred a full survey until 2001. Spot surveys, such as what was accomplished in 2000, are conducted to determine the extent and intensity of specific agents.

Effectiveness Monitoring

Aerial surveys are effective in determining levels of infestation of various pests, but are not cost effective annually. Ground validation and spot aerial survey sampling are necessary to determine the exact Forest pest, population levels, and what, if any management actions may be warranted.

C. SOCIAL COMPONENTS

RECREATION Program Summary

Forest visitation decreased in 2000 by 2 percent. Highway traffic was down by 3 percent on US 14, and down by 6.5 percent on US 16. It is probable that visitor apprehension about wildfires in Wyoming and Montana contributed to these shifts in use. Gallatin Canyon Campgrounds, a division of Canyon Enterprises, Inc., again operated most of our developed recreation sites. Most users were pleased with the service provided by this concessionaire.

All three interpretative sites (Burgess Junction, Shell Falls, and the Medicine Wheel) were operated during the summer season. Use at Shell Falls (350,000 visitors) and Burgess Junction (50,000 visitors) was approximately the same as last year. Visitors to the Medicine Wheel totaled over 13,100, which is equivalent to the 1999 visitation. Interpretative sales through the Rocky Mountain Nature Association totaled \$176,788. Proceeds from these sales pay for interpretative staff and publication of new interpretative materials. The Association operates sales outlets in other National Forests throughout the Rocky Mountain Region and the State Park system in Colorado. The Bighorn National Forest is the top sales producer of all operated outlets. Robert Larson coordinates this program and oversees the operations of all three facilities. Robert recently received the "Outlet Manager of the Year Award" for Region 2.

Newly constructed Tie Hack Campground opened in May 2000. This facility, consisting of 20 camping sites, was completed as part of a mitigation plan to replace a campground flooded by the Tie Hack Reservoir. The 69-acre reservoir supplies the city of Buffalo with drinking water, and provides excellent recreation opportunities including, picnicking, fishing and boating. In addition, the concessionaire upgraded several campgrounds with 25 new fire rings and installation of entrance gates at three recreation sites. Total concessionaire expenditures exceeded \$11,500. Although these repairs were important, a substantial backlog of maintenance remains due to the age of most facilities.

As part of a nation-wide effort, the Forest continued a program of inventorying its developed recreation infrastructure. This includes collecting information on the number, location and condition of such facilities as fire rings, grills, tables, and vault toilet buildings. This data will provide estimates for future funding of backlog maintenance. In 2000, we completed an inventory of 34 recreation sites, primarily on the Tongue Ranger District. In addition, 146 miles of trail were surveyed, or approximately 20 percent of our trail system. As with the recreation sites, trail condition was documented and areas of needed improvements noted.

Participation in dispersed motorized recreation activities continues to grow. Increased use of ATV's during the summer and fall seasons and snowmobile use during the winter season has been reported in most areas of the Forest. This creates challenges for managing the recreation program including law enforcement, maintenance, trail/road damage, and user conflicts. Resource damage problems continue to increase in the areas designated "C" on the Forest travel map. Motorized vehicles in these areas are authorized to travel off of roads and trails. Many miles of user-created trails occur through meadows and streams.

During the summer season, we focused additional resources on some dispersed recreation activities. These included establishing an ATV check station for spark arrestors and law enforcement patrols during the fire ban, full time radio dispatch, and coordination with volunteers for increased presence on the ground.

Volunteer groups and individuals were used throughout the Forest to help perform a variety of duties with the recreation program including trail maintenance, campground and facility maintenance, signing, patrols, visitor contacts, interpretation at visitor centers, and grooming cross country ski trails.

IMPLEMENTATION MONITORING

MONITORING REQUIREMENT:

Developed Recreation Use

In 2000, the Forest-wide recreation visitation in campgrounds and picnic areas was down 10 percent from the previous year, due to the severe fire season. Likewise, use at our visitor centers was down by 5 percent. A closer look at trends along our major travel corridors provides more insight to these general declines. Facilities along US Highway 14 (Big Horn Scenic Byway) and 14A (Medicine Wheel Passage) experienced a small decline in use for 2000, indicating that the overall decline in use of developed recreation sites on the Forest was impacted to a greater degree in the southern travel corridor, and to a lesser degree in the northern corridor.

Campground use was up over 10 percent from 1998. Data indicates that 37 percent of all campground visitors used tents; 47 percent had trailers or truck campers; the remaining 16 percent had motorhomes.

Significant construction projects in 2000 included: contracting for construction of Shell Campground and new restrooms at the parking area for the Medicine Wheel National Historic Landmark.

Operation of most developed recreation facilities continues under the terms of a special use permit reissued to Gallatin Canyon Campgrounds, a division of Canyon Enterprises, Inc., with offices in Bozeman, Montana. Campgrounds were generally maintained in excellent condition.

Volunteers play a critical role in providing public service. We operated Tyrell Ranger Station, as in the past, with volunteers. Offices are not routinely open at times convenient to the Forest visitor and lack of funding limits available options for keeping these facilities open.

MONITORING REQUIREMENT:

Developed Site Facility Condition

Although most developed facilities continue to deteriorate due to their extensive age (many were built during the 1930's with few improvements), some repairs were made in 2000. The concessionaire painted and stained vault toilet buildings and barriers, installed entrance gates on three campgrounds, and replaced 25 fire rings.

We prioritized maintenance at other recreation developments to comply with health and safety requirements (e.g., hazard tree removal, water system testing). The majority of campgrounds need to be redesigned in order to accommodate larger recreational vehicles. Replacement of the interpretive signs and repairs to other on-site improvements at Shell Falls are still needed.

MONITORING REQUIREMENT:

Dispersed Recreation Use and Experience Level

There were three dispersed recreation personnel assigned to Forest patrol during the 2000 summer season. Their duties included maintenance, signing, and law enforcement. These employees are challenged by increasing numbers of recreation users and violations.

Traffic counters on the Powder River Ranger District indicate that for some areas (i.e., West Tensleep Lake Road) on some weekends and holidays, the number of visitors may be exceeding Forest Plan guidelines. This is of short duration, but indicates a need to develop management strategies to deal with increasing visitor numbers. The Forest continues to see the development of new recreational activities (e.g., rock climbing in Tensleep Canyon and Crazy Woman Canyon). Lack of funding prevents adequate monitoring of these and other uses.

During the summer of 2000, one volunteer focused on patrolling the Park Reservoir area. This was a direct result of a decision to resolve travel management concerns made in 1997 (Little Goose/Park Reservoir Travel Management Plan). Increased presence in the Park Reservoir area has reduced user conflicts, limited the number of visitor complaints, and lowered the number of other Forest violations. The Tongue Ranger District also improved signing and made numerous visitor contacts in and around the Black Mountain Road (FDR 16) and the Woodrock Ranger Station.

Dispersed long-term trailer camping continues to be a major concern. Year-round use is increasing and is accompanied by resource damage. Numerous access roads to the same sites or group of sites are created, resulting in soil compaction. Resource damage occurs when soils are compacted to the degree that vegetative growth is inhibited. There is a need to educate the public and increase awareness of the issue of soil compaction and its effects on vegetation.

We completed an inventory of dispersed campsites in the summers of 1998 and 1999 at several major use areas. Twenty (20) percent or more of all sites inventoried exhibited conditions (Frissell Condition Class 4 and 5) that would not meet Forest Plan standards (e.g., unacceptable erosion, tree damage, and lack of vegetation). Inventoried sites will be entered into a GIS database to aid in forest planning.

The number of horse users camping at dispersed sites is increasing, with a greater number of out-of-state recreationists bringing horses to the Bighorn National Forest. In addition to the resource damage and sanitation concerns that result from all dispersed use, horse use carries an even greater impact on resources with trampling of vegetation, damage to trees, and water pollution.

Use during hunting season continues to have a big impact on the resource due to the wet road conditions. Hunter patrols prior to opening day are effective; however, with our limited number of employees it is impossible to contact every camp. Continuation of these patrols is recommended as many problems are resolved as situations arise.

It is further recommended that the Forest revise the 14-day camping order, implement an intensive education program, determine acceptable limits for dispersed camping, and provide alternatives to facilitate this use. This may include creating a larger group use area where campers could pay an established daily fee and leave their recreational vehicles for an extended period of time. This would accommodate those who enjoy social interaction. Other alternatives should address users that prefer sites offering more solitude.

MONITORING REQUIREMENT: Off-Road Vehicle Damage

Evidence of off-road and trail vehicle use continues to increase. The Powder River Ranger District contains the largest (in acres) designated off-road travel area on the Forest. Unacceptable resource damage continues to grow in this "C" area. Due to lack of funds and available personnel, some ATV users refuse to follow established regulations, knowing that the likelihood of being caught is minimal. Young children drive ATV's off-road as well as on the Forest Development Roads. Damage occurs during hunting season with people paralleling roads to avoid ruts, snow, or mud, resulting in an additional tracks being created. Snowmobiles are being used before the legal date (November 16th) by hunters and recreationists. In addition, a lack of maintenance on many secondary roads is contributing to erosion and reduced water quality. It is recommended that the Forest work aggressively to solve these travel management problems.

Ten Violation Notices were issued this year for violation off-road motorized travel regulations. In FY 1999, the Powder River District issued 16 Violation Notices for this problem. Incident Reports and Public reports of illegal motorized vehicle traffic causing resource damage continue to increase. Most vegetation damage incurred should recover within one year **if no further impacts are inflicted, but the remaining wheel tracks continue to promote more use.** **Funding** limits the District's efforts to prevent resource damage from Off-Highway Vehicles (OHV's). The number of OHV's and "pioneered" OHV trails has increased dramatically in the past five years.

A volunteer who patrols the Big and Little Goose areas came across two major incidents which caused damage to facilities and the land. A group of people took out sections of fence at Little Goose Campground, cut live trees, and left trash. In a separate incident, known as the Mud Bog Case, a group of 35 to 40 four-wheel drive trucks created major damage to Forest roads and off-road areas, including riparian areas. These events took place during the first week in June. Although the investigation is still open, 18 individuals have been fined a total of \$7,250 and are required to pay an additional \$12,400 in restitution for resource damage and road repair. The incident at Little Goose Campground has yet to be resolved.

Off-Road Vehicle Damage

The pictures in the *upper left and right*, show the beginning of unmanaged off-road motorized ATV travel. In the *lower left* picture, the results of continued unregulated off-road motorized travel show the loss of the vegetative ground cover and exposed mineral soil. Numerous examples of this activity can be found in the “C” areas on the Powder River District. This type of activity occurs to a lesser extent in the designated “A” and “B” travel areas on the Forest.

**MONITORING REQUIREMENT:
Dispersed Campsite Condition**

Campsite numbers and use of dispersed campsites continues to increase. No inventories were completed. Frissell Condition Class 4 and 5 sites remain less than 20% of the total number of campsites on current inventory and the Powder River District continues to close a (minimal) number of these sites annually.

**MONITORING REQUIREMENT:
Trail Construction and Reconstruction**

Volunteer groups cleared downfall on several miles of trails. These groups included the Cloud Peak and Powder River Back Country Horseman. In addition, the environmental AP Science class and AP Biology class at Sheridan High School volunteered to make trail improvements to the Tongue River Trail and Cave. Approximately 75 students participated in trail maintenance and garbage removal from the cave.

Funds were again available in 2000 to conduct a trail condition survey (deferred maintenance). Approximately 146 miles, or 20% of our Forest trail system were surveyed during the summer. Until this past field season, we relied on outdated survey information to prioritize segments of trail requiring corrective action. Analysis of the 2000 deferred maintenance survey, coupled with observations from field personnel and public trail users, confirms that the priority list of critical maintenance needs is increasing. Overall trail conditions on the Forest continue to decline. Trail erosion with resulting resource degradation is at unacceptable levels.

Deterioration of the Forest trail system bridges is at a critical stage. Lack of funding has prevented routine bridge inspections. Guidelines call for checking approximately 20 percent of trail bridges each year.

Despite a funding shortage, the Forest trails team continues to update and prioritize trail maintenance needs.

**MONITORING ADDITION:
Law Enforcement**

The following table summarizes the number of law enforcement incidents (Incident Reports, Warning Notices, Violation Notices) beginning in 1994. Detailed data on specific types of violations (e.g., timber theft, fire violations, off-road vehicles, etc.) is available at our offices in Sheridan, Wyoming. Reporting incidents is a function of a number of field personnel.

	1994	1995	1996	1997	1998	1999	2000
Number of Reported Incidents	1379	622	1066	1215	784	765	*

* Data for 2000 is not available at this time.

Effectiveness Monitoring

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 ATV's is becoming more popular. The potential for resource damage is much greater with this equipment. All of these demands call for immediate attention. With a renewed emphasis on collecting and analyzing information on operational costs, we hope that additional funding can be justified. Nevertheless, it appears that the public will be asked to help through an even greater use of volunteer programs and/or through a greater share of their resources by initiating new user fees, like the ATV registration law passed in 2001. As stated in previous monitoring reports, management of dispersed recreation is the most important emphasis area for the future.

Validation Monitoring

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

WILDERNESS Program Summary

The Bighorn National Forest was able to fund four seasonal Wilderness Rangers for the field season of 2000. Wilderness use in 2000 was up by approximately 10 percent from the 1999 season. Most other Forest activities showed a decline (2% overall reduction in Forest visitation).

The Forest continued to monitor air quality by intensively sampling water quality in two wilderness lakes. A "visibility camera", aimed at Mather Peaks, operated for its fifth year in monitoring particulate matter in the wilderness.

MONITORING REQUIREMENT: Condition of Use Areas

Monitoring of campsites was redone this year to reflect the change in Standards and Guidelines (September 1998). The campsite values have been revised to include the amount of bare ground created at campsites in high-use lake basins. The Monitoring Requirements (Chapter IV) section of the Forest Plan will need to be updated to reflect this change in campsite monitoring.

The average amount of bare ground per campsite has increased from the 1996 survey. The average bare ground per campsite was 774 square feet in 2000, compared to an average of 623 square feet per site in 1996. This is a negative trend, and with other wilderness monitoring, indicates that further indirect actions may be needed to mitigate the impacts at campsites in lake basins. A ban on campfires in the wilderness at elevations above 9,200 feet began in the summer of 2000. Since research indicates that foraging for firewood increases the size of campsites by a factor of 10, the restriction on campfires was enacted in order to halt the growth in campsite size that is associated with firewood gathering.

The increasing size of bare ground at campsites indicates that our previous management actions have not been successful in preventing the deterioration of campsite conditions in the Cloud Peak Wilderness. Further actions may be necessary in order to stop this downward trend, and visitor input and involvement is encouraged in this process; both wilderness and its users will mutually benefit by their active involvement in the planning, education, and enactment of any new management actions.

Noteworthy changes from 1996 to 2000 Campsite and Dead/Down Woody Material monitoring:

- There are 12 new sites bared enough to inventory since 1996. One lake (Cliff Lake) was not re-inventoried in 2000. One lake (Old Crow Lake) was newly inventoried in 2000. One lake (Otter Lake) had no site in 1996 and did have a new one in 2000.
- While 4 of the lakes have seen decreases in the total bare ground, ranging from 2%-56%, 5 have increased from 13%-123%. The largest decrease is at Misty Moon, and the largest increase is at Lake Helen.
- It was observed by the volunteers that fire rings were still being constructed at most sites above 9,200 feet in elevation, in violation of the campfire closure order.
- The volunteers observed and photographed 2 “survival” structures (one at Lake Marion and one at Lake Geneva) for which numerous live trees had been cut.
- Fuel depth averages in both study and control sites have increased from 1996 to 2000. Much recent blowdown was observed in most areas inventoried. Duff depth averages in study sites has decreased, and in the control sites has increased since 1996.
- The site typically used by a permitted outfitter-guide at Mirror Lake has increased in bare ground by 40% from 1996.

- The difficulty in finding control sites, noted in 1996, has become impossible in some areas, notably the north end of Lake Geneva. Significant damage from picketing horses to live trees was noted at Crystal Lake and Lake Solitude.

MONITORING REQUIREMENT:

Amount and Distribution of Wilderness Use

Use in the Cloud Peak Wilderness is again up about 10 % from the previous year. The summer of 2000 exhibited hot and dry weather conditions similar to those in 1999, and visitors took advantage of the good weather to make trips to the Cloud Peak Wilderness.

Use reports for 2000 totaled approximately 70,500 Recreation Visitor Days (RVD's), just below a 10% increase from the 1999 use of 65,000 RVD's. Average length of stay remains at one night as it has for the last 10+ years. The distribution of users remains at 85% hikers and 15% horse users. The visitation numbers are based on the mandatory self-registration that began July 1, 1994. Compliance with the self-issue registration is 95% for visitors entering at a major trailhead with a registration box. Wilderness visitation remains concentrated at the trailheads accessed from US Highway 16. **More than 80%** of the visits to the Cloud Peak Wilderness occur through access points along US 16.

Effectiveness Monitoring

Revised Standards and Guidelines affecting campsite conditions were monitored in 2000. The new guideline for amount of bare ground per campsite is providing useful trend information. The increase in the amount of bare ground per campsite over a four-year period is an indicator for increased concerns for the health and condition of resources in the Cloud Peak Wilderness.

Visitor compliance with mandatory self-issue registration is approximately 95%, and has improved the confidence level of use estimates for the wilderness. The reported Recreation Visitor Day (RVD's) for the Cloud Peak Wilderness is estimated to vary 10-15% from actual use with mandatory registration. The previous voluntary registration varied by at least twice as much as the mandatory system.

Validation Monitoring

The new Standards and Guidelines established by the Forest Plan Amendment (1998) will be implemented for inventory purposes during the summer of 2001. It is anticipated that the new Standards and Guidelines will more effectively show the trend of campsite conditions.

VISUAL RESOURCE Program Summary

The visual resource of the Bighorn National Forest is managed as one consideration in the development, analysis and execution of projects or activities on the Forest. Management or enhancement of the visual resource has not been identified as part of the purpose and need for any Forest project during the monitoring period (FY 2000).

A visual quality objective (VQO) inventory for the Forest was completed in 1979. This inventory mapped the relative importance of the visual resource in a particular place when compared to other Forest places. The 1985 Forest Plan includes a minimum standard for visual quality as part of the prescription for management areas.

IMPLEMENTATION MONITORING

MONITORING REQUIREMENT: Compliance with Visual Quality Objectives

Field review was completed for three projects. The projects were selected because they involved vegetation disturbance or man-made structures

The LovCom Tower at Bosin Rock Electronic Site is a radio communication tower. The 150-foot tower was completed during the fall 1999 under a special issue permit. Access is via Red Grade Road #26 and Bosin Rock Road #318. The color of the orange radomes mounted on the tower was not reviewed and approved by the Forest prior to construction. The appearance of the radomes varies with atmospheric conditions. A minimum standard for visual quality of modification applies to the Bosin Rock vicinity. The tower does not meet the modification standard for visual quality as it applies to structures.

Harvest in Unit 3 of Caribou Timber Sale was completed during the summer of 2000. A minimum standard for visual quality of partial retention applies in the foreground zone of Pole Creek Road #31 and the L Snowmobile Trail (Road #476). The appearance of landings and slash conditions in the foreground of the L Trail raised some visual concerns. Numerous sapling trees in established landings were killed and not cleaned up. Slash heights were not limited in the sale contract and some slash was piled against green trees. Jackpot burning of slash is scheduled for spring 2001. After burning is complete, a field review will be conducted to assess the need for additional slash treatment to meet the visual quality standard.

New snow fences west of Powder River Pass on Highway 16 (Cloud Peak Skyway – Scenic Byway) were constructed during the summer of 2000. The snow fences are under special use permit to the Wyoming Department of Transportation. A minimum standard for visual quality of partial retention applies to the management area. The snow fences have a more negative visual impact than expected. They do not meet the partial retention standard for travelers on the adjacent Highway.

Validation Monitoring

The 1979 VQO inventory was used in development of the 1985 Forest Plan. The scenery management system (SMS) inventory process was adopted by the Forest Service in 1995. The Forest began an SMS inventory in 1999 and that work continued in 2000. The SMS inventory will be used in revision of the Forest Plan.

HERITAGE RESOURCES Program Summary

East Zone

Personnel on the east zone surveyed approximately 800 acres for heritage resources during fiscal year 2000. The majority of survey was conducted for the re-issuance of long-term grazing permits. Though the east zone did not accomplish a large number of acres in survey, personnel were busy writing inventory reports on large complex projects including the Woodrock Timber Sale and the North Tongue AMP/Watershed analysis. Time was also invested in reviewing a regional prescribed fire agreement among the Forest Service, the State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation, for the purpose of streamlining heritage resource surveys in connection with the prescribed fire program. The Programmatic Agreement should be completed and signed by the summer of 2001.

Public education for the year included three flint knapping demonstrations, one historic photographic display, and a class at Sheridan College. Personnel from the zone held several talks that took place at the Burgess Junction Visitor Center. The programs included the Sibley Battle, flint knapping demonstration, and a prehistoric technology workshop.

West Zone

Approximately 466 acres were surveyed for heritage resources during fiscal year 2000 on the west zone. Of the total, 180 acres were surveyed for the reissuance of long-term grazing permits, and 190 acres were surveyed for Prescribed Burn Plans, the remaining acres were for miscellaneous projects associated with small recreation, facilities, and range projects. In addition to the fieldwork, projects included working on the Regional Prescribed Fire PA, participating in the national training cadre for the Heritage Module of INFRA, and preparing a nomination to the National Register of Historic Places for the Medicine Mountain Cultural Landscape.

Public education for the year included numerous informal talks and 2 formal lectures on the Medicine Wheel National Historic Landmark, as well as two school presentations.

IMPLEMENTATION MONITORING

MONITORING REQUIREMENTS:

Professional Field Evaluation of Two Randomly Selected Projects (Forest Wide)

No projects were examined by east zone personnel.

The west zone personnel evaluated one ground disturbing project for field evaluation. The Shell Water System, a facilities project, was investigated and no damage to any site was noted.

MONITORING REQUIREMENT:

Sample Field Evaluation of Identified Cultural Resource Properties Requiring Protection (any Eligible or Unevaluated Site)

Ten prehistoric heritage resource properties, associated with grazing permit reissuance, were examined on the Tongue District. All 10 properties are being impacted by erosion caused by the presence of roads and cattle grazing, rodent disturbance, and vandalism. The impacts to these sites are considered threatening to their eligible status. At present, mitigation plans are being designed to lessen the impacts. Implementation of mitigation measures is proposed to begin in 2002, and should be completed by 2006.

Nine heritage resource properties associated with the Shell Allotment Management Plan (AMP) and 12 sites associated with the Devil's Canyon AMP were examined on the west zone. Of those examined, six are being impacted by various causes. The impacts are considered potentially threatening. At present, mitigation plans are being designed to lessen the impacts. Implementation of the mitigation measures is proposed to begin in 2001, and should be completed by 2005.

The Medicine Wheel National Historic Landmark was examined in regards to a contract to protect the site from compaction of the soil around the Wheel and to reduce the visual impacts to the site. The project, scheduled for 2000, has been delayed until the summer of 2001.

Effectiveness Monitoring

Two goals are associated with effective Forest Plan Monitoring. They are: 1) *identification of appropriate resource management*, and 2) *initiate actions to reduce deficiencies*. In 2000, the Forest continued its concerted effort in meeting the objective of goal #1. This was accomplished through the grazing permit renewal process, early planning for wildlife and fire projects, and by the initiation and funding of the deferred maintenance program. We need to strengthen our commitment to following monitoring requirements as outlined in the Forest Plan; the requirement of professional evaluation of two field projects is defined in Chapter IV, however, the Forest has not implemented any projects during 2000 that would meet the specified conditions.

The Forest has initiated several Programmatic Agreements (PA's) in the past few years, and will complete a new PA this year for the prescribed fire program. These agreements state specific direction for management of heritage resources, thereby facilitating our meeting goal #2 in reducing deficiencies in the program. The Forest now has standard procedures for reducing the effects from range and travel management activities, and within the near future, prescribed fire. Additionally, the Forest has existing management plans for the Medicine Wheel National Historic Landmark, the Woodrock Tie-Hack Historical District, and is presently working on

plans for historical administrative sites, recreational summer homes, as well as an ethnohistory/ethnographic study of indigenous occupants of the Forest.

The next few years are expected to bring additional challenges to the Heritage Resource Program. In support of the heritage resource database, the Regional Office has funded a data entry position for the purpose of inputting and managing resource data records for the Forest. Additional funding should ensure that the database is fully functional by the end of FY 01. Another boon to our heritage resource technology is the establishment of an agreement with the Wyoming Cultural Records Office to produce a Heritage GIS layer for the Forest. The Cultural Records Office expects to create the draft copy of the GIS layer by the end of FY 01, with the final version ready in FY 02. This project is also funded by the Regional Office, and will be quite an extraordinary accomplishment, given the fact that no heritage resource data existed in our GIS database in FY 00. The new layer will provide a significant complement to our existing GIS database, and serve as an effective tool in the planning, management and evaluation of heritage resources.

Validation Monitoring

The Forest Plan goals and objectives are lacking in most areas. The laws that they were initially based upon have since been amended, and present direction in the Forest Plan is inadequate and/or inconsistent with the new amendments. For example, the Plan provides no direction for setting resource priorities for recreational needs. Also, monitoring requirements should be updated to include reporting the reduction in backlog of unevaluated sites on the Forest. Recent direction from the Washington Office is helping to address these concerns. An assessment of resource heritage assets is being conducted for the purpose of reducing evaluation backlog, and establishing long-term monitoring goals that include annual maintenance priorities for sites that are incurring impacts. As noted above, the heritage resource database will need to be updated to reflect these activities, in order to monitor and analyze trends on the Forest.

Evaluation and Conclusions

The 2000 monitoring program results reflect that the Bighorn National Forest continues to have impacts to heritage resources by natural deterioration, grazing activities, vandalism, and wildlife activities (burrowing rodents). The two main reasons that are associated with deficiencies in the management of the resources on the Forest are: 1) the Forest Plan needs to be amended to give specific direction in the meeting of Federal Law, and 2) funding levels are insufficient to implement the Forest Plan adequately (see Recommendations). However, with the addition of new Programmatic Agreements, new Forest policy, and improved funding orientation, the Forest can reach an acceptable level of heritage resource management within the next few years.

LANDS - SPECIAL USES

Program Summary

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.

We administer 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.

Special Use Staff answered appeals of several recreation residence permit holders whose reappraisals resulted in higher fees. The Forest was upheld in each appeal.

Projects in FY 2000 and ongoing into FY 2001 include the processing of the Tie Hack Campground Withdrawal, meeting the Forest's landline target, resolving various trespass cases, and one potential resolution under the Small Tracts Act. The Forest Land Value Schedule and Common Variety Minerals Schedule are currently being updated by the Region's Zone Appraisal Staff. Cost Recovery Regulations will be implemented in 2001.

The Forest continued its moratorium on the issuance of any new outfitter-guide permits. This is an area of contention with various groups and individuals, but particularly with institutional users (colleges and universities). The moratorium remains in effect due to the lack of a current capacity analysis, and insufficient funding to staff for the administration of current permits.

IMPLEMENTATION MONITORING

MONITORING REQUIREMENT:

Ensure Compliance with Terms of Authorizations and Operating Plans

Inspection and compliance checks are performed to ensure compliance with permit requirements. Due to limited personnel and lack of funding, many permitted uses are not inspected at the frequency mandated to ensure that the terms of the permit are being met. Staffing is such that only elements of health, safety, and environmental protection are administered to standard. Crisis management is more often the norm than not. Lack of Communication Site Plans make the administration of the Forest's Communication Sites difficult at best. Forest Service Directives state that updated Management Plans be prepared for all sites, but limited staffing has been prohibitive.

MONITORING REQUIREMENT:

Effects on Non-National Forest Land Management Practices on Adjacent or Intermingled National Forest System Lands or on Forest Goals and Objectives

Activities such as grazing, timber harvest, building and road construction, and recreation uses on adjoining and intermingled lands continue to increase. Public access to the Forest continues to be diminished due to private owners limiting access through private lands.

Effectiveness Monitoring

The Lands and Special Uses Program complies with the limited direction found in the Forest Plan. Forest Service Manuals and Handbooks provide principal management policy and procedures. Limited funds resulting in understaffing make it impossible to adequately administer all permits to these established standards.

Validation Monitoring

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

FACILITIES Program Summary

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

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

In 1998, the Forest Service determined that more information was needed to accurately identify our maintenance needs. An ambitious five-year inventory and reporting program was initiated to identify annual maintenance, deferred maintenance, and capital improvement needs for the entire infrastructure of the Forest Service. Through this initiative, every road, trail, building, campground, bridge, etc. will be reviewed for annual maintenance needs, deferred maintenance needs, and capital improvement needs over the next five years.

In 2000, the Bighorn National Forest performed condition surveys on 160 different maintenance level 1 and 2 roads (i.e., closed roads and roads open to travel by high clearance vehicles), totaling 229 miles, in an effort to estimate the maintenance backlog on these roads, as well as estimate the current annual maintenance and capital improvement needs of these roads. The roads surveyed in 2000 included a representative sample of the maintenance level 1 and 2 roads on the Bighorn National Forest. After relating work items found in the condition surveys with a deferred maintenance cost guide and applying these representative costs to all the level 1 and 2 roads on the Forest, it was found that the Bighorn National Forest has an annual maintenance cost of \$1,062,840 for all of its level 1 and 2 roads. This factors to a cost per mile of \$683 and \$920 for level 1 and 2 roads, respectively. It was also discovered that the Forest currently has a \$2,227,727 cost associated with maintenance on these roads that has been deferred over the years, or a deferred cost per mile of \$886 and \$2,316 for level 1 and level 2 roads, respectively. Annual funding for road maintenance on the Bighorn National Forest is currently around \$400,000 per year.

In 2000, routine maintenance was performed on approximately 442 miles of road by force account crews, contracts, and by permit holders according to the permit requirements. No new

roads were constructed and 7.3 miles were reconstructed. Approximately 3.6 miles of road were decommissioned in 2000.

The Forest leased a road grader for 3 months of the 2000 field season, for use in conjunction with the Forest's fleet of construction equipment. This proved to be a very efficient means for performing maintenance on level 3, 4, and 5 roads (roads maintained for different levels of passenger vehicle travel), as the two motor graders were used in tandem, and the number of passes required per road was greatly reduced. However, later in the season, the Forest lost its grader operator and had trouble hiring a qualified operator to run the second blade. This reduced efficiency toward the end of the season, and precluded the maintenance crew from working on higher priority roads for a second time at the end of the summer (these roads include Tie Hack, West Tensleep, Big Goose, and Burgess).

Inspections were performed on 32 different administrative buildings during the 2000 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. Water system enhancements were made via force account for Shell Ranger Station and Shell Campground. Technical support was also provided in the areas of special uses, interdisciplinary teams, accessibility, safety, and resource issues as required.

IMPLEMENTATION MONITORING

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

MONITORING REQUIREMENT:

Arterial, Collector and Local Road Construction and Reconstruction

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

Effectiveness Monitoring

During project implementation, monitoring is conducted through onsite inspections by qualified personnel. Deviations from the planned design are accomplished as necessary to account for a change in conditions or a plan oversight. Input from other specialists is sought as conditions warrant. Final acceptance of contracted projects by the appropriate authority is required.

Validation Monitoring

Construction projects are monitored by personnel during the performance of their routine duties. Changes in future design or modification of maintenance activities are incorporated as necessary to meet management objectives.

D. RECOMMENDATIONS

INSECTS AND DISEASE

1. It is recommended that the Forest, through the Forest Health Management Service Center in Rapid City, continue to schedule a Forest flight for pest activity every third year (the next flight should be scheduled for 2001). Further, it is recommended that the monitoring requirement currently in the Forest Plan be changed to reflect surveys every three years and spot surveys as needed, rather than the 800,000 acres each year.
2. The Forest should continue to monitor the mountain pine beetle, and work with effected communities and adjacent landowners. Because of limited access to infected federal lands, there may be few opportunities for preventative actions and salvage on the Bighorn National Forest.
3. If infection levels of white pine blister rust become unacceptable to forest managers, then suppression efforts could be used to reduce the disease incidence in these areas. Thinning limber pine stands to reduce susceptibility to mountain pine beetle (*Dendroctonus ponderosae*), and regeneration of limber stands may assist in reducing white pine blister rust infection. This may also help mitigate some of the harsh conditions of limber pine sites, promote tree growth, and improve resistance to white pine blister rust disease. In addition, the Forest should begin to collect seed from phenotypic resistant limber pine for storage in the seed bank and later restocking of effected sites.
4. It is further recommended that the Forest continue to work with the Rapid City Forest Health Management Center in monitoring to determine the extent of known populations of insects and diseases of the Forest.

TIMBER

1. The Forest must emphasize the process of assuring adequate regeneration on regeneration treatments, including aspen regeneration and non-traditional treatments. Suitability for timber production of forested lands should be reviewed in all NEPA documents where treatment of woody vegetation is proposed.
2. Update silviculture Standards and Guidelines to those 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.

3. Emphasize the importance of requiring silvicultural prescriptions for all vegetative manipulation.
4. Include in the program budget adequate funding for TSI thinning and release, and reforestation both from sale area receipts and appropriated funds.
5. Maintain and validate the "needs" reporting in RMRIS for reforestation, release, and thinning. This can be a valuable tool to monitor the regeneration activities on the Forest, but it must be maintained to be effective.
6. 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.
7. Require that all quantifiable outputs be reported through the Forest database. This would ensure tracking of our accomplishments and accountability of their completion.
8. Standards and Guidelines need to be reviewed and Forest-wide interpretation documented, so they can be applied consistently and in consort with objectives, and outputs adjusted accordingly.

HERITAGE RESOURCES

1. The Forest Plan needs to be amended to address changes necessary in the management of the heritage resource. More specific statements in the "General Direction" and "Standards and Guidelines" sections of the Plan relating to existing laws and procedures need to be included. The Forest Plan should reflect a 1988 Amendment to the Archaeological Resource Protection Act, Section 14(b) that requires the preparation of a schedule for surveying lands that are likely to contain the most scientifically valuable archaeological resources.
2. The Forest Plan needs to ensure that aerial spraying to control pests and noxious weeds not be conducted without protective measures in areas containing petroglyphs and pictographs, or in un-inventoried areas containing rock outcrops, cliff faces, or rock overhangs. Recent advances in analytical techniques allow for the dating of petroglyphs and pictographs through sensitive chemical ratios.
3. The Forest, through planning and budgeting, needs to develop a Heritage Resource Program that goes beyond meeting compliance standards. Protection of our Heritage Resources for future study and enjoyment by the public is necessary.
4. The Forest needs to incorporate a paleontological resource management program.
5. The Forest should enter into an agreement with the Wyoming State Historic Preservation Office that deals with the acceptance of impacts to all but the best examples of resource types (e.g., the best tie-hack cabins; the best teepee ring sites). The end result of the agreement would be a reduction in costs.

6. With the implementation of the new regulation, 36 CFR 800, the Forest needs to amend the Forest Plan or enter in agreements with Indian tribes, defining how the Forest will consult with tribes.
7. The Forest Plan emphasizes the management of Heritage Resources in relationship to Section 106, of the National Historic Preservation Act. The Forest Plan needs to incorporate direction to cover all pertinent laws, such as Native American Graves and Repatriation Act, and Preservation of Historical and Archeological Data, as well as other federal direction that carries the weight of law, such as Executive Order 13007.

SOILS AND WATERSHED

1. Ensure that all aspects of project decisions are identified and funded through the annual budget process. This should include monitoring activities for the soil and water resources. Periodic project reviews should be conducted to ensure NEPA decisions are being implemented in whole.
2. Continue to establish Best Management Practices during project design and then assure they are properly implemented and maintained.
3. Emphasize soil and water protection measures during project design and implementation. Ensure that monitoring of protection measures is conducted on a regular basis.
4. Increase emphasis on monitoring of special use permits related to water conveyance systems, septic systems, and instream flows.
5. Conduct landscape scale analyses in order to assess the existing conditions within large watersheds on the Forest.

RECREATION

1. Ensure that mitigation measures are carried out during project implementation.
2. Adjust and clarify both capacity figures and ROS guidelines in the Forest Plan.
3. Initiate an intensive education and law enforcement program of off-road vehicle use and dispersed camping. Consider the elimination of off-road vehicle areas (“C” areas on our Forest maps).
4. Develop strategies for collecting reliable recreation use statistics and in defining recreation resource assets.
5. Secure more staff time and outside Forest/Agency involvement in monitoring.
6. Recognize that personal perceptions, needs, and values are a part of ecosystem management.
7. Apply land management prescriptions to larger blocks of land in future planning.
8. Ensure adequate funding for trail maintenance and other Forest recreation programs.

9. Place more emphasis on development of partnerships and the use of volunteers to accomplish objectives.

FACILITIES

1. Emphasis should be placed on maintaining the portions of existing infrastructure needed for long term Forest management.
2. The roads and buildings that are no longer needed or those that have inadequate funding to maintain them should be identified for disposal.
3. Maintenance responsibilities should be shifted to permittees and other users where appropriate.
4. A Capital Improvement Program should be developed to address the problems of worn out roads and obsolete buildings.
5. Infrastructure management tools such as databases, Geographic Information Systems, and Maintenance Management Systems should be incorporated into a unified system and kept current to aid in the ongoing evaluation and management of the Forest Service infrastructure.

LANDS – SPECIAL USES

1. The Forest should continue to pursue shared duties with neighboring administrative units, in order to improve the effectiveness of its Lands and Special Uses program through a teamwork approach.
2. There is a demonstrated need to establish a full-time Resource Assistant or Resource Clerk position to handle the Forest-wide impact of the Special use Data System (SUDS), enabling Forest and District Staff to concentrate on permit administration and other Lands duties.
3. An effort should be made to recognize the significant workload of the Lands and Special Uses Staff at the Ranger District level, and to provide adequate funding and staffing accordingly.

WILDLIFE

The Forest Management Indicator Species (MIS) were utilized in Forest planning because they were perceived as a surrogate for other species to assist in managing for viability of fish and wildlife species, and to display the effects of alternatives for managing the Forest at the planning level. MIS were selected because “their population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality.”

1. The MIS list should be reviewed for adequacy in relation to required habitat, population trend information, and monitoring. **It should be noted that population and/or trend data for MIS is not always available or reliable. Likewise, scientific literature has pointed out the challenges and inadequacies of the MIS concept.**

RESEARCH IDENTIFIED

HERITAGE RESOURCES

The Forest contains approximately 340 unevaluated heritage resources properties. Because of legal requirements, these properties must be managed as though they are eligible to the National Register of Historic Places. Research is needed to determine proper NRHP status; the findings could result in reduced long-term management costs, as several sites would be identified as non-eligible, and the Forest would no longer be obligated to manage them. Due to a recent agreement with the University of Montana, direction from the Forest Service Office in Washington (i.e., deferred maintenance assessments), and recent PA's (Range), the Forest is taking steps to achieve numerous goals in the heritage resource program. However, it will be a few more years before personnel can measure the full effects of these actions.

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