

**Forest Plan
Monitoring & Evaluation Report
Shoshone National Forest**

Fiscal Year 1998



Prepared by
Shoshone National Forest Planning Staff
March 1999

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United States
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Shoshone
National
Forest

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Date: March 31, 1999

Subject: Monitoring And Evaluation Report Certification

To: Regional Forester

I have reviewed the Shoshone National Forest annual Monitoring and Evaluation Report for fiscal year 1998. Analysis associated with project implementation under the Forest Plan indicates that the Shoshone National Forest Land and Resource Management Plan, as currently amended, is still valid and sufficient to guide implementation throughout the coming year.

The Shoshone National Forest is participating in an interagency assessment of winter use in the Greater Yellowstone Area. The assessment addresses conflicts and issues associated with winter use. Once the assessment becomes final, the Greater Yellowstone Coordinating Committee will respond with additional direction. The Shoshone plan may need to be updated to incorporate explanatory information, additional programmatic direction dealing specifically with winter use, management standards and guidelines and monitoring. Any necessary changes will be handled through the revision process.

The Chief of the Forest Service has issued an interim policy placing an 18 month moratorium on road construction or reconstruction in selected areas of the Forest. This interim policy and the resulting final regulation changes to road management direction may need to be incorporated into the Forest Plan. This and other more substantial changes to the Forest Plan will be addressed at the time of revision.

/s/ Rebecca Aus

REBECCA AUS
Forest Supervisor

enclosures: 1998 Monitoring Report



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INTRODUCTION

Monitoring is the preliminary step in the process of deciding whether or not to amend or revise the Shoshone's 1986 Forest Plan. The statutory purpose for monitoring stated in the National Forest Management Act is to ensure that the management system selected in the Forest Plan "will not produce substantial and permanent impairment of the productivity of the land" [16 U.S.C. 1604(g)(3)(C)]. In order to avoid this result, Forest personnel monitor and evaluate the data collected to determine how well Forest Plan objectives are being met and how closely Forest Plan Standards and Guidelines have been applied. The regulations also allow evaluation on a sample basis rather than a comprehensive basis.

Once the report is completed there are two additional steps in the process of deciding whether to amend the Forest Plan. First, an interdisciplinary team evaluates the data collected through monitoring and recommends to the Forest Supervisor whatever changes the team deems necessary. Second, at some point the Forest Supervisor reviews the team recommendations and makes a decision whether or not change is warranted in the way the Forest Plan is implemented.

The following report evaluates Forest Plan implementation during fiscal year 1998. Additional multi-year data is presented in some cases in order to provide perspective on the current state of Forest Plan implementation.

Lower than anticipated budget levels have caused monitoring and evaluation to be less comprehensive than originally envisioned in many cases. However, monitoring efforts have been sufficient to allow the interdisciplinary team to evaluate implementation of the Forest Plan and make recommendations for the Forest Supervisor's consideration. Shoshone National Forest employees have become increasingly creative at implementing the Forest Plan and monitoring under existing budget levels. Some of the approaches noted in this report such as working with volunteers, permittees, special interest organizations, educational institutions, other agencies and National Forests, will become increasingly common as the Forest becomes more adept at developing alternative ways of getting work accomplished.

This report evaluates Forest Plan implementation under criteria from the 1986 Shoshone National Forest Plan as amended. The report concludes with the interdisciplinary team recommendations to the Forest Supervisor. Some of the recommended changes may be implemented through Forest Plan amendment or revision.

AIR RESOURCES

Effects of Other Resources on Air Quality and Air Quality Related Values

Precipitation samples and weighing rain gauge charts were collected every Tuesday at the National Atmospheric Deposition (NADP) site in South Pass City, Wyoming. Measurement of the sample, pH and conductivity tests were performed in the office lab. Consistent with NADP sampling protocol, the samples were sent to the Central Analytical Laboratory in Illinois for further chemical analyses.

Air Quality Related Values (AQRV) were monitored at two wilderness lakes in Class I and II airsheds: Ross Lake in the Fitzpatrick Wilderness, and Lower Saddlebag Lake in the Popo Agie Wilderness. Water samples as well as zooplankton and macroinvertebrate samples were collected at both lakes as indicators of water quality. Sampling took place in mid-season (summer), and in early and late season at the inlet and outlet of each lake, to monitor the effects of deposition on water quality.

In FY 98, AQRV wilderness lake sampling was also performed by the National Outdoor Leadership School for the Forest Service at 12 lakes in the Wind River Mountains. These were synoptic surveys (one-time water samples to determine baseline chemistry) of low-alkalinity lakes following Environmental Protection Agency protocol.

AQRV lake monitoring data is being entered in the Natural Resource Information System Air Module on the Bridger-Teton, and will be available in the future on an Internet site. The AQRV lake sampling data continues to be evaluated by Jill Baron of the National Biological Survey at Colorado State University (Fort Collins). This baseline data and analysis using the Model of Acidification of Groundwater in Catchments (MAGIC) might be incorporated in the Southwest Wyoming Technical Air Forum (SWWYTAF) database's next issuance.

Monitoring of NADP and AQRV sites on the west side of the divide of the Wind River Mountains, and program management, program oversight, and data processing for the Shoshone program are performed by Terry Svalberg of the Bridger-Teton National Forest.

Evaluation

Monitoring of air quality at the South Pass City NADP site is funded by SF Phosphates as part of their Wyoming Department of Environmental Quality (DEQ) Prevention of Significant Deterioration operating permit. Summaries and trend analysis for this and other NADP sites are available on the Internet [<http://nadp.nrel.colostate.edu/NADP>]. The DEQ along with other agencies continually analyzes this information. The SWWYTAF has incorporated our NADP data along with that of the Bridger-Teton's NADP data as baseline data used in the CALPUFF model. CALPUFF incorporates air quality, meteorological, and emissions data to track emissions and acid deposition for monitoring air quality across southwestern Wyoming. This model can enhance our monitoring program and will be used by other government agencies and industry in the planning and permitting process.

AQRV synoptic lake surveys have located several very sensitive lakes with acid neutralizing capacity (anc's) of less than 25, which is among the most sensitive in the nation. This alkalinity is even lower than our established lake monitoring sites (anc's ~50-80), and can be sampled in the future as very sensitive indicators to acid deposition. With the continued AQRV lake monitoring, statistical analysis will be possible where general trends might indicate increased nitrate, sulphate, and phosphate acidification of lakes.

CULTURAL RESOURCES

Compliance with Cultural Resource Regulations (36 CFR 800) (43 CFR 10) (36 CFR 296)

The main purpose for monitoring compliance with cultural resource regulations is to ensure that cultural/heritage resources are being protected. The 1998 Monitoring Plan (Appendix A) identified three areas to be monitored in FY 98 for compliance with the regulations listed above. The plan involved 1) visual assessment of site conditions at 10 sites on the National Register of Historic Places, 2) visual examination of 20-25 sites determined eligible for listing on the National Register of Historic Places, and 3) visual examination of areas with a high potential for heritage resources and a high probability of impacts associated with livestock grazing. The third monitoring area is part of a coordinated effort between the Shoshone National Forest and a number of other agencies.

In FY 98 monitoring of the cultural resources program was not performed. The Forest with the assistance of the Wyoming State Historic Preservation Office (SHPO) and other agencies are working together to remedy the situation. The FY 99 report will update monitoring for this resource for FYs 98 and 99.

FACILITIES

1. Road Construction/Reconstruction (Local, Arterial, Collector)

In FY 98, two miles of new local road were constructed; 0.7 miles of local road and 4.0 miles of collector road were reconstructed. Of the miles of reconstruction, 4.1 were part of a national program to correct water quality-related problems associated with the Forest's transportation system. On the 4.1 miles, culverts were added, existing drainage was improved and spot gravel surfacing was added in areas where the road surface was rutted or eroding. This work represents approximately 36% of the average annual Forest Plan projection for new local road construction, 37% of average annual local road reconstruction, and 235% of the average annual for collector road reconstruction.

Evaluation

As noted in the FY 97 Monitoring and Evaluation Report, deviations from the Forest Plan projections continue to occur. The road construction and reconstruction programs on the Forest have been almost totally dependent on the timber sale program. Roading for support of the timber program is kept to the absolute minimum necessary to harvest the

timber and protect the surrounding resources. For various reasons, timber sales with proposed road work have not sold. The trend away from new construction and into reconstruction also reflects the results of the “no net increase” in roads policy of the Forest Plan amendment (1994).

In the next few years there will be a local and national emphasis on correcting erosion-related problems with Forest Service roads. It is anticipated that heavy maintenance and road reconstruction on local and collector roads will increase and continue to be at levels above Forest plan averages.

It is recommended that during Forest Plan revision, the number of miles of new and reconstructed roads be evaluated with respect to the timber program and the proposed national road policy.

2. Roads Closed (System Miles Closed by Project Activities)

In FY 98, two miles of local road were closed after completion of timber sale activities. The two miles were new roads which were reconstructed by timber sale activities. At the end of FY 98, there was an inventoried total of 288 miles of closed road on the Forest.

Evaluation

Table III-1 in the Forest Plan shows that there should be 99 miles of roads closed on the Shoshone National Forest each year. The inventoried number of closed miles would indicate that the Forest is at 291% of its average annual accomplishment. As indicated in the FY 97 report, this probably indicates that the Forest needs to continue to look at its closed roads and evaluate them for decommissioning as roads. This should be done at the time of plan revision.

3. Roads Obliterated (Road Miles Obliterated by Project Activities)

Miles of new forest development road constructed are measured against road miles obliterated (decommissioned) so that for each running five-year period, beginning October 1, 1994, the cumulative number of new miles of forest development road constructed does not exceed the cumulative number of miles of road obliterated (decommissioned) in the same five-year period of time.

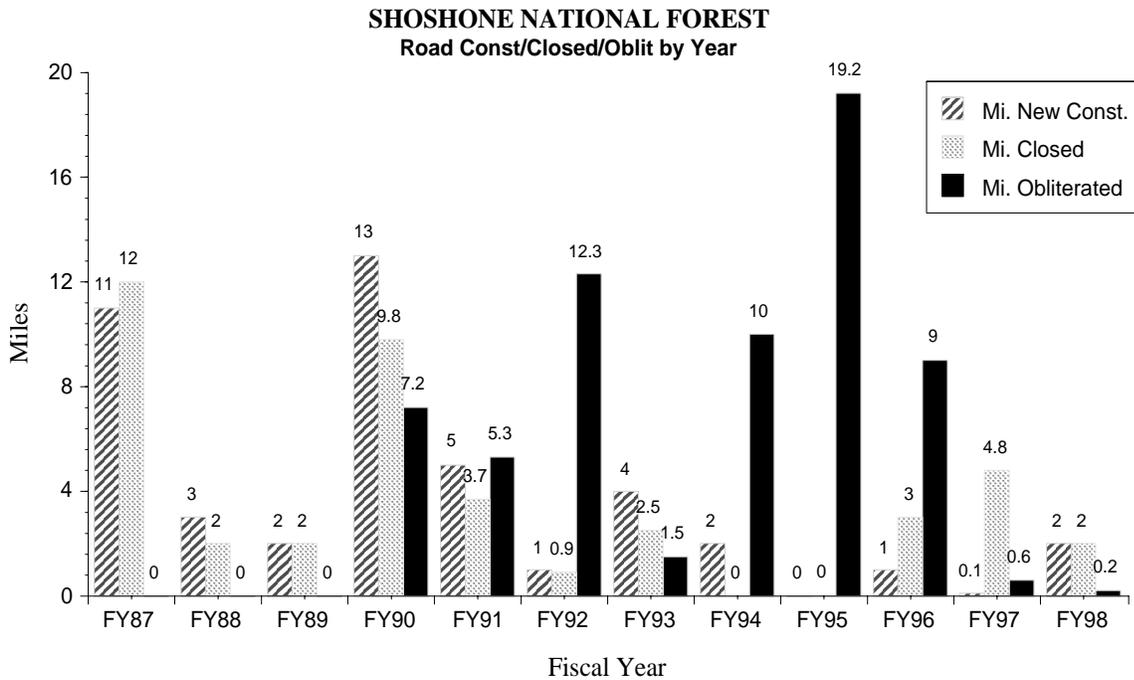
In FY 98, 0.2 miles of road were decommissioned. The Forest Plan projects an average annual 7.6 miles for decommissioning (obliteration). In FY 98, the Forest met only 3% of that projection. The five-year average for decommissioning is 7.8 miles and the average since 1988 has been 5.4 miles per year.

At the end of the fiscal year, the five-year net of roads constructed/decommissioned stood at negative 33.9 miles, indicating that over the past five years, 33.9 more miles of road had been decommissioned than new miles of road constructed.

Evaluation

The fact that the Forest is not within $\pm 15\%$ of the projected average annual miles of road obliterated, is not a cause for concern. The Forest is committed to an orderly process of road decommissioning. New national road policies are expected in the next one or two years; there will be an emphasis on decommissioning existing roads which are no longer needed. The Forest expects to continue an aggressive program of road decommissioning.

The following chart summarizes road construction, obliteration and closing for the Forest:



4. Level 1 Road Maintenance (Miles of Level 1 Maintenance Accomplished)

Level 1 maintenance was performed on 21.5 miles of forest development roads in FY 98. Because Level 1 roads are by definition closed roads, the Forest also monitors the effectiveness of road closures. No problems were reported with the closure of these roads. Forest Plan average annual output for Level 1 maintenance is 332 miles. Actual miles maintained were 7% of this total.

Evaluation

Since priority is given to Level 3, 4, and 5 roads where public health and safety are a significant concern, Level 1 road maintenance is the lowest priority for maintenance. At current budget levels, Forest Plan level road maintenance activities cannot be achieved. The Forest has adopted a policy of completing at least 25% of the Level 1 road maintenance each year. This goal is more attainable than full Level 1 maintenance on all Level 1 miles each year.

National policy for deferred maintenance requires that each mile of road receive a condition survey once every 5 years (20% per year). This policy will be implemented in FY 2000 for the Forest's Level 1 roads. National policy requires that all Level 3, 4, and 5 roads be surveyed in FY 99.

It is recommended that during Plan revision, the average annual output for Level 1 road maintenance be reviewed.

FOREST PLAN BUDGET

Actual Costs of Applying Management Direction from the Forest Plan

The Shoshone National Forest Land and Resource Management Plan (Forest Plan) published in 1986, estimated a budget level necessary for implementation of the mix of goods and services it projected. This monitoring item was intended to track the actual costs of Forest Plan implementation and to verify assumptions made in the plan. Since 1986 changes have occurred in the budgeting process including changes in the fund codes used to track dollars allocated to a particular resource area.

Evaluation

The total 1998 expenditures for the Shoshone National Forest represent approximately 63% of Forest Plan projections (Table 1). Although fluctuations in funding occur on an annual basis within particular resource areas, the overall trend in the last decade has been downward. The Forest's ability to implement Forest Plan management direction depends on the budget allocated by Congress.

**Table 1. Comparison of FY 98 Expenditures to Forest Plan
Full Implementation Budget (Thousands of 1998 Dollars)**

| Cost Center and Cost Center Components | Fund Codes | FY 98 Expenditure | Forest Plan |
|---|--------------------|----------------------|----------------|
| Ecosystem Planning | | | |
| Inventory and Assessment | NFIM | 917 | 950 |
| Planning and Monitoring | NFEM | 71 | 0 |
| | NFLP | 49 | 100 |
| Recreation and Wilderness | | | |
| Recreation Management <i>Includes Facility and Trails Construction and Maintenance</i> | NFRM/NFRN | 766 | 927 |
| | NFTR | 231 | 343 |
| | CNTR (non-CIP)** | 93 | 410 |
| | CNRN (non-CIP)** | 28 | 19 |
| | CNRF (non-CIP)** | 68 | 150 |
| Heritage Resource Mgt. | NFHR | 42 | 103 |
| Wilderness Management | NFWM | 372 | 380 |
| Cooperative Work | CWFS, CWKV * | 2 | 0 |
| Wildlife and Fisheries | | | |
| Wildlife Habitat Mgt. | NFWL | 156 | 431 |
| Inland Fisheries Mgt. | NFIF | 68 | 159 |
| TE&S Species Mgt. | NFTE | 224 | 386 |
| Cooperative Work | CWFS, CWKV * | 8 | 0 |
| Rangeland Management | | | |
| Grazing Management | NFRG | 175 | 375 |
| Rangeland Vegetation Mgt. | NFRV | 114 | 150 |
| Cooperative Work | CWFS, CWKV *, RBRB | 36 | 81 |
| Timber | | | |
| Timber Sales | NFTM | 294 | 495 |
| | SSSS | 165 | 112 |
| | CNTM | 48 | 75 |
| | PCPT | 0 | 0 |
| Reforestation & Timber Stand Improv. | NFFV | 201 | 250 |
| Cooperative Work | CWFS, CWKV *, BDBD | 109 | 24 |
| Water, Soil and Air | | | |
| Soil, Water, & Air Mgt. | NFSO | 102 | 196 |
| Watershed Improvement | NFSI | 72 | 205 |
| Cooperative Work | CWFS, CWKV * | 6 | 0 |
| Minerals Management | | | |
| Minerals Management | NFMG | 55 | 222 |
| Infrastructure Management | | | |
| Real Estate & Special Use Management | NFLA | 105 | 162 |
| | NFLL | 30 | 26 |
| | LALW | 5 | 31 |
| Road Management and Maintenance | NFRD | 279 | 694 |
| | CNGP (non-CIP)** | 22 | 250 |
| Facility Maintenance | NFFA | 82 | 296 |
| Cooperative Work | CWFS, CWKV * | 7 | 0 |
| Protection Of Basic Resources | | | |
| Fire Protection Mgt. | WFHF | 145 | 350 |
| | WFPR | 527 | 939 |
| Cooperative Law Enforcement | NFLE | 51 | 26 |
| Cooperative Work | CWFS, CWKV * | 0 | 0 |
| General Administration | | | |
| General Administration | NFGA | 1,007 | 1,341 |
| GRAND TOTAL | | 6,732 | 10,658 |

* CWKV, CWFS -- activity codes were checked to properly apply to the correct cost center.

MINERALS

Compliance with Terms of Operating Plans and Consistency with Forest Plan

1. Locatable Minerals

Notices of Intent and Plans of Operations are the mechanisms used to authorize mining ventures. Mining claims are recorded with the Bureau of Land Management (BLM). Claimants initiate actions with the surface management agency when they file a Notice of Intent. If the proposed activity identified in the Notice of Intent is likely to affect resources significantly, then a Plan of Operations which outlines the details of the operation may be requested from the claimant. If an evaluation of a Notice of Intent determines that a proposed activity will not significantly affect resources, the District Ranger may approve the Notice of Intent without a Plan of Operations.

Inspections of operations for compliance with the Notice of Intent or approved Plan of Operations are conducted by the Forest minerals staff. In 1998 there were four new Notices of Intent filed and one approved Plan of Operations inspected. All were in compliance. Clovis Minerals reported that they intended to file a new Plan of Operations to conduct exploratory sampling on Roundtop Mountain, Washakie Ranger District. However, the company never filed a new Plan of Operations.

In July citations were issued to individuals conducting mining operations without authorizations. The individuals were crushing mine tailings material on the Clovis Minerals claims located on Roundtop Mountain. The operation caused some minor surface disturbance and damage next to the existing mine adit portals. The owners of the claims indicated that they were possibly going to pursue civil damages by the illegal operators, but nothing additional has been heard concerning the case.

Evaluation

All authorized operations were evaluated against the Forest Plan Standards and Guidelines, and the approved Notices of Intent and Plan of Operations. The Shoshone Forest will continue to inspect mineral operations for compliance with the Plans of Operations and Notices of Intent, along with investigating any potential illegal or unauthorized activity.

There is a growing interest in recreational dredging. Light weight and low cost equipment is becoming more readily available to the average person to conduct recreational suction dredging. More frequent inquires into recreational/suction dredging opportunities on the Forest are being made by the public each year.

2. Leasable Minerals

Operating Plans for leasable minerals (primarily oil and gas) are processed and implemented in a different manner than those for locatable minerals. A company proposing ground disturbing activities for leasable minerals must have possession of a valid lease for the land on which the activity is proposed. Under the Forest Plan and BLM regulations, several staged

processes are used to authorize, implement, and monitor ground disturbing activities. These are:

- identification of National Forest System lands that are available for leasing, advertising lease sales (BLM), and issuing leases (BLM with USFS concurrence)
- receiving (BLM), analyzing (USFS) and approving (BLM) proposals for surface operating plans for exploration; monitoring of approved surface operations (USFS)
- receiving (BLM), analyzing and approving (BLM and USFS) proposals for well or field development
- monitoring surface activities at production sites (USFS)
- abandonment and restoration of wells or fields (BLM and USFS)

In 1987 Congress passed new laws regulating oil and gas leasing. Both the USFS and BLM then promulgated new regulations governing oil and gas leasing. As a result of the new laws and regulations the Shoshone National Forest prepared an Environmental Impact Statement (EIS) to amend the 1986 Forest Plan to include provisions of the 1987 law. The EIS was completed in 1992 and a Record of Decision (ROD) approved in December of 1995. From April of 1990 to the approval of the ROD no leasing was taking place on the Forest.

The Record of Decision for the Oil and Gas Environmental Impact Statement was administratively appealed and the decision upheld. A lawsuit was subsequently filed in Washington D.C. District Court by eight local conservation groups. The Earth Justice Defense Fund argued the appellant's case in the lawsuit. The courts ruled in favor of the Forest Service in the suit, upholding the ROD and Oil and Gas EIS. This ruling was appealed and on January 15, 1999 the United States District Court of Appeals for the District of Columbia issued a decision on the *Wyoming Outdoor Council, v. United States Forest Service*. The courts concluded that the Forest Service's interpretation of its regulations was not erroneous and affirmed the judgement of the district court upholding the Forest Service's leasing decision.

The upholding of the ROD and Oil and Gas EIS is a significant decision for the Forest Service and the Forest's leasable minerals program. The validation and verification process was a key appeal issue and it was determined that the Forest was interpreting and implementing the process correctly and effectively.

One Application for Permit to Drill (APD) was received in 1997 and carried into 1998 - Scott Well #1 exploratory well. The proponent for the APD was originally going to perform the necessary NEPA analysis for the exploratory well, but in August of 1998 the same proponent rescinded and requested that the Forest conduct the necessary NEPA analysis. The proposed action has been incorporated into the Ramshorn Vegetation Management Analysis.

Completion of the Lava Mountain APD was accomplished in the early fall of 1998. The well pad location was recontoured and reclaimed, along with a short access road which was completely obliterated. Approximately thirty trees were transplanted from the adjacent forest stands onto the well site location. The trees range from six to twelve feet in height. After transplanting the trees the entire site was mulched, fertilized, and hydro-seeded. The site will be monitored in 1999 to determine the effectiveness of the revegetation treatment.

Evaluation

At the beginning of the fiscal year the Forest had 56,288 acres leased for oil and gas. Approximately 21,030 acres (about 37%) expired over the course of the year. The Forest processed five new lease parcels encompassing 4,366 acres in 1998, all of which were appealed to the Department of Interior's Interior Board of Land Appeals (IBLA) for NEPA, NFMA, and Endangered Species Act concerns. Three lease parcels totalling 2,231 acres were sold and the two other parcels did not receive any bids during the BLM's auctioning process. At the end of the year the Forest had approximately 39,241 acres under lease, representing approximately 4% of the available 954,300 acres made available under the ROD for the Oil and Gas EIS.

Leasable mineral activity has been low on the Forest. When it occurs it receives thorough analysis and monitoring. The Surface Operating Plan associated with the Lava Mountain APD was implemented in full compliance with the Standards and Guidelines in the Forest Plan. With the global depression in the price of oil the future interest in oil and gas leasing on the Forest is anticipated to be very low.

3. Common Variety Minerals

Six free use permits were processed and/or utilized in 1998, encompassing over 19,000 tons of material. These permits are issued primarily to state, local, and federal governmental agencies or municipalities such as Wyoming Department of Transportation or Fremont County.

Twenty-nine personal and commercial use permits were issued across the Forest for the removal of approximately 935 tons of rock.

Evaluation

Commercial interest in rock material, especially decorative rock, is increasing on the Wind River Ranger District. The residential development in Teton County and the Jackson Hole area is generating the demand. As the cost of building materials increases it is expected that there will be a growing demand for the use of the Forest as a source of rock and gravel material.

PROTECTION

1. Fuels Treatment Target

The fuel treatment program encompasses activity-generated fuel reduction and natural fuel reduction. Activity fuel reduction focuses on activities which generate wood debris such as logging, tree thinning, and road right-of-way wood debris. Natural fuel reduction focuses on vegetation exceeding natural volumes based on the assumption of natural disturbances and agreed-to thresholds. The Forest Plan Standards and Guidelines for activity-generated fuel provide direction to reduce or treat fuels so the potential fireline intensity will not exceed 400 BTU/sec/ft (4 ft flame length) on 90% of the normal fire season, or isolate continuous fuel

concentrations, or provide additional protection. Measurement frequency for natural and activity fuel treatment is the annual planned target of +/- 25%.

The following fuel treatment activities were accomplished in FY 98. The Forest had a target of 17 acres of activity fuel (BD) and 2,000 acres of natural fuel treatment. One hundred percent of the activity fuel target was completed and 100% of natural fuel treatment was completed. All activity fuel treatments satisfied the Forest Plan Standards and Guidelines.

Evaluation

The use of prescribed fire as a vegetation management tool is increasing on the Forest, along with greater emphasis on watershed, soil and air protection. Coordination between the use of prescribed fire and/or wildland fire and soil, water and air protection is critical.

As the use of prescribed fire increases, a review of the Forest Plan is suggested to ensure the appropriate level of soil, water, and air protection is occurring. A recommendation is to address this review as part of the Forest Plan revision.

2. Fire Management Effectiveness Index

Monitoring fire management effectiveness involves measuring the relative effectiveness of fire protection by comparing funds spent on suppression to resource loss. The model used to determine the best combination of firefighting resources to achieve the least resource loss is the National Fire Management Analysis System. Currently, a six year old analysis is used to evaluate fire management effectiveness. A new analysis is scheduled for 1999.

Terminology in the Forest Plan Standards and Guidelines, Fire Protection and Appendix F of the LRMP is not consistent with terminology adopted after the Federal Wildland Fire Management Policy & Program Review (1995) and the Wildland and Prescribed Interagency Fire Management Policy (1998).

The Absaroka-Beartooth Wilderness Fire Management Plan (1993) allows for prescribed natural fires on the portion of the wilderness within the Shoshone National Forest. Because the wilderness fire plan is not addressed in the LRMP it is unclear whether the wilderness fire management guidelines are incorporated into the LRMP.

Evaluation

It is recommended that old terminology be replaced with new terminology either through a Forest Plan amendment or through the revision process. As an example, "prescribed natural fire" has been replaced with "wildland fire use" and "control/contain/confine" no longer represents a type of management strategy.

A review of the Forest Plan is recommended to ensure the appropriate guidelines from the Absaroka-Beartooth Wilderness Fire Management Plan are incorporated into the LRMP.

The most efficient level of fire protection capabilities for the Forest based on the 1993 analysis is \$521,646 (1998 dollars). In 1998 the Forest received \$386,700 or 74% of the most efficient level of fire protection.

RANGE

1. Grazing Use

Grazing use is the amount of forage used by permitted commercial livestock on the Forest. It does not account for the amount of forage consumed by recreation visitor livestock.

Commercial Livestock: The Forest Plan listed the management practices (grazing in this case) and the proposed outputs for those practices in Chapter III (see table III-1, pages III-13 to III-14 for range projections). The Plan predicted an average annual output of 78 thousand animal unit months (AUM) for cattle and horse grazing and 25.4 thousand AUM for sheep and goats for the period of time between 1985 and 2000. Total Forest commercial livestock grazing was predicted to be 103.4 thousand AUM annually. A number of allotments (4 or 5) are no longer allocated for commercial livestock, hence the allocation for cattle and horses is 77.4 thousand AUM and for sheep is 20.3 thousand AUM, or a total of 97.7 thousand AUM.

Table 2 shows authorized commercial livestock use on the Forest for the last 13 years. Authorized non-use is defined as grazing use that has been offered but not taken by the permittee for personal reasons or for resource protection. Vacant allotments are available for grazing, but are not being grazed due to lack of demand from the livestock industry (mostly sheep) or because grazing permits have been waived back to the Forest Service and new permits have not yet been issued.

Evaluation

Grazing use since 1986 for cattle and horses has been below what the Forest Plan projected. Sheep grazing use has fluctuated since 1986 beginning with approximately 37,000 AUM in 1986 to a low of 13,000 AUM in 1995. Demand for sheep grazing has been down.

Table 2: Actual Available Commercial Livestock Grazing Use (1,000 AUM)

| Year | Cattle/Horse | % Plan | Sheep/Goat* | % Plan | Total | % Plan |
|--|--------------|--------|-------------|--------|-------|--------|
| Forest Plan | 77.4 | | 20.3 | | 97.7 | |
| 1986 | 54.6 | 71 | 3.5 | 17 | 58.1 | 60 |
| 1987 | 76 | 58.6 | 2.0 | 10 | 60.6 | 62 |
| 1988 | 56.4 | 73 | 2.3 | 11 | 58.7 | 60 |
| 1989 | 57.9 | 75 | 2.3 | 11 | 60.2 | 62 |
| 1990 | 64.3 | 83 | 2.3 | 11 | 66.6 | 68 |
| 1991 | 57.7 | 76 | 1.6 | 8 | 59.3 | 61 |
| 1992 | 49.1 | 63 | .9 | 5 | 50.0 | 51 |
| 1993 | 56.0 | 72 | 1.4 | 7 | 57.4 | 59 |
| 1994 | 53.6 | 69 | .4 | 2 | 54.0 | 55 |
| 1995 | 56.8 | 73 | .2 | 1 | 57.0 | 58 |
| 1996 | 56.8 | 73 | 1.3 | 7 | 58.1 | 59 |
| 1997 | 54.2 | 70 | 1.6 | 8 | 55.8 | 57 |
| 1998 | 58.2 | 75 | 1.4 | 7 | 59.6 | 61 |
| *AUMs in this column represent sheep grazing use. No commercial goat grazing is occurring on the Shoshone. | | | | | | |

2. Forage Utilization

Allowable forage utilization is determined by applying the allowable use guides in the Forest Plan to the grazing system being implemented on the ground. Most of the allotments on the Forest are managed under a modified deferred-rotation grazing system. Under this system, grazing is delayed or not scheduled on a given area or unit of the allotment during the active growing season to allow for plant reproduction, recovery, or establishment of new plants.

Evaluation

In 1998, utilization studies were completed on 40 allotments (listed below) or 49% of a total of 82 allotments grazed. In general, during the 1998 grazing season, forage utilization did not exceed acceptable standards in any one allotment. In some instances, utilization for specific areas within allotments did exceed acceptable standards. The level of utilization within these areas was not representative of the average utilization within the entire allotment and did not exceed acceptable standards by more than 10% on the allotment.

The Forest has established an ongoing monitoring program for permittees, with assistance from the University of Wyoming and the Agricultural Extension Service. As a result, permittee monitoring was performed on 18 of the following allotments (noted with an *): Bald Ridge, Basin*, Crandall, Table Mt., Ghost Creek, Lake Creek, Little Rock, Face of the Mountain*, Dick Creek*, Wood River, Kirwin, Timber Creek, Pickett Creek*, Piney Creek*, Meeteetse Creek, Table Mt./Hardpan, Wiggins Fork*, Horse Creek, DuNoir, Whiskey Mt*., Union Pass*, Dickinson Park*, Squaw Creek, Bayer Mountain*, Ed Young Basin*, Pine/Willow, Slate Creek, Sawmill*, Maxson Basin, Bear

Creek*, Wind River*, Warm Springs*, Fish Lake*, Salt Creek*, Meadow Creek, Middle Fork, Frye Lake, Ramshorn/Parque Creek, Hays Park* and South Pass.

3. Range Condition and Trend

Range analysis field exams were completed according to methods found in the Region 2, Rangeland Analysis and Management Training Guide. Field exams were conducted on all or portions of the following allotments: Ed Young Basin, Horse Creek, Hays Park, Bayer Mt., Sawmill, Dickinson Park, Union Pass, Warm Springs, Wind River, Fish Lake, Salt Creek, Wiggins Fork, Bear Creek, DuNoir, Whiskey Mt., Pine/Willow, Slate Creek, Middle Fork, Squaw Creek, Bald Ridge, Ghost Creek, Lake Creek, Basin Crandall, Table, Little Rock Creek, Face of the Mt., Piney Creek and Pickett Creek.

Data was collected using a variety of techniques including rereading permanent trend transects, taking photos at established points, establishment of condition/trend transects in "key areas," browse transects, and other approved methods.

Evaluation

Preliminary findings of the data collected in 1998 indicate that, except in a few problem areas, overall conditions are improving and resource conditions are moving toward the desired future condition. This positive trend can be attributed to improved management practices by permittees and to stocking levels which have been declining over the past several decades. Several areas of concern involve excessive utilization of winter range and browse by elk and moose. The Wyoming Game and Fish Department is aware of these situations and is attempting to make adjustments to control population numbers.

4. Allotment Management and Permittee Plans

The Shoshone National Forest is in the NEPA analysis process of permit issuance and allotment management plan (AMP) development for 31 grazing allotments. The associated Decision Notice is expected to be issued in late 1999 or early 2000. Allotments involved in this analysis process are: Bald Ridge, Bench, Crandall I, Crandall II, Face of the Mountain, Ghost Creek, Table Mountain, Bennett Creek Allotment Complex (including Deep Creek, Little Rock, Stockade, Deep Lake and Line Creek East), Burnt Mountain, Peat Beds, Big Creek, Dunn Creek, Trout Creek, Green Creek, Robbers Roost Allotment complex (including Logan Mountain, Pearson, Rattlesnake, Jim Mountain), DuNoir, Union Pass, Warm Springs, Wind River, Bayer Mountain, Ed Young Basin, Frye Lake, and Middle Fork.

The Forest Plan requires that allotment management plans and annual grazing instructions be reviewed and developed. The annual instructions specify the rotation schedule, number of livestock, the season of use and any other instructions or permit conditions that will assist in the management of the resource and implementation of Forest Plan standards.

Evaluation

In 1996, the Forest issued a decision authorizing term grazing permits on 33 allotments based on an Environmental Assessment published and reviewed by the public earlier that year. The Forest completed an environmental assessment on an additional 31 allotments during 1998. A decision has not yet been issued on these allotments, but this is expected to be done during FY 99. Analysis has thus been completed on 64 of the 77 open grazing allotments. Further work remains to be done on all allotments relative to heritage resources and compliance with the updated agreement between the Forest and the State

Historic Preservation Office. Under the 1995 Recission Bill, site-specific NEPA analysis and decisions for allotment management planning on all active grazing allotments must be completed by the year 2010. The Forest remains on a schedule that will meet this requirement.

5. Forage Development (Range Readiness)

Sufficient plant development helps ensure the long term health and vigor of the forage resource. The Forest Plan requires that 10% of active grazing allotments be checked annually to verify adequate forage development prior to livestock use.

Evaluation

Plant development on the following allotments was field checked in 1998 to confirm the "on date" (date that livestock is allowed on the allotment): Ed Young Basin, Horse Creek, Hays Park, Fish Lake, Salt Creek, Wiggins Fork, Bear Creek, Table, Little Rock Creek, Face of the Mt., Piney Creek and Timber Creek.

6. Noxious Weeds

The Forest completed NEPA analysis for the development of a plan to control noxious weeds and undesirable plants. The Decision Notice was issued in February, 1999 and the management plan will be developed prior to the 1999 field season. The selected alternative is an integrated management approach that includes improved livestock management, cooperative agreements with the local Weed and Pest Districts, participation in Weed Management Area boards, application of herbicides, and the introduction of biological controls where available.

Evaluation

In 1998, 400 acres were treated with herbicide and approximately 300 acres were impacted by biological control agents (insects) that have been introduced in prior years to help control noxious weeds.

RECREATION

In 1998, the emphasis for the front country recreation program on the Forest continued to be "having a strong field presence of highly qualified rangers" providing for health and safety of the Forest visitor, stewardship and protection of forest resources, and clean well-maintained facilities in addition to high quality services. A daily log for compliance and monitoring purposes was required of each field ranger during the field season.

Priorities were:

- To protect the health and safety of Forest visitors, and prevent human/bear conflicts. To protect the grizzly bear by providing high levels of information, education, interpretation, monitoring, and compliance relative to the grizzly bear.

- To keep all administrative sites and public recreation facilities safe, clean, and well-maintained.
- To perform adequate levels of monitoring, clean-up, and site rehabilitation in dispersed areas so that Forest visitors have a high quality experience.
- To provide adequate levels of compliance/enforcement patrols to assure users and resources are protected, and user conflicts minimized.
- To educate visitors on proper land ethics and multiple use, focusing on no-trace techniques and avoiding human/grizzly conflicts.
- To work as partners with resorts, the campground concessionaire, and outfitter naturalists to provide public safety, land stewardship, and high quality value-added visitor services (including education and interpretation).

Monitoring was integrated in all aspects of field work; in addition the Shoshone National Forest continued work on several nationwide Forest Service initiatives to help recreation managers better implement and monitor quality recreation experiences and facilities. Generally these initiatives involve establishing a database to record all developed and dispersed recreation sites, their conditions, visitor occupancy rates, and their costs of operation. The Meaningful Measures and Infrastructure databases are currently in place on the Forest and baseline data is being entered. An inventory of the recreation facilities' deferred maintenance backlog is being undertaken during the 1999 season.

1. Off Road Vehicle Use of Designated Travelways

Off-road vehicle (ORV) use on the Shoshone National Forest is restricted to travel on designated roads (signed with white arrows and/or Forest road numbers) and snowmobiles travelling on snow where permitted. Off-highway vehicle (OHV) use both nationally and on the Shoshone National Forest, is increasing. As a result of this use (legal and illegal), problems and user conflicts continue. A good share (50% on the South Zone) of violation notices issued in FY 98 related to off-road violations. Off-road use is monitored by Forest personnel whenever possible through observation and inspection while on patrol.

As noted in the 1997 Monitoring Report, several areas on the Forest are of particular concern. The areas of concern which were identified in the winter of 1997/98 were incorporated into the 1998 monitoring plan. Areas of concentrated monitoring for the 1998 use season are listed below, by district.

Evaluation

Washakie District:

The South Pass and Sinks Canyon Loop areas were monitored on a weekly basis throughout the summer by Forest personnel. Law enforcement patrols were made on a regular basis throughout the summer season. District personnel are having difficulty

responding to the overall level of OHV use on the district, and increasing public pressure for more ORV trails.

Wind River District:

Monitoring by Forest Service law enforcement personnel indicates that the increasing use trend in the Union Pass area continues.

Wapiti District:

Forest personnel on the Wapiti District monitored OHV use through visual observation, photography, violation notices, and incident reports. Information gathered in the field was entered into a daily journal and new roads were mapped.

Clarks Forks District:

Problem areas (the Morrison Jeep Trail, Fantan, and the Lily Lake trails) were patrolled twice weekly via ATVs focusing on off-road violations, resource damage (primarily from camping), and violation of the bear orders. Roads and dispersed areas associated with roads in the following areas were monitored daily: Bald Ridge, upper Sunlight, Clay Butte, Upper Morrison Jeep Trail, Fantan, Crazy Creek, Pilot Creek, Russell Creek, Antelope Butte, and Muddy Creek. Each of these areas was monitored throughout the summer by visual observation. Patrols were documented and violations and incidents were recorded.

Monitoring continues to indicate an overall increase in OHV use on the Clarks Fork District. Of particular, note as in previous years, was the Bald Ridge area where over 60 vehicles a day are common during hunting season. The Morrison Jeep trail and the Upper Sunlight area are also experiencing an increase in OHV use, particularly among ATV users.

Table 3 summarizes off-road usage concerns.

Table 3. Off-Road Usage Summary.

| Road System | Concerns | Remedies/Actions |
|---|---|--|
| Clocktower | Off-road travel is causing resource damage. | Signage and gating appear to be effective. Monitoring to prevent rutting will need to continue |
| Elk Fork | Increasing resource damage from vehical traffice during wet conditions. Most damage occurs during hunting season. | Road monitoring during hunting needs to increase. Road restrictions may have to be implemented. |
| North Fork side roads | Off-road use is increasing and causing resource damage and the creation of nonsystem roads. | Closure during N Fork Highway reconstruction has helped. Signage and barriers and patrols are working. |
| Kitty Creek | Off-road use is increasing, especially in previous harvest areas. Intrusion into wilderness is occurring. | Road is planned for permanent closure in 1999. |
| Blackwater | Vehicles are creating new by-ways, particulary in wet areas. | Gating and rehabilitation has helped situation. Continue monitoring. |
| Sweetwater | Minimal off-road use is occurring. Potential for damage is low. | Continue monitoring to deal with any damage |
| Logan Mountain | Vehicle use past signage and gate continues. Gates are being destroyed. | Gates and signs have been repaired. Patrols will increase. |
| Rattlesnake Mountain (Monument Hill) | Public access has been restricted by private landowners. | Access for the public is being negotiated between county and private landowners |
| Ishawooa Creek | ATV use past Mariposa Ranch/USFS gates is causing new pathways. | Regular Patrols will increase. |
| Aldrich Creek Outfitter Corral Access | No problems with off-road use. | |
| Aldrich Creek Access | Illegal roads continue to be used. Ruts and resource damage are occurring. | Signage and white arrow program reintroduction will aid enforcement. |
| Schoolhouse Creek | Some travel beyond road end is occurring. No resource damage yet. | Sturdier signage will be installed. |
| Carter Mountain Road | Recent assessment indicates wide-spread off-road use continues, primarily by ATVs | Reintroduction of white arrow signage and increased patrols will happen in 1999. |
| Bald Ridge/ Upper Sunlight Russel Creek/ Clarks Fork Canyon Table Mounain /Crazy Lake Trail Clay Butte-Absaroka Beartook Wilderness | Motorized off-road use is causing some resource damage in these areas. | Daily patrols monitor usage. Comliance patrols checking for OHV use and resource damage. |
| Fantan/Morrison Jeep Trails Lily Lake trail | OHV use is increasing, particulary during hunting season. | Compliance patrols have increased. OHV use will be monitored. |
| Phelps and Kirwin areas | OHV/ATV use is increasing | |

2. Trail Condition

Summer/Fall Use Trails

The 1998 trails budget continued to be above historical averages. Maintenance coverage was relatively high, and the overall trail system on the Forest was maintained to a high safety standard. Maintenance priorities continue to be based upon public safety and resource concerns.

Trail condition is monitored annually on the Shoshone National Forest. In 1996 the Forest implemented a formal Forest-wide trails monitoring program. The monitoring goal for all districts was 100% of all mainline trails during the season. In addition to the mainline trails, a sample of 50% of all secondary trails was to be monitored and the results documented. All monitoring data is kept on file within each of the district offices. There are 1,459 miles of trails on the Shoshone. Motorized use is allowed on approximately 460 of these miles. In 1998, all mainline trails and the majority of secondaries were maintained and monitored. In addition, a portion of the ways (or undeveloped trails) was monitored.

Evaluation

Meeting public expectations for acceptable levels of trail maintenance continues to be a problem for the Shoshone National Forest. Although many areas still need maintenance, there are many miles of trail at an acceptable standard considering the type of use, the amount of use, and the management objective(s) for the specific area (i.e. primitive wilderness vs. nature interpretation adjacent to a campground). Many trails are located in terrain that limits the ability to achieve handbook standards, and management objectives on wilderness trails mandate a lower standard (and therefore higher risk and challenge) than that usually specified as a general standard in handbooks.

Sections of mainline and secondary system trails that are impassable receive first priority; sections that present hazards with unacceptable safety risks (based upon the land management objectives and the experienced user concept) are the second priority; and the sections of trail that are contributing to resource degradation are the third priority. Trail crew flexibility allows the highest priority work to be completed throughout the season. Funding levels, though higher than in past years, do not allow the Forest the luxury of considering convenience of the user as a criteria for trail maintenance.

Overall use of trails is increasing along with an increase in varieties of use. In addition to hikers, backpackers, and horses, use on some parts of the Forest includes mountain bikes, wheelchairs, runners, llamas, and goats. Llamas and goats are used on both wilderness and non-wilderness trails. Each of these activities is accompanied by a separate set of maintenance challenges. Use of motorized vehicles on trails (where such use is allowed) is expanding rapidly, especially summer use of four-wheelers in the Dubois area and the Morrison Jeep Trail in the Beartooths.

On nonmotorized trails on the Forest's North Zone, horses are the predominant use except in the Beartooth area where backpacking is the primary use. Use on the North Zone has been fairly static due to late snow/high water and probably the increasing presence of grizzly bears.

Due to the extreme type of terrain present in many areas (slick rock, cliffs, boulder fields, and talus slopes), and the annual problems associated with high water, it is impossible to eliminate all the major safety hazards using only primitive skills technology. Motorized rock drill authorization was received this year for the Eagle Creek project, and will be necessary in many situations involving rock work if trails are to be maintained to an acceptable standard.

The majority of safety hazards for both humans and livestock are related to rock hazards on steep side slopes. Excessive grade and poor alignment with inadequate drainage continue to cause the most resource damage.

Trail condition for the 1998 use season as reported by district is:

Wind River District

Wilderness rangers and trail crew staff monitored 100% of the mainline trails on the Wind River District. Monitoring forms and photos were used to record the findings of the field crews.

In 1998, a Sierra Club volunteer group repaired significant damage to the Jade Lake Trail, and four wilderness rangers cleared most of the mainline trails of downed timber. A significant 10 day reconstruction project was completed in 1998 with a 10 person crew on the Glacier Trail. Many areas of trail braiding are getting worse and will continue to deteriorate without significant attention. Lack of regular maintenance over the last 40 years has lead to significant erosion of tread material. Many small bridges and rock structures need replacing.

Washakie District

One hundred percent of the mainline trails and 90% of the secondary trails were monitored on the district in 1998. Trail monitoring reports and photo documentation of problem areas were recorded for each trail segment that had not been documented before. No monitoring of way trails took place due to limited staffing and the low amount of visitor use on these trails.

The district's Trail Project Needs Inventory contains about 40 trail project descriptions. Monitoring in 1998 shows that almost all of these projects still need to be completed. A Sierra Club group worked on one heavily impacted area on the Bear's Ears Trail. Budget and staffing levels do not permit the level of attention required to complete the identified trail maintenance.

Greybull District

Trail maintenance on the Greybull District is performed by a three-person trail crew. The crew performs trail maintenance and monitoring, campsite clean-up and monitoring, and provides information and education to the public. The crew also monitors user compliance. Trails receive routine maintenance to allow passage and to provide health and safety. Maintenance on the district in 1998 included clearing fallen trees, removing rock slides, and repairing and/or removing safety hazards from trailways.

The district hosted a Sierra Club service trip. Their project was maintenance of trails radiating out from the Kirwin area.

Wapiti District

Trail condition monitoring on the Wapiti District was recorded on trail monitoring forms and photographs. Trails were monitored for resource damage and safety hazards.

Monitoring indicates that the majority of the mainline and secondary trails on the Wapiti District are meeting the management objectives for health and safety. Overall, mainline trails are maintained to a Level II standard for wilderness objectives. Most secondaries are maintained to Level I, with high hazard areas repaired. Way trails are being monitored as to condition and use, with no active maintenance (incidental only when impassable if and when encountered) at the present time.

Many of the trails on the district have reached a maintenance plateau. Trail crews are able, for the most part, to keep them open and maintained to their current level. In most areas this level meets management objectives. Not much more can be done to maintain these trails without major reconstruction. One of the major challenges on the district is the instability of the Absaroka volcanics - any significant rainfall causes slides and blowouts. Many trails become unserviceable due to storms, and have to be worked several times just to keep them open. As an example, trail crews were sent to work the Deer Creek trail 3 times this summer just to keep it open, each time just days after it had been maintained.

Two and a half miles of the Eagle Creek trail were realigned/reconstructed during 1998, eliminating highly hazardous conditions in three areas, and rerouting the trail out of the bottom for watershed protection. The Backcountry Horsemen teamed up to support an Eagle Scout Project and packed in and installed a 60 foot puncheon bridge across a major bog in the Trout Creek area.

Clarks Fork District

Trail crews on the Clarks Fork District maintained and monitored 40.5 miles (100%) of mainline trails, 162.4 miles (98%) of secondary trails, and monitored 26 miles (42%) of way trails. Field data was recorded on trail monitoring forms and photographs.

The major deferred maintenance backlog appears to be in the Beartooth area, and will be a priority for both condition surveys and maintenance during the 1999 season.

Winter Use Trails

The Shoshone National Forest is experiencing increased winter use. Winter trail use is monitored annually and trails are groomed and maintained in cooperation with other agencies or user groups.

Snowmobile trails in the Clarks Fork area are groomed through a cooperative agreement with the Park County Snowmobile Association and the Wyoming Division of State Parks. Copies of the trail maintenance logs are reviewed by Forest recreation staff and maintenance

inspection is done by state park personnel. Two trail counters are placed annually by the State of Wyoming, one at Pilot Creek and one at Lake Creek, which are used to monitor use trends. Cooperative efforts with the State and local snowmobile clubs allow installation of trail markers, wilderness boundary signing, and monitoring of all marked trails during the winter months. Monitoring indicates increasing use, and has also identified some curtailment of snowmobile intrusions into the Absaroka Beartooth Wilderness.

The Greybull District has the Wood River Cross Country Ski Area, administered by the Meeteetse Recreation District. Trails are groomed and an overnight cabin is provided for skiers who wish to stay overnight. When conditions are favorable, this is a very popular area for people from the Big Horn Basin as well as the Billings, Montana area. The Meeteetse Recreation District printed a new brochure of the area in 1998.

The South Zone of the Shoshone - Wind River and Washakie Districts - contains close to 200 miles of snowmobile system trails that connect with the system trails on the Pinedale, Jackson, and Buffalo Districts of the Bridger-Teton National Forest. The South Zone contains a portion of the Continental Divide Snowmobile Trail (CDST), a designated winter recreational trail. These trails are inspected annually by personnel of the Forest, local snowmobile organizations, and the Wyoming Department of Commerce for personal safety, trail reroutes, and additional signs. The Department of Commerce funds the grooming of trails and the Forest, together with local volunteer groups, signs and stakes the trails.

Twenty-five new infrared trail counters were purchased in FY 98 by the Wyoming Department of Commerce and the USFS for the Shoshone & Bridger-Teton areas to begin a formal use/trail condition monitoring system. The new program will be implemented during the 1998-99 winter season. Forest personnel also monitor use and facility condition through periodic inspection and feedback from users.

The CDST is monitored annually through the CDST Monitoring Plan which was developed in partnership with several environmental groups who were concerned about future impacts of the trail on other resource values. The plan includes monitoring of use, and impacts to vegetation, soil, water, air and wildlife. Each year the state of Wyoming compiles and prepares a season report based on the data collected by all the agencies involved with the trail. The CDST is used in localized areas, but has not received extensive use over its entire length.

Evaluation

With the reconstruction of the Forest's highways (North Fork, Chief Joseph, Beartooth, Togwotee Pass, and the Loop Road), many of the safety and parking concerns relative to winter use have been and will continue to be addressed in a positive manner.

The Shoshone National Forest has been represented on an interagency team charged with evaluating winter visitor use in the Greater Yellowstone Area. The team was chartered by the Greater Yellowstone Coordinating Committee (GYCC) in response to greatly elevated levels of snowmobile use in Yellowstone National Park, and a number of other issues that are, or could potentially, affect the six national forests and two national parks represented. The team performed an assessment of the current winter use conflicts that are occurring in the GYA. Issues include crowding, safety, air quality, wildlife impacts, community

expectations, wilderness trespass, adequacy of facilities, and conflicts between different user groups. The preliminary report on winter use was published in April of 1997. The final report remains unpublished as of this time, having undergone intensive scrutiny by partners in State government (Idaho, Montana and Wyoming) over a period of time. The final document is expected to go to the publisher in April of 1999.

The work done in the assessment deserves continued attention in this report because of the ongoing issues associated with winter use by various segments of the public. Use is increasing in some places on the Shoshone National Forest; some conflict areas are being aggravated. The National Park Service (Yellowstone and Grand Teton) are engaged in preparing an EIS evaluating winter use as the result of a lawsuit settlement. The Forest Service is a cooperating agency in that effort, and the Shoshone Forest Supervisor represents the agency directly. We expect to analyze and document potential effects on the GYA forests, including the Shoshone, from a variety of alternatives for winter park management. The national forests are under a similar shadow for possible lawsuits on our winter programs. At the same time, Wyoming State Parks and Recreation personnel are requesting they be allowed to widen trails in order to accommodate trail-grooming machines and faster and greater amounts of snowmobile traffic more safely. The need for continued monitoring of winter recreation use and visitors' perceptions (social/economic) is indicated to prepare for the Plan revision effort.

3. Dispersed Recreation Use and Experience and 4. Dispersed Campsite Condition

In 1998, approximately 75% of dispersed sites on the north end of the Forest were monitored. Dispersed sites along roads were monitored more frequently than backcountry sites. Again the intent was to monitor a similar percentage of sites during the 1998 field season on the South Zone of the Forest (Washakie and Wind River Districts). However, due to many factors only a small percentage of total sites were formally monitored. During the winter months South Zone employees located groups of dispersed sites on maps in order to get a better idea of where clusters of dispersed camping areas are located. These areas were captured in a Geographical Information System (GIS). This data will be used in FY 99 to help South Zone personnel prioritize dispersed campsite inventories and more efficiently monitor dispersed sites.

Evaluation

Past monitoring indicates dispersed areas needing attention, and in 1998, the following were priorities on the Clarks Fork. The Morrison Jeep Trail was patrolled twice weekly via ATVs focusing on off-road violations, resource damage (primarily from camping), and violation of the bear orders. Dispersed areas associated with roads in the following areas were monitored daily: Bald Ridge, upper Sunlight, Beartooths, Upper Morrison Jeep Trail, Fantan, Crazy Creek, Pilot Creek, Russell Creek, Antelope Butte, and Muddy Creek.

Within the North Fork of the Shoshone River corridor on the Wapiti District, resource degradation and littering from dispersed camping is minimal. Dispersed camping is not allowed within 1/2 mile of the highway. Consistent enforcement of the special order prohibiting this has virtually eliminated any problem dispersed areas on the corridor. Table 4 summarizes dispersed recreation use on the Forest.

Table 4. Dispersed Recreation Use Summary.

| Area | Status | Remedies/Actions |
|---|--|--|
| Lower Sweetwater Road | Few sites exist. | Existing site location is permitted. |
| Lower Kitty Creek Road | Little or no use has occurred in this area | Monitoring will continue. |
| Blackwater Creek Road | Minimal use except at road's end. | Sites cleaned and rehabilitated |
| Elk Fork Creek Road | Hunting season use is heavy. | Sites are being used responsibly, monitoring will continue |
| Clocktower Creek Road | Road closure gate is installed. Use below gate has been limited due to N Fork reconstruction. | N Fork reconstruction alignment may prevent future use. |
| Aldrich Creek Road | Few sites with no damage. | No actions necessary. |
| Carter Mountain Road | Several sites have been rehabilitated and has appeared to discourage heavy use. | Continue monitoring and rehabilitate as necessary. |
| Clearwater Creek Spur Road | N Fork Highway reconstruction has eliminated use. | No actions necessary. |
| June Creek Road | Several sites were rehabilitated due to their close proximity to the highway. | Reconstruction/realignment will eliminate use in this area |
| Mummy Pit Area | Sites have been rehabilitated and use has not recurred. | Rex Hale campground will use this area |
| Misc. North Fork Corridor Sites | Sites near Clearwater and Mummy Pit were rehabilitated. | Sites were cleaned and area posted. Monitoring to continue. |
| Deer Creek | Heavy use just up the drainage. | Sites were cleaned several times during the season. Rehabilitation, signage and visitor contact will continue. |
| Brooks Lake Wiggins Fork Road Double Cabin Road Union Pass | Heavy use is occurring | New monitoring technique and form has been implemented. |
| Louis Lake Basin | Dispersed use is increasing | Dispersed use management needs to increase and be coordinated with other agencies. |
| Sinks Canyon | Overflow parking conditions are increasing. | Joint BLM, USFS and volunteer trail construction has reduced resource damage potential. |
| South Fork Shoshone | Ice climbing use is increasing. Education about bighorn sheep has helped with responsible use. | Monitoring and climber education will continue. |
| Wild Iris Climbing area | Use is increasing. | Toilets have been installed. Monitoring will continue. |

The Greybull District was involved in a national recreation use pilot survey. The district was broken up into areas by "roaded dispersed" and "unroaded dispersed." These sites were randomly surveyed beginning in June 97 through June 98. Survey data was collected and submitted to a receiving center which is compiling and analyzing information at the National level.

Compliance was again a priority throughout the Forest. The majority of citations given were for violation of the grizzly bear food storage order (see *Compliance with Grizzly*

Guidelines section under *Threatened, Endangered and Sensitive Species*). Signing on the districts has been kept current and up to date. Visitors at the trailheads and campgrounds received information and education from Forest personnel. Every effort was made to keep users informed of the orders and the situation with the grizzly bears.

5. Developed Site Use

Developed recreation site use is monitored largely through user fees and observation. More reliable use data is available for sites where fees are collected. Where user fees are not collected, district recreation personnel keep track of use in a number of ways including car counts at trailheads, visual estimates, and sign-in sheets.

Another major effort being undertaken in 1999 relates to deferred maintenance. A complete inventory and condition assessment of recreation facilities, as well as costs to bring facilities up to standard, are occurring over a five year period.

Evaluation

In the past few years region-wide standards (USFS Rocky Mountain Region) for maintaining recreation facilities were developed and prioritized. Implementation of the Meaningful Measures system began in 1998 and will continue into 1999. This process is expected to help the Forest better define the quality of use it provides in addition to the amount. Measures used to monitor developed recreation site use will be consistent throughout the National Forest system.

6. Developed Site Condition

Facilities are maintained to the extent that funding levels allow. In recent years the level of funding has made it very difficult to keep up with both operation and maintenance of developed sites and future funding is not expected to increase. Rocky Mountain Recreation, a concessionaire, operated developed campgrounds in 1998.

Evaluation

On the Clarks Fork District, eight campgrounds (110 campsites) were again managed by the Rocky Mountain Recreation Company. Management operations and facilities were inspected three times per week. Four formal inspections of concessionaire operations were also performed. Complete facilities inspections were made at the end of the operating season.

In 1998 the district installed new fire rings at Dead Indian Campground, new fire rings and tables at eight Lily Lake campsites, upgraded roads and spurs in some areas, and partially completed two new parking areas/trailheads at Island Lake and Morrison. Construction of the two trailheads will be completed in July of 1999. Use of these two new trailheads will eliminate many of the resource problems and user conflicts now occurring. Many facilities were stained or painted in 1998. With limited budgets, maintenance levels at developed recreation sites are generally routine and the heavy maintenance backlog is extremely high.

Developed sites on the Wapiti District receive heavy use from June through mid-September. Campgrounds on the North Fork of the Shoshone River corridor were operated by Rocky Mountain Recreation Company again in 1998. Monitoring of site condition occurred almost daily and was recorded in daily logs and on-site inspection forms.

As mentioned in the 1997 Monitoring and Evaluation Report, monitoring indicates that in general, campground facilities are clean and well-maintained. The primary problem noted by Forest personnel is the degradation of these facilities through daily wear and tear. Most of the picnic tables, hand pumps, fire rings and toilets have been in place since the 1960s and need to be replaced. All hand pumps had the internal workings replaced in 1997. Despite the heavy use these sites receive, soil and vegetation condition is generally good.

All campground facilities in the North Fork corridor are planned for upgrading and retrofitting during the next decade, starting with Three Mile Campground in 1999.

This year the Greybull District completed replacement of 100% of toilets in its high use areas. The condition of developed sites is generally good. District personnel and the North Zone fire crew removed hazard trees. Although toilets in the campgrounds are handicapped accessible, conditions of the roads and campsites make it difficult to access the toilets unless someone is driven to within approximately ten feet of the toilet.

The campground facilities on the southern half of the Forest are in poorer condition than those on the northern half. The Louis Lake campground, for example, continues to receive heavy use and subsequent resource impacts to the campsites and surrounding area. Major rehabilitation and/or reconstruction is needed. The water system in the Sinks Canyon campground requires constant maintenance. In 1998, seven breakdowns occurred. Additional capital investment funds are needed to upgrade these facilities.

7. Downhill Skiing Use

Sleeping Giant Resort provides the primary downhill skiing opportunity on the Shoshone National Forest. The resort is located on the North Fork corridor of the Wapiti Ranger District, and can accommodate approximately 1000 skiers per day.

The season for Sleeping Giant Resort typically begins in late December when the area opens for the Christmas holiday season. From January through March the area operates three days a week, Friday through Sunday. Local students represent a high percentage of the users at the Resort, and the area accommodates this use by opening during school vacations. Use at the area drops off significantly after the end of March, and the area closes in early April.

Table 5 summarizes use at the resort over the past five years.

Table 5. Sleeping Giant Resort Skier Days, 1993/94 - 1997/98.

| Season | December | January | February | March | April | Total |
|--------|----------|---------|----------|-------|-------|-------|
| 93/94 | | 376 | 1,409 | 900 | | 2,685 |
| 94/95 | 1,124 | 1,178 | 1,036 | | | 3,338 |
| 95/96 | 964 | 1,679 | 1,280 | 1,241 | | 5,154 |
| 96/97 | 1,002 | 1,313 | 1,295 | 830 | 88 | 4,528 |
| 97/98 | 366 | 1,243 | 1,020 | 697 | 64 | 3,390 |

Downhill Skier use at the Sleeping Giant Resort was down in FY 98 by approximately 25% from the previous year. At least a portion of this decline is attributable to mechanical difficulties which resulted in one or both lifts out of operation during a portion of the Christmas holidays when usage at the resort is typically high.

The Red Lodge Race Camp on the Clarks Fork District offers a summer program for ski race training. Four week-long sessions run from early June through early July, providing a training opportunity in the summer season for ski racers.

Reevaluation of ski area development is recommended by the Forest Plan when use exceeds managed capacity for three years. Current figures of use at the Sleeping Giant Resort demonstrate that usage remains well below capacity at this time.

THREATENED AND ENDANGERED SPECIES

1. Grizzly Bear Mortalities

The 1993 Grizzly Bear Recovery Plan established a number of parameters to be monitored for determining recovery within the Greater Yellowstone Area (GYA). Criteria for recovery include a limit on grizzly bear mortalities that applies to all jurisdictions within the GYA. Known human-caused mortality is not to exceed four percent of the minimum population estimate calculated on a six-year running average. In addition, female mortality (six-year running average) is not to exceed 30 percent of the four percent. Methods for estimating populations and calculating mortality limits are documented in the recovery plan. Because all recovery information reported by the Interagency Grizzly Bear Committee (IGBC) is summarized by calendar year, mortality information will be presented as such.

Evaluation

Though grizzly bear mortalities had been on a downward trend, they began to increase in 1994 (Table 6). Both 1994 and 1995 were poor food years for the bear and resulted in an increase in the number of human/bear conflicts and subsequent habituation, management removal, and mortality of bears. Five of the nine mortalities in the GYA in 1996 (management removals) were bears with a previous history of conflicts with humans or livestock, possibly precipitated during previous poor food years. One of the 1996 mortalities was a bear killed by a vehicle on a highway and the other three were hunter related, including the single mortality on the Shoshone National Forest. All nine of the human-caused mortalities in the GYA that counted towards annual recovery quotas in 1997 and 1998 were hunter related.

Hunter related mortalities are one of the most significant issues facing grizzly bear recovery in the GYA. As such, considerable time, effort and money are spent on hunter information and education, bear mortality prevention patrols, and enforcement of food storage orders to minimize human/bear encounters during the hunting season. Efforts to educate hunters and outfitters were increased on the Shoshone in 1996 because of the three hunter related mortalities that occurred on the Forest in 1995. These efforts were continued in 1997 and 1998. This and the fact that 1996 through 1998 were generally good natural food years were probably factors in the absence of human caused mortalities on the Shoshone in the last two years. The Forest will continue to be diligent in this effort and look for new or more effective ways to educate hunters.

One bear died in 1997 and one in 1998 on the Shoshone National Forest of unknown causes and both incidents are currently under investigation. Grizzly bear mortalities in the GYA in 1998 were the lowest recorded since 1991. Both total and female mortality six-year averages for 1998 were below the mortality threshold. Thresholds were exceeded for all bears in 1995 and female bears 1995-1997 (Table 6).

Table 6. Known Human-Caused Mortalities in the Greater Yellowstone Area and on the Shoshone National Forest (SNF) and Grizzly Bear Recovery Plan Thresholds, 1987-1998.¹

| YEAR | ANNUAL TOTAL MORT (SNF) | TOTAL FEMALE MORT (SNF) | TOTAL MORT LIMIT | TOTAL MORT 6-YR AVG | FEMALE MORT LIMIT | FEMALE MORT 6-YR AVG |
|------|-------------------------|-------------------------|------------------|---------------------|-------------------|----------------------|
| 1987 | 3 (0) | 2 (0) | | | | |
| 1988 | 5 (1) | 3 (0) | | | | |
| 1989 | 1 (0) | 0 (0) | | | | |
| 1990 | 9 (3) | 6 (2) | | | | |
| 1991 | 0 (0) | 0 (0) | | | | |
| 1992 | 1 (0) | 1 (0) | 10.37 | 3.83 | 3.11 | 2.0 |
| 1993 | 3 (2) | 2 (1) | 9.93 | 3.83 | 2.98 | 2.0 |
| 1994 | 10 (2) | 3 (0) | 8.74 | 4.83 | 2.62 | 2.17 |
| 1995 | 17 (5) ² | 7 (3) ² | 7.11 | 7.33* | 2.13 | 3.33* |
| 1996 | 9(1) | 4 (0) | 8.89 | 7.33 | 2.67 | 3.00* |
| 1997 | 8 (0) ³ | 4 (0) | 10.67 | 8.67 | 3.20 | 3.67* |
| 1998 | 1 (0) ⁴ | 1 (0) | 13.63 | 8.17 | 4.09 | 3.67 |

* Exceeded Grizzly Bear Recovery Plan Mortality Thresholds

¹ Only mortalities that are known human-caused and occur within 10 miles of the Grizzly Bear Recovery Zone are counted and used to determine whether or not recovery plan thresholds have been met. All mortalities are tracked by the Interagency Grizzly Bear Study Team.

² 1 female included in these totals for the SNF was captured and removed from the ecosystem in Montana. Mortality was attributed to SNF where the original management action (capture and relocation) occurred. Mortalities are not tracked to original management action prior to 1995.

³ A subadult male grizzly was discovered on Breteche Creek on the SNF in the spring of 1998 that died of unknown causes in 1997. This mortality is still being investigated and could be added to the human-caused mortality statistics for the SNF depending on the outcome of the investigation.

⁴ The death of one cub from unknown causes on Icy Creek on the SNF in November is not included and is still under investigation. Two additional human-caused mortalities occurred more than 10 miles outside the recovery zone. Thus only the one human-caused grizzly bear mortality counts towards the annual recovery quotas during 1998.

2. Compliance with Grizzly Guidelines

The key components of the Grizzly Guidelines are to 1) to maintain and improve habitat and, 2) minimize grizzly-human conflict potential. Compliance with Grizzly Guidelines is incorporated into the Shoshone National Forest’s annual program of work. It is required that all activities authorized, funded, or carried out be reviewed to determine those that may affect this and other listed species. This review is generally done as part of a biological evaluation process which includes an examination of potential cumulative effects. Consultation as

appropriate is carried out with the U.S. Fish and Wildlife Service as well as the Wyoming Game and Fish Department. Mitigation measures are incorporated where necessary.

A Special Order requiring that all attractants be kept unavailable to bears is applicable on most areas of the Forest used by grizzly bears. The Forest actively enforces compliance with this order and encourages attractant storage in all other areas of the Forest not covered by the special order. All incidents between grizzly bears and humans or livestock are recorded and monitored annually in cooperation with the Wyoming Game and Fish Department. Efforts are focused on eliminating the cause of the conflicts. All grizzly bear-human conflicts, confrontations, and management actions for the entire Yellowstone Ecosystem have been published annually since 1993. Beginning in 1998 this report will be incorporated into the annual Report of the Interagency Grizzly Bear Study Team. The report includes recommended actions to reduce conflicts.

Conflicts are defined as incidents in which bears injured people, damaged property, killed or injured livestock, damaged beehives, obtained anthropogenic foods, or damaged or obtained garden and orchard fruits and vegetables. Confrontations are incidents in which bears bluff charged, approached, or acted aggressively towards people; entered occupied backcountry camps; or frequented areas immediately adjacent to occupied homes, cabins, lodges or other human developments. Management actions are defined as incidents in which bears involved in bear-human conflict or confrontation situations are captured and marked, translocated, aversively conditioned, or removed from the population.

Evaluation

Eleven biological evaluation documents were written in 1998 as a part of the overall ongoing effort to comply with the Endangered Species Act and Regulations, and to help promote recovery and ultimate delisting of this species. Forest biologists and other personnel regularly meet with biologists and representatives from other involved federal and state agencies to review proposed actions and activities and consider potential remedial actions. Grizzly bear clauses, as identified in the Guidelines, were included and updated where appropriate in all special use permits, grazing permits, and contracts, issued for activities in grizzly bear habitat on the Forest.

Efforts to minimize grizzly-human conflicts are given the highest priority. Public education is paramount to the continued success of grizzly bear recovery. The Forest disseminates considerable information concerning areas of high seasonal bear activity, identification, behavior, foods, and measures to prevent or minimize grizzly-human conflicts. Information is made available at Forest offices, trailheads and campgrounds, the Wapiti Information Center, Clay Butte Information Center, included in mailings to potential visitors and hunters and distributed by Forest personnel through personal contacts with Forest users. The Forest participates in annual 'Living in Bear Country Workshops' conducted throughout Wyoming. Workshops were held in Powell and Lander in 1998.

Table 7. Grizzly Bear - Human Conflicts, Confrontations and Management Actions on the Shoshone National Forest, 1998.

| DATE | LOCATION | SPECIFICS | TYPE |
|-------------|--------------------------------|---|----------------------------|
| 7/16 | Blind Creek | Horn hunters bluff charged by adult female grizzly with a 2-year old cub. | Confrontation |
| 7/21 | Wood River | 2 subadult grizzlies entered camp and obtained food reward from panniers. | Conflict - Food Reward |
| 7/22 | Crandall Creek | Grizzly entered occupied camp. | Confrontation |
| 7/27 | Wood River | Adult black Angus bull injured by grizzly. Bull had to be destroyed. | Livestock |
| 8/4 | East Fork Twin Creek | Grizzly killed an adult cow. | Livestock |
| 8/11 | West Fork Twin Creek | Grizzly killed calf. | Livestock |
| 8/13 | Dunoir River | Adult male grizzly entered camp and received human food reward | Conflict - Food Reward |
| 8/16 | Upper Jade Creek | Grizzly entered camp and obtained small food reward. | Conflict - Food Reward |
| 8/28 | Brent Creek | Grizzly killed adult cow and calf. | Livestock |
| 8/28 | Brooks Lake Creek | Grizzly approached 5 people on horses. Bear could not be persuaded to leave area. | Confrontation - Aggressive |
| 9/3 | North Fork Shoshone River | Adult female grizzly bluff charged a hunter 3 times - hunter surrendered sheep carcass. | Confrontation - Hunter |
| 9/4 | Dunoir River | Grizzly killed cow. | Livestock |
| 9/9 | Wind River - Snowshoe drainage | Two hunters knocked down by grizzly. No injuries. | Confrontation - Hunter |
| 9/13 | North Fork Shoshone River | Hunter bluffed charged by adult female grizzly with 2 yearlings. | Confrontation - Hunter |
| 9/21 | Dick Creek | Grizzly bear killed 2 calves. | Livestock |
| 10/1 | South Fork Shoshone River | Two hunters attacked and injured by adult female grizzly with 2 cubs. | Conflict - Injury/Hunter |
| 10/2 | North Fork Shoshone River | Grizzly claimed an elk shot by a hunter. Bear bluff charged hunter. | Confrontation - Hunter |
| 10/3 | East Fork Wind River | Bear consumed 3/4 of hunter killed elk carcass. | Confrontation - Hunter |
| 10/7 | East Fork Wind River | Bear in campground at trailhead 3 times during the evening. | Confrontation |
| 10/7 | Dunoir River | 2 hunters went up tree when grizzly approached them. | Confrontation - Hunter |
| 10/8 | Bear Basin | Bear claimed 1/2 of a hunter-killed elk carcass. | Confrontation - Hunter |
| 10/17 | Little Jack Creek | Grizzly aggressively defending hunter-killed elk carcass. | Confrontation - Hunter |
| 10/20 | Piney Creek Drainage | Grizzly aggressively defending hunter-killed elk carcass. | Confrontation - Hunter |
| 10/21 | Little Jack Creek | Hunter bluff charged while on horse. | Confrontation - Hunter |
| 10/28 | Wind River | Bear aggressively defending hunter-killed elk carcass. | Confrontation - Hunter |
| 11/3 | East Fork Wind River | Hunter lost elk to grizzly. | Confrontation - Hunter |

A total of 26 incidents of grizzly bear/human or grizzly bear/livestock interactions were documented on the Shoshone National Forest in 1998. Four incidents were classified as conflicts, three of which resulted in human food rewards, and one case of human injury (elk hunters). There were six cases of livestock depredation and 16 grizzly/human

confrontations, 12 of which were hunter related (Table 7). The majority of the grizzly bear-human incidents on the Forest in 1998 were hunter-related. Most of the confrontations were related to bears claiming elk carcasses. The Forest emphasizes hunter education and compliance with the special food storage order during hunting season. The good news is that only one of the incidents resulted in human injury; there were no management actions and no dead bears.

North Fork Shoshone River Corridor Information

The following information is focused on the North Fork Shoshone River Highway corridor which runs between the town of Cody and the east entrance to Yellowstone Park. This area receives considerable attention due to its heavy use by both humans and grizzlies.

Wapiti Valley Wayside:

The new center was staffed as in the past: Memorial Day through Labor Day (weekdays 8:00 A.M. - 8:00 P.M. with personnel working six-hour shifts, and weekends from 8:00 A.M. - 5:00 P.M.) One difference was that weekday afternoon shifts were covered by employees in full FS uniform; in the past volunteers had the afternoon shift. A trained volunteer staff consisting of 14 individuals were weekend hosts. The major emphasis continues to be informing the visitors about food storage regulations, camping and hiking in grizzly country, keeping a safe distance, and general information about the daily, yearly and life cycles of grizzlies. Those visitors who did not approach the general information area had the opportunity to view and read new signs about the grizzly that came with the new center. The total number of visitors exceeded 28,000 - this is 10,000 more than in previous years. While the new center may be a contributing factor to increased numbers, travel within the corridor was up significantly which more than likely added to the total.

Interpreters (Naturalist Program):

Between June 15 and September 10, the Wapiti Ranger District, with financial assistance from Rocky Mountain Recreation Company (campground concessionaire), held a greatly expanded interpreter's program. Six individuals made an average of 15 presentations per week. The content of the programs was varied but all included information about recreating safely in grizzly bear country. Of special note are the nature hikes that were incorporated into the programs and proved to be very popular with the visitors. Attendance as documented by presenters approached 1520 guests; of that number 380 came from the campgrounds to the lodges specifically for the programs. Lodge personnel made special efforts to remind guests when programs were scheduled.

Six Sunday presentations were held at the Buffalo Bill Scout Camp as new groups came for a week of camping. With an average attendance of 200 scouts and leaders it is estimated that 1200 individuals learned about recreating safely in grizzly country. Follow-up inspections of camp areas with a recognition program for the best camp exemplifying safe techniques have greatly improved compliance with the food storage regulations.

A change in focus was instituted at the Buffalo Bill Dam Visitors Center (BBDVC). The Forest Service had staff on site five days per week during the summer. Grizzly and black

bear hides (courtesy of U.S. Fish and Wildlife Service) were on display with a FS employee available to answer questions and give information. BBDVC had over 85,000 visitors this past summer. Approximately 30,000 of those received grizzly information from FS personnel.

Safety Talks/Video:

Presentations about working safely in grizzly bear country were given to: US West Communications, Pacific Power (Cody, Worland, Riverton, Casper), and the Wyoming Highway Department. One hundred eighty-seven people attended. The safety video, put out jointly by the Wyoming Highway Department and the Forest Service, was viewed by over 200 people working on the North Fork Highway project.

Additional Education & Information Programs:

The following groups requested and received grizzly bear presentations: Cody Senior Citizens (34), Cody Long Term Care (21), Lovell Senior Citizens (52), Cody Middle School (215), Cody East Side School (156), Cowley Middle School (41).

Concessionaire:

In addition to the financial assistance given the interpretive program, Rocky Mountain Recreation routinely answered questions asked by campground visitors about the grizzly bear and food storage regulations. New, more permanent signs were posted at campground entrance bulletin boards, on general bulletin boards, and in bathrooms. Campground hosts immediately contacted FS personnel if bear activity was evident.

Campground/Trailhead Improvements:

A new, large sign at the entrance to the Forest on the South Fork (GRIZZLY BEAR AREA - SPECIAL RULES APPLY) was installed. For 3-Mile, Sleeping Giant, and Eagle Creek Campgrounds a permanent restriction for hard-sided camping units only was instituted. New bear-resistant food storage boxes were installed at each camp site in Newton Creek Campground on the North Fork and Deer Creek Campground on the South Fork.

Campground & Trailhead Compliance:

Documentation of activities being conducted by three Forest Service protection officers on patrol was continued. Patrols consisted of checking for compliance with the grizzly bear special orders; educating and informing users about camping, hiking, hunting, fishing, etc. in grizzly country; removing road kills; conditioning human behavior during highway "bear jams"; and monitoring grizzly bear activity. Between May 15 and October 1 (not to include hunter patrol) the following activity was documented: approximately 560 courtesy messages left, thanking those practicing safe procedures; 13 violation notices given for minor infractions of the orders; 17 road kills removed from highway rights of way; 7203 individuals contacted; 15 sightings of bears; eight major traffic jams because of bear viewing. All campgrounds and trailheads on the Wapiti Ranger District were monitored.

Summer Homes:

All summer homes on the Wapiti District were inspected at least once for compliance with the grizzly bear special order. No violations were noticed.

Guest Lodges:

All guest lodges were given a courtesy inspection to review proper techniques for preventing bear curiosity and incidents that could lead to a problem. In addition to routine spot reviews, a major unannounced inspection of all lodges took place in July. All lodges were found to be in compliance. However, one lodge experienced a problem when a black bear found a way to remove the cap from a barrel containing kitchen grease. The barrel has been used for several years with no problems. The lodge owner, with encouragement from the Forest Service and WGFDDG, will be addressing the issue and designing a permanent bear-resistant enclosure prior to opening next spring.

1998 is the third year all employees of lodges were required to attend a program on grizzly bears. The programs are focused on communicating to lodge guests what to do and not do while at the lodge, bear behavior traits, how to respond if a bear is encountered, doing routine inspections of the lodge area, etc. Follow-up sessions were held throughout the summer as employee changes occurred. Two hundred nineteen employees received the training.

Hunter Patrol:

Front country hunter patrol was mainly covered by one FPO. Front country statistics for the September - November period are: 521 vehicles logged, 421 flyers placed on vehicles and camps thanking users for compliance, seven warnings issued. Campgrounds and trailheads were monitored as well as Carter Mountain.

3. Grizzly Habitat Effectiveness

Habitat effectiveness is a measure of the degree to which an area of habitat is producing the desired results given its capability. In other words, to what degree is the capability of the habitat being impaired by humans and their activities. This parameter is considered with respect to individual project proposals as they are evaluated, as well as for the entire area of Shoshone National Forest grizzly bear habitat. The latter is often done in conjunction with the annual deliberations of the Yellowstone Ecosystem Grizzly Bear Management Subcommittee. Data from various monitoring efforts, as well as professional judgements are used to assess overall habitat effectiveness for the entire Forest and for specific projects.

The Grizzly Bear Recovery Plan does not currently specify habitat based recovery criteria in which to monitor habitat effectiveness. It does, however, specify several population parameters used to measure population recovery. Although not directly a measure of habitat effectiveness, monitoring of these parameters can give some indication of the capability of the habitat to support bears. Targets for each of these parameters are set in the Recovery Plan that identify levels that must be exceeded or not exceeded, depending on the parameter, for recovery to be achieved. These criteria for the recovery area as a whole are:

1. Fifteen females with cubs over a running six-year average both inside and outside the recovery zone and within a 10 mile area immediately surrounding the recovery zone.
2. Sixteen of 18 Bear Management Units (BMU) occupied by females with young from a running six-year sum of observations. No two adjacent BMUs will be unoccupied.
3. Known human caused mortality not to exceed four percent of the minimum population estimate based on the most recent three-year sum of females with cubs. Furthermore, no more than 30 percent of the four percent mortality limit shall be females.

In 1998, there were 35 unique females with cubs of the year (COY). This is the highest number recorded for the GYA since 1974 when record-keeping began. Numbers of females with COY have exceeded 30 for the last three years. Fifteen of the 18 BMUs were occupied by females with young in 1998. The six-year average for females with cubs of the year was 26 and 18 of 18 BMUs were occupied at least once during the last six years. All recovery objectives are being met. See section on Grizzly Bear Mortalities in this report for 1998 mortality data.

Efforts to assess habitat effectiveness for grizzly bears quantitatively have been underway in the GYA for the last decade. Several approaches have been developed, including the Grizzly Bear Cumulative Effects Model (CEM) and the IGBC access management process (IGBC 1998). Each of these processes evaluates the effects of human activities on grizzly bear habitat effectiveness within bear management subunits. There are 40 subunits that encompass the Grizzly Bear Recovery Area in the GYA. Eleven of these subunits are entirely or partially on the Shoshone National Forest. Subunits were delineated as subdivisions of BMUs to provide further landscape resolution and finer attunement to grizzly bear habitat use patterns.

The CEM is used to assess the inherent productivity of grizzly bear habitat and the impacts of human activities on bear use of that potential. Coefficients of productivity vary with the season, site habitat type, vegetation cover type, nearness to forest/non forest edge, occurrence in an ungulate winter range, occurrence near cutthroat trout spawning streams, and occurrence near sites where army cutworm moths aggregate. Coefficients of human impact vary with the type of activity (linear, point, or dispersed), the intensity of the activity, and the duration. Since the initial run of the CEM for the ecosystem in 1996, coefficients of productivity and coefficients of human impact have been revised. The habitat value (inherent productivity) and habitat effectiveness values (actual availability of that productivity to bears due to human activities) for the subunits on the Shoshone National Forest in 1998 are displayed in Table 8. These outputs are preliminary as the CEM model is still being evaluated. CEM runs will be completed periodically as vegetation and human impacts change or as CEM coefficients are updated.

Table 8. Seasonal outputs of the Grizzly Bear Cumulative Effects Model for subunits all or partially on the Shoshone National Forest, 1998.¹

| Subunit | SPRING | | | ESTRUS | | | EARLY HYPERPHAGIA | | | LATE HYPERPHAGIA | | |
|------------|--------|-----|------|--------|-----|------|-------------------|------|------|------------------|-----|------|
| | HV | HE | %CHG | HV | HE | %CHG | HV | HE | %CHG | HV | HE | %CHG |
| Crandall#1 | 67 | 53 | 21.2 | 110 | 94 | 15.2 | 133 | 78 | 41.5 | 1099 | 800 | 27.2 |
| Crandall#2 | 74 | 52 | 29.9 | 107 | 82 | 24.0 | 191 | 124 | 35.3 | 432 | 329 | 23.8 |
| Crandall#3 | 67 | 53 | 21.7 | 72 | 50 | 31.2 | 201 | 156 | 22.6 | 270 | 208 | 22.9 |
| Shoshone#1 | 41 | 39 | 3.6 | 63 | 50 | 20.0 | 124 | 115 | 7.8 | 296 | 264 | 10.7 |
| Shoshone#2 | 53 | 51 | 4.0 | 62 | 56 | 10.8 | 1465 | 1424 | 2.8 | 422 | 387 | 8.3 |
| Shoshone#3 | 69 | 65 | 6.4 | 72 | 57 | 20.2 | 623 | 583 | 6.5 | 569 | 484 | 15.0 |
| Shoshone#4 | 62 | 57 | 8.7 | 105 | 78 | 25.2 | 415 | 327 | 21.2 | 502 | 392 | 21.9 |
| S.Absar.#1 | 55 | 55 | 1.4 | 62 | 57 | 8.1 | 415 | 392 | 5.4 | 451 | 399 | 11.5 |
| S.Absar.#2 | 41 | 41 | 0.2 | 51 | 45 | 11.0 | 353 | 339 | 4.2 | 314 | 250 | 20.2 |
| S.Absar.#3 | 49 | 46 | 6.5 | 81 | 73 | 9.9 | 329 | 303 | 7.8 | 711 | 551 | 22.6 |
| Lamar #1 | 158 | 127 | 19.5 | 165 | 118 | 28.7 | 208 | 136 | 34.6 | 793 | 571 | 28.0 |

¹ Seasons are: Spring = 3/1 - 5/15, Estrus = 5/16 - 7/15, Early Hyperphagia = 7/16 - 8/31, Late Hyperphagia = 9/1 - 11/30. HV = habitat value, HE = habitat effectiveness, %CHG = % change from HV to HE.
Values for HV and HE are rounded to the nearest whole number and represent a relative measure of the average total net digested energy per unit area obtained by grizzly bears from each subunit during that season. Coefficients are comparable across seasons.

Motorized access is one of the most influential factors affecting grizzly bear use of habitats. Open road density has been utilized historically as a measure of human impacts to grizzly bear habitat. Research indicates that in addition to open road density, restricted roads, motorized trails, and high use hiking trails, are important factors in determining habitat use and mortality risk for grizzly bears. Areas free of motorized access and high use trails (secure areas) are also known to be important for grizzly bears, especially adult females. Open motorized access route density (OMARD) > 1 mile/sq mi, total motorized access route density (TMARD) > 2 miles/sq mi and secure areas are being considered as habitat standards in the conservation strategy process for grizzly bears and for inclusion as habitat criteria in the Grizzly Bear Recovery Plan. Values for each of these parameters in 1998 for subunits all or partially on the Shoshone National Forest are presented in Table 9. Outputs were calculated using methodology outlined in the IGBC Taskforce Report (IGBC 1998).

Table 9. 1998 seasonal values for secure areas, Open Road Density >1 mile/sq mi (OMARD), and Total Access Route Density (TMARD) for subunits all or partially on the Shoshone National Forest.¹

| Subunit | Size (sq mi) | Season 1(3/1-7/15) | | Season 2(7/16-11/30) | | Yearlong |
|------------|--------------|------------------------|---------------|------------------------|--------------|------------------------|
| | | % OMARD > 1 MILE/SQ MI | % SECURE AREA | % OMARD > 1 MILE/SQ MI | %SECURE AREA | % TMARD > 2 MILE/SQ MI |
| Crandall#1 | 130 | 11 | 80 | 16 | 58 | 3 |
| Crandall#2 | 316 | 15 | 83 | 16 | 82 | 9 |
| Crandall#3 | 222 | 13 | 81 | 16 | 81 | 7 |
| Shoshone#1 | 122 | 1 | 98 | 1 | 98 | 1 |
| Shoshone#2 | 132 | 1 | 99 | 1 | 99 | 0 |
| Shoshone#3 | 141 | 3 | 97 | 3 | 97 | 1 |
| Shoshone#4 | 189 | 4 | 94 | 4 | 94 | 1 |
| S.Absar.#1 | 163 | 0 | 99 | 0 | 99 | 0 |
| S.Absar.#2 | 191 | 0 | 100 | 0 | 100 | 0 |
| S.Absar.#3 | 348 | 3 | 97 | 3 | 96 | 2 |
| Lamar #1 | 300 | 6 | 91 | 7 | 80 | 3 |

¹ Season 1 combines the spring and estrus periods from the Grizzly Bear Cumulative Effects Model (CEM) seasons. Season 2 combines the early and late hyperphagia periods from CEM. Values are rounded to the nearest whole number. Databases used to calculate these values are the best available information as of 1998 and are being evaluated for accuracy.

Evaluation

All recovery plan population parameters for the ecosystem were met in 1998. The habitats on the Forest contributed significantly to meeting these targets and to the overall goal of grizzly bear recovery. No known human caused mortalities occurred on the Forest. A minimum of twelve females with cubs of the year were observed on the Forest and all BMUs were occupied by females with young. Grizzly bear habitat on the Forest appears to be stable to increasing. Expansion of bears into new areas and apparent increases in population size and reproduction (females with cubs) on the Forest all point in the direction of positive habitat effectiveness. Continued progress in achievement of population recovery objectives will serve as a barometer for overall habitat effectiveness.

The Shoshone National Forest continues to assess the impact of projects on habitat effectiveness at the site specific level, as well as on the Forest as a whole using assessment tools such as biological evaluations, adherence to the Interagency Grizzly Bear Guidelines, consultation with the U.S. Fish and Wildlife Service, and various reporting and monitoring efforts. These measures appear to have been successful in maintaining habitat effectiveness for grizzly bears on the Forest.

The Forest completed the necessary databases for analysis of habitat effectiveness using the CEM and the IGBC access management process. All areas within the grizzly bear

recovery zone were evaluated using these two tools in 1998. Interpretation of outputs from and an evaluation of assumptions and processes used for CEM and access management and the specific relationship to bear habitat effectiveness are still being evaluated at the ecosystem level. The Forest will continue to use these tools to monitor and evaluate habitat effectiveness for bears and take whatever action is necessary to maintain habitat for grizzly bears.

It is apparent that open and total motorized access route densities within subunits on the Forest are low (Table 9). Secure areas make up greater than 80% of each subunit during each season, with the exception of Crandall/Sunlight subunit #1 during season 2. This reduction in secure area is due to high non-motorized trail use on the Beartooth plateau during the summer. Data are currently lacking to validate the actual impact to bear habitat effectiveness due to high non-motorized trail use. This parameter is included at this point until further studies are conducted to verify the impact. Motorized access route densities amount to less than 4% of each subunit that is entirely on the Forest, with the exception of the Crandall/Sunlight subunits. All of the motorized access route density shown for Lamar subunit 1 is a result of activities in Yellowstone Park and the Gallatin National Forest. Much of the motorized access route density displayed for the Crandall/Sunlight subunits is due to the existence of state and county highways and private roads.

Habitat value and habitat effectiveness values from the CEM are an estimate of the relative value of subunits in providing foods for bears during the four seasons (Table 8). Spring and estrus values on the Forest are much lower than early and late hyperphagia values. This is fairly constant across the ecosystem with only a few areas (cutthroat trout spawning areas and ungulate winter ranges) providing high values for bears during spring and estrus. Highest values for early hyperphagia are associated with moth aggregation sites (Shoshone subunits 2 and 3). Subunits with an abundance of whitebark pine provide the greatest food value for bears in the late hyperphagia period (Crandall 1, Lamar 1 and South Absaroka 3). The percent change parameter is an estimate of the reduction in availability of foods to bears during the specified season due to human activities. However, the level of this % change parameter is not directly related to the overall impact on bears. The evaluation needs to consider the magnitude of HV, the size of the subunit and the density of bears.

4. Wolf Population Status

The endangered gray wolf was reintroduced into Yellowstone National Park in January of 1995. Fourteen wolves relocated from Alberta, Canada were the beginning of an effort to reestablish gray wolves in the Yellowstone Ecosystem. Seventeen additional wolves from British Columbia, Canada were reintroduced to Yellowstone National Park in the latter part of January 1996. These animals, and any other native wolves that could possibly remain in the area, are currently classified as a "non-essential experimental" population which provides for additional management flexibility.

Nine groups of wolves including seven packs and several loners for a total of 85 wolves occupied the GYA at the end of 1997. By October 1, 1998 there were 10 groups of wolves (not all had breeding pairs) and several loners for a total of 121 wolves. Seven of the packs had eight litters and a total of at least 42 pups.

Wolves are monitored as closely as circumstances will permit by the U.S. Fish and Wildlife Service and the National Park Service. The Forest maintains contact with representatives of the U.S. Fish and Wildlife Service and the National Park Service regarding the status and location of the reintroduced wolves as much as possible. It has been difficult in the past to obtain specific information on all activities of wolves on the Forest and even the weekly reports are not always received. However beginning in February 1998, weekly reports were posted on the U.S. Fish and Wildlife Service, Region 6 Internet site (<http://www.r6.fws.gov/wolf/index.htm>). In addition, the U.S. Fish and Wildlife Service has hired two new employees to monitor and work with wolves in Wyoming. Information in future years will likely be more readily available.

Evaluation

In late 1996 the Washakie pack formed from one wolf from the Soda Butte pack and one from the Nez Perce pack. They dened and produced 5 pups in the Six Mile drainage on the Shoshone National Forest. This was the first pack to den outside of Yellowstone Park in Wyoming and was the southern-most pack of gray wolves in the northern hemisphere. They spent the summer and early fall of 1997 in the vicinity of the den site in the Six Mile Creek and Dunoir Valley. They were all alive and behaving themselves as of September 30, 1997. However, in October the alpha male began to kill livestock on the Diamond G Ranch in the Dunoir and was shot by Wildlife Services' agents on October 26, 1997. The female and 5 pups continued to occupy the area through June of 1998, at one time located south of highway 26. Additional livestock depredations resulted in removal by Wildlife Services of the adult female and one of the yearlings in mid June. The remaining four yearlings stayed in the area until late July when they moved to Yellowstone. However, in late August one or two non radio-collared wolves were sighted on and near the Diamond G Ranch. It was unknown if they were some of the Washakie pack wolves. Agents of the Wildlife Services attempted to trap the wolves, even though there had not been any further livestock killings, but as of October 1, 1998 they had not been successful. In late September one of the wolves from the Thorofare pack was located near the Diamond G Ranch. It is not known if any of the other Thorofare wolves were in the Area.

Sometime in the spring of 1998 a pair of wolves, known as the Sunlight Pair, began using areas on the Shoshone National Forest in the Trail Creek and Painter Creek Area on the Clarks Fork District. In early July they moved back into Yellowstone National Park, but returned and were located in the same general area on the Forest in August and September of 1998. They did not produce pups. In addition to documentation of this pair in the Sunlight Area from the U.S. Fish and Wildlife Service, there have been several reports from individuals observing one or both of these wolves.

The U.S. Fish and Wildlife Service documented that in late December of 1997 and early January of 1998 the Druid Pack was located near Crandall Creek and the Crystal Creek pack in the Grinnell Creek drainage on the Forest. Several individuals have reported seeing wolves in the various side drainages of the North Fork of the Shoshone at various times during the summer and fall of 1998. Apparently both of these packs periodically use these areas and are seldom on the Forest during radio telemetry flights. It has been previously documented that the Soda Butte pack also occasionally uses part of the Forest

on the Clarks Fork District. Forest personnel did not receive any reports of sightings of this pack on the Forest during FY 98.

Because the Forest has considerable desirable wolf habitat in the form of migratory big game herds, it is probable that wolf use and denning on the Forest will increase as recovery progresses. As more pups are born there will be more wolves without radio-collars, making tracking and documentation of use more difficult.

5. Inventory of Nesting Peregrine Falcons

A cooperative recovery effort for this species has been ongoing throughout the Forest for the past two decades. Recent efforts by Wyoming Game and Fish Department (WGFD) and Forest personnel have concentrated on monitoring reproductive success and population expansion as the species moves toward recovery and delisting. The items monitored and results for the 1998 nesting season are documented below. Some historical information is included for perspective.

Monitored items: number of nest sites, number of nesting pairs, nesting success, and production for the entire Shoshone National Forest (SNF) area. Nineteen priority sites were inventoried for nesting birds, including six for the Clarks Fork (CF) District, five for Wapiti (W), four for Washakie (WA), and four for Wind River (WR).

Evaluation

Nesting site occupancy by district was CF-4, W-3, WA-4, and WR-3. These fourteen pairs successfully fledged at least 28 young or two per pair. This is the highest level of production recorded on the Forest since monitoring of the reintroduction effort began. Since 1989, the number of known nesting pairs on the SNF has gradually increased from two to the current 14, while total production has increased from three in 1989, to the present 28 young. These results, as well as those occurring elsewhere in Wyoming and throughout the nation, have culminated in the announcement last August by the Secretary of the Interior that the Peregrine falcon is expected to be removed soon from the endangered species list.

6. Inventory of Nesting Bald Eagles

A cooperative recovery effort for this species has been ongoing throughout the Greater Yellowstone Area, the state of Wyoming, and many other areas of the country for most of the past two decades.

Monitored items: Nesting surveys on the Shoshone have been conducted annually for the past several years as part of Wyoming statewide surveys.

Evaluation

The results of the annual surveys have failed to reveal any current nesting by bald eagles on the Forest. However, two pairs of eagles nest very close to the Forest boundary in the Dunoir and Whiskey Mountain areas. The low numbers of nesting pairs on and near the Forest is believed to relate to marginal habitat conditions including a relatively limited

prey base during brood rearing and possibly a short supply of suitable nesting structures adjacent to aquatic habitats. Throughout the state of Wyoming and in the Greater Yellowstone Area the number of nesting pairs has increased dramatically in the past 20 years. With the greatly expanded population nearby, nesting on the Forest may only be a matter of time.

TIMBER RESOURCES

1. Allowable Sale Quantity

The Allowable Sale Quantity (ASQ) is the maximum volume of timber that may be sold from the suitable timber base during the 10-year planning period specified in the Forest Plan. The quantity is normally expressed as the "average annual allowable sale quantity."

The Shoshone National Forest Land and Resource Management Plan (Forest Plan) was amended in August 1994 to reflect a recalculated ASQ. The revised ASQ is 45 million board feet (MMBF) or an average annual of 4.5 MMBF. Each year the Forest is given an output accomplishment target by the Regional Office based on what Forest personnel thought could be accomplished and tied to the Forest's ASQ. The targets and accomplishments are tracked in the Management Attainment Report (MAR). The 98 Forest target for sawtimber was 2.25 MMBF and for products other than sawlogs (POL) was 3.5 MMBF, for a total of 5.75 MMBF.

Evaluation

In FY 98 the Forest sold 136 MBF of green sawlog or 0.136 MMBF. This represents approximately 6% of the Forest target for the fiscal year. In addition the Forest sold 3.320 MMBF of small salvage sales, fuelwood and other products sales (post and pole, commercial fuelwood, small salvage/house log sales). This represents approximately 95% of the Forest target for POL. In total 3.456 MMBF were sold in FY 98. The reason for the shortfall in the sawlog target is the delay of the Ellsbury Timber Sale. The NEPA process was not completed on time. It is expected the sale will be offered in FY 99.

As mentioned in last year's Monitoring and Evaluation Report, a field review was conducted on some closed timber sales in fiscal years 96 and 97. This type of review continued in FY 98. The reviews conducted in FY 96 and 97 indicated that in some of the older sales - late 1980s and early 1990s - the volume of wood designated for harvesting in the timber sale contracts was far less than the volume specified in the silvicultural prescriptions. In more recent sales - mid to late 1990s - the volume designated via the timber sale contract was a close match to the volume in the silvicultural prescriptions. Monitoring conducted this year indicates the latter trend is continuing. Monitoring of sales this year indicates that in a few instances, more attention needs to be focused on presale boundary delineation and marking. In older timber sale areas some boundaries were difficult to follow. They did not follow topographic features such as ridges or valleys, or existing roads or drainages. This issue will be addressed by spending more time reviewing on-the-ground sale layout procedures.

The Shoshone National Forest ASQ will be revisited as part of the Forest Plan revision process.

2. Restocking of Clearcuts

The National Forest Management Act (NFMA) requires that where trees are harvested for timber production "the cuttings shall be made in such a way as to assure that the technology and knowledge exists to adequately restock the lands within five years after final harvest." For clearcuts that means five years after the clearcut occurs (36 CFR 219.27 sec. (c)(3)). This monitoring item was intended to ensure that clearcuts are restocked by the fifth year by requiring regeneration surveys one, three, and five years after the clearcut.

Except for powerline right-of-way clearings and highway construction projects this year, clearcuts have not occurred on the Shoshone National Forest since 1992. Fifty-six acres were treated by clearcut representing three timber sales on the Wind River District (Table 10). The Forest has monitored these sales since their completion.

Table 10. Acres treated by clearcuts in the last decade

| Sale Name | Sale Date | Clearcut Acres |
|--------------------------|------------------|-----------------------|
| Union Pass Blowdown | 06/1992 | 22 |
| Trapper Creek | 06/1992 | 12 |
| Wildcat Blowdown Salvage | 09/1992 | 22 |

The Forest Plan requires that this item be monitored by regeneration survey. The Union Pass Blowdown, Trapper Creek and Wildcat Blowdown Sales were inspected for regeneration certification (fifth year survey) in 1997.

Evaluation

The Union Pass Blowdown Salvage sale was certified as stocked and reported in last year's monitoring report. The Trapper Creek sale is scheduled for planting in the year 2000. Seedlings for the scheduled planting are growing in the nursery this year. Continued monitoring on the Wildcat Blowdown in FY 98 indicated that regeneration on this site was insufficient to meet certification requirements. The sites associated with this area will be scheduled for spot planting in FY 01. Certification was conducted on the Geyser Creek and Louis Lake sale areas, and both of these areas were certified in FY 98.

Additional Reforestation Monitoring

Regeneration surveys are not required for acres clearcut prior to 1976. Although the majority of clearcuts on the Shoshone National Forest occurred prior to the passage of NFMA in 1976, the Forest spends considerable time visiting, evaluating and surveying those acres in order to update records and evaluate past silvicultural treatments on the Forest. Monitoring indicates that regeneration limitations are often due to site preparation or to the slash disposal methods applied.

In FY 98 approximately 3,694 acres of prior treatments were surveyed and 3426 acres were certified on the South Zone of the Forest (Washakie and Wind River Districts). On the North Zone (Clarks Fork, Greybull and Wapiti Districts) in areas that were planted after the 1988 fires, first year survival exams were accomplished on 639 acres by force

account crews this year. Results showed 71% overall seedling survival with a range of 53% to 85% in individual units. Third year survival exams were completed on 611 acres showing an overall survival rate of 55%. Survival ranged from 39% to 65%. Competition from grasses and other vegetation, and dry conditions directly after the planting season affected the survival of these plantations. Cattle and wildlife damage were also factors. On the North Zone of the Forest 639 acres were planted in FY 98. Of these, 637 acres were planted by contract and two acres were planted by force account crews and volunteers. In addition to the planting that occurred on the Clarks Fork District this year in areas burned by the 1988 fires, extensive reforestation survey work was also done on 4000 acres to prepare for the FY 99 and 2000 reforestation program.

Additional new monitoring occurred this year on the Clarks Fork District. This monitoring was focused on the 1988 Clover Mist Fire area but included other adjacent acreage as well. Approximately 21,700 acres of low elevation color infrared air photography was completed by contract. This information will be used to evaluate reforestation effects for both natural regeneration and plantations. It will also be used to document change from the 1988 fires to the present and will be a basis for outyear planning for reforestation and timber stand improvement opportunities. This information will be used by personnel in other resource areas, such as recreation, special uses, and the integrated resource inventory (IRI) group in preparation of the common vegetation unit. The IRI is scheduled to begin on the Shoshone National Forest in FY 99.

3. Timber Stand Improvements

Timber Stand Improvement (TSI) refers to vegetation management activities that improve the composition, condition or growth of a stand of trees. This monitoring item requires that acres of timber stand improvement not vary more than 25% from what is planned annually. The Forest Plan projected 121 acres per year of TSI for the time period between 1991 and 2000 (Land and Resource Management Plan, Table III-1, page III-14). Table 11 lists the number of the TSI acres projected by the Forest Plan and accomplished for the last eight years.

Table 11. Timber Stand Improvement, 1991-1998.

| Year | Forest Plan Acres | Acres Treated | % of Forest Plan |
|--------------|-------------------|---------------|------------------|
| 1991 | 121 | 40 | 67 |
| 1992 | 121 | 407 | 336 |
| 1993 | 121 | 0 | 0 |
| 1994 | 121 | 140 | 115 |
| 1995 | 121 | 250 | 206 |
| 1996 | 121 | 117 | 97 |
| 1997 | 121 | 455 | 376 |
| 1998 | 121 | 937 | 774 |
| 8 Yr Average | 121 | 293 | 246 |

Evaluation

Between 1991 and 1998 the Forest accomplished on average approximately 246% of what the Forest Plan projected for acres of TSI. Acreage accomplishments vary from year to year because some of the contracts for TSI are multi-year. In some years accomplishments may exceed the planned acreage target while in others they are under estimates. As mentioned in last year's report, monitoring indicates that one thinning may be more cost effective than the two modeled in the 1986 Forest Plan.

In FY 98 extensive TSI survey work was done on the Clarks Fork District. About 800 acres were surveyed and a portion will be treated by contract in FY 99. In addition, Forest personnel on the Wind River and Washakie Districts surveyed a number of clearcuts dating back to the 1960s and 70s for regeneration survival, as documented in item #2. Through these surveys it was determined that almost all of the old (1960-1970) treatment areas were fully stocked to overstocked and in need of thinning. As a result of this monitoring information thinning over the next five years will exceed the Forest Plan average of 121 acres per year. Continued monitoring in FY 99 will help finalize these needs and prioritize the TSI treatment areas. This information will be utilized during the Forest Plan revision process scheduled to begin in FY 2000.

4. Growth Response

Growth response is monitored by Forest personnel through stand exam surveys. In FY 98 the North Zone of the Forest inventoried 10,529 acres. This stand exam survey data will be used in conjunction with the other stand exam data gathered in prior years to revise the Forest Plan. In addition to collecting stand exam data, the Forest surveyed approximately 7,000 acres of vegetation using analog and digital airborne color videography. This airborne photography was obtained with assistance from remote sensing personnel from Regions 2 and 3 of the U.S. Forest Service. This type of survey will aid in determining change detection in vegetation and hopefully growth response in different vegetation types.

5. Size of Clearcuts

Clearcuts greater than 40 acres in size require the Regional Forester's approval. Clearcuts are rare on the Shoshone National Forest. Those that have occurred (see discussion under Restocking of Clearcuts heading) since 1989 have not exceeded the 40 acre limit.

6. Lands Not Suited for Timber Production

Lands not included in the suited timber base may not be managed for wood fiber production but may be managed for other resource objectives. In some situations wood fiber is a by-product of resource management such as when openings are created for wildlife in a forested area. The Forest Plan Standards and Guidelines specify what types of activities are permissible outside the suited timber base and are reviewed before activity occurs. This monitoring item was intended to guarantee that lands outside the suited timber base are managed for the appropriate resource objectives.

The Sheep Ridge Challenge Cost Share Project was completed this year on the Wind River District in cooperation with the Wyoming Game and Fish Department. Vegetation treatment

was proposed to create a migration corridor for bighorn sheep. The slash left from this treatment was burned last year and the area was seeded in FY 98. Monitoring of this project will continue in FY 99.

The Switchback sale, as mentioned in last year's Monitoring and Evaluation Report, remains unsold. The Forest is considering offering it for sale in FY 99.

The Washakie District completed a project along the Loop Road in FY 98 that involved harvesting trees on non-suited timber lands. The purposes of the treatment were to improve sight distance along the road, to increase vegetative diversity, and to help regenerate aspen. Contracts were let to remove trees along the roadway.

Evaluation

These and other vegetation management projects removed an estimated 3.0 MMBF of products other than green sawlogs (POL) from the Forest this year. Products such as fuelwood (commercial and personal use), post and poles, and houselogs were utilized by individuals, communities and businesses that are adjacent to the Forest. These products are removed from both suited and non-suited timber lands in roughly a 50/50 proportion.

VISUALS

Adopted Visual Quality Objective (VQO)

Visual quality objectives (VQO) are the goals that describe the acceptable degrees of alteration allowed in the natural landscape (Shoshone Forest Plan, FEIS, Vol.I, page VII-35). This monitoring item was intended to ensure that projects meet VQO or that corrective action, such as mitigation, be initiated when it appears a project will not meet VQO.

VQO are monitored on a project level and attained through project implementation. Projects are monitored for VQO compliance on the Shoshone National Forest through the NEPA process. If project level analysis indicates that an existing VQO, as identified in the Forest Plan, is not going to be met by the proposed action two options are available. First, if the VQO is inappropriate for the project area a Forest Plan amendment can change the VQO. The amendment is accomplished through NEPA. Second, if the visual analysis shows that the VQO is appropriate for the project area but is not being met (or is not going to be met), mitigation measures must be taken to meet the VQO in a minimum amount of time. Timeframes for meeting VQO vary between individual visual quality objectives.

Evaluation

Scenery Management System

It was expected that the Scenery Management System (SMS) would be completed for the Wind River District by the end of FY 98. However, due to priority projects, the SMS was put on hold and not completed. More work has been accomplished at a higher quality with the use of ArcView software for spatial analysis.

North Fork Highway Construction

The second phase of highway construction is well underway. Blasting of the rock wall faces is near completion. Scenery objectives have been maintained for the most part during the blasting operation, but at this point half casts (vertical rock scarring) along the cliff faces are evident. The Environmental Impact Statement for this project states, "Any blast lines from drill holes remaining after the blasting will be removed from the final cut face." It is undecided how this will be accomplished, but suggestions so far have included the use of high pressured water. Also being negotiated is the intent of the EIS. The advisory committee has suggested that the only areas warranting mitigation are those areas seen by the user. The "user" in this case consists mainly of visitors in passenger vehicles, a few hikers and river rafters. The seen area may be described roughly from the ground level of the highway to 15 - 20 feet up above the vehicle. The recommendation also involves making a determination on a case by case basis, so that differing situations allow for changes in mitigation. At this time no decision has been made. A two hour training on visual techniques was held for MK Construction. This helped communicate the scenery objectives. A landscape corridor plan has been completed for this second phase of the project. Along the highway, right-of-way berms and boulders were strategically placed to improve the scenery by enhancing the disturbed portion so that it blends with the natural landscape. Techniques such as this are necessary to meet the objective of "protect, restore or enhance the roadside landscape" (Landscape and Erosion Control Plan for Buffalo Bill Cody Scenic Byway, March 1998).

Other areas which received visual monitoring were the Trail Lake road, and the Wyoming Centennial Scenic Byway (WCSB). Both corridors meet their visual quality objectives. Plans are in the works for upgrading the WCSB and reconstructing the highway corridor. More attention will also be given to the Ramshorn oil and gas project analysis in the coming year.

In September of 1998 visual issues were identified during the Forest Plan monitoring field trip. While at the Chief Joseph Highway, conflicts were identified between Forest Plan management area allocation and direction, and scenic byway management requirements. This discussion may apply to the other three scenic byways on the Forest.

In the decision on the Ellsbury Timber Sale, the District Ranger states in regard to proposed harvest units in the foreground view from Chief Joseph Scenic Byway:

"...resolution of the management conflict between timber harvest activities within Management Area 7E and visual quality objectives within a scenic corridor would best be resolved during Forest Plan revision or within a comprehensive corridor management plan. The analysis associated with this proposed project did not provide for a comprehensive look at visuals within the entire corridor, therefore I decided to drop those units from consideration ...".

Further, "those stands are still in need of treatment...but treatment needs to be planned in the context of overall scenic byway corridor management". Implicit in this decision, at least along the Chief Joseph Scenic Byway, is the notion that any significant treatment altering retention visual quality should be deferred pending the necessary planning. This same logic should be applied to the other Forest scenic byways.

WATER RESOURCES

1. Effects of specific resource management practices on waters of the U.S.

Programmatic Level Monitoring

Stream Health Assessments

As discussed in the 1997 report, analysis summaries for twenty-five stream reaches across the North Zone (Clarks Fork, Wapiti and Greybull Districts) that were monitored during 1997 would be included in this year's report. Please reference the riparian section for additional information.

Evaluation

Stream health monitoring in preparation for Forest Plan revision is now complete. Information has been collected on approximately 120 stream reaches since 1994. This information is useful for validating existing Plan direction and in determining if new or revised direction is needed.

Field work purposefully focused on reaches of stream where concerns with stream health were known or suspected. Many known or suspected concerns are so because of past management activities. Heavy grazing in the early 1900s, tie-hacking in the early and mid-1900s, and large-scale timber harvest and road construction activity between 1950 and 1990 are examples. This disclaimer is important because the Forest contains many more miles of stream where health is not a concern than miles where it is.

Many of the streams of concern are in a recovery mode from past management. Time is the most appropriate remediation. There are some streams where recovery may be accelerated through land treatment measures. Such possibilities are being pursued.

The most significant impact identified through the monitoring effort is the delivery of sediment from the transportation network to the stream system. Improved erosion control, road obliteration, and travel management are necessary to alleviate this impact. The emphasis for the watershed improvement program on the Forest has been changed accordingly (see below).

Some streams continue to be negatively impacted by ungulate use. The Forest is working cooperatively with grazing permittees and the Wyoming Game and Fish Department to correct these situations.

Prescribed Fire

The Forest's prescribed fire program continues to expand. Concurrent with this is an increased emphasis, agency-wide, on watershed restoration, protection and management. Coordination between the two programs therefore is important.

Evaluation

A critical review of the Forest Plan is needed to ensure watershed protection is being afforded. This review should occur as part of the upcoming Plan revision.

Project Level Monitoring

North Fork Highway Reconstruction

Monitoring of the Cody to Yellowstone Highway reconstruction occurred throughout fiscal year 1998. This monitoring focused on compliance with Forest Plan Standards and Guidelines, the Corps of Engineers 404 permit, the Wyoming Department of Environmental Quality Pollution Prevention Plan and their water quality standards.

Evaluation

The Pahaska Section was completed early in the year. Monitoring indicates, for the most part, overall project objectives related to watershed protection have been or are being met. Some concerns with storm water control and wetland mitigation were identified and requisite corrective action has been or is being implemented as necessary.

Construction on the Hanging Rock Section was started in mid-year. Monitoring indicates compliance with watershed protection criteria is generally being implemented. Some minor concerns were identified and subsequently resolved.

Winter Range Utilization

Monitoring of winter ranges and the effects of ungulate use on watershed condition continued in 1998. A cooperative review between the Shoshone National Forest and Wyoming Game and Fish Department personnel of winter range in the Horse Creek and Sweetwater drainages (Wapiti District) was conducted during early May. During this review there were also discussions relative to other winter range areas of concern (see 1997 report).

Evaluation

Participants agreed the ride was good for maintaining and improving relations between the Forest and WyG&F. Everyone acknowledged elk numbers are over objective and that WyG&F is continuing to attempt to reduce numbers by increasing license sales and extending seasons. Monitoring needs to continue in this area as well as other areas of concern, such as Elk Fork and Sunlight Basin.

Watershed Improvements

There is an increased emphasis on watershed restoration at all levels of the Forest Service. As a result, the Forest watershed improvements program has expanded considerably over the last few years, in both budget and in the number and kinds of projects. The Forest is focusing its efforts on reducing impacts of the transportation system on watershed condition. This focus is tiered to the recently completed transportation system and stream health inventories (reference the 1996 and 1997 Monitoring and Evaluation Reports).

Evaluation

Major projects designed to 1) improve road drainage and ability of structures to pass flood flows, and 2) disconnect roads from streams were implemented in the Middle Popo Agie, Wiggins Fork, Sunlight Creek, Dick Creek and Long Creek watersheds. These drainages are either Forest watersheds of concern or have stream segments on the Wyoming Department of Environmental Quality 303d list of impaired waterbodies.

Projects were also implemented on the Eagle Creek, Jade Lake and Bear's Ear trails to improve drainage and disconnect them from adjacent streams. Preliminary monitoring of both the road and trail projects indicates they have been effective in improving watershed condition.

In addition to these new projects, monitoring was conducted on past watershed improvement projects in the Wayne's Hole, Wildcat, Ramshorn, Wiggins Fork, Burroughs Creek, and Cartridge Creek areas. For the most part, these projects have been effective in improving watershed condition. Some need for structure maintenance or additional structures were identified on some of these projects.

Livestock Grazing

Monitoring of commercial livestock grazing for compliance with soil and water related permit conditions occurred on several allotments.

Evaluation

Monitoring indicates permit conditions are generally being implemented and are effective in providing watershed protection. Some concerns with utilization and bank trampling were identified on certain allotments. These concerns are being addressed through increased permit compliance checks, construction of off-site water, and changes in unit boundary fences. Allotment management plans are being adjusted accordingly. The Forest is also increasing watershed awareness levels with range management staff through formal and informal training.

Timber Sales

Monitoring of commercial timber sales for compliance with soil and water related permit conditions occurred on several sales.

Evaluation

Monitoring indicates contract clauses are generally being implemented and are effective in providing watershed protection. Some concerns with stream crossings, road locations, erosion control, and harvesting on potentially unstable slopes have been identified. As a result, the Forest is increasing watershed awareness levels with sale preparation and administration staff through formal and informal training.

Special Uses

Monitoring of special use permits for compliance with soil and water related permit conditions occurred on several permits.

Evaluation

Monitoring indicates there is a need to increase permit compliance checks, particularly related to livestock utilization in pastures and maintenance of water transmission lines (ditches). Special Use permits needed to be reviewed to ascertain utilization standards are appropriate for site conditions. Ditches need to be walked on a periodic basis to ensure headgates are functioning properly, and cuts and fills are stable.

2. Water Uses

New water right applications are reviewed to ascertain the requested use will not conflict with existing uses and rights, including instream flow needs quantified by the Big Horn adjudication. Potential conflicts are resolved either as the application is processed through the State Engineer's Office or through Special Use permit clauses once a right is granted.

Evaluation

The Forest was granted two water rights in Fiscal Year 1998 by the Wyoming State Engineer's Office. One was for a new well at the Double Cabin Campground. The other was for stockwater at the new Pahaska Trailhead.

The Forest issued one new water-related Special Use permit to an adjacent private landowner for development of a spring and associated pipeline to deliver water to the private land. Additionally, several existing water-related Special Use permits were renewed. There were no changes made to the water rights associated with these permits.

WILDERNESS

Introduction

The wilderness program on the Forest continues to be guided by the Forest Plan and the Wilderness Implementation Schedules (WIS) for each wilderness area. The overall Forest management philosophy for management of the Shoshone National Forest backcountry, emphasizes a strong field presence of highly qualified, uniformed rangers.

Field priorities have been on trail maintenance, campsite clean-up/rehabilitation, installation of bear attractant facilities, outfitter permit administration, compliance (with the primary focus on grizzly bear attractant storage, outfitting, and caching), and education (focusing primarily on leave no trace techniques and minimizing human/grizzly conflicts). A sufficient amount of continuous incidental visual/photo monitoring occurs to assure that resource trends are stable to upward, and both resource and facility inventories are continuously updated based upon field verification.

1. Wilderness Use

The Shoshone National Forest contains all or part of five wilderness areas totalling 1,379,048 acres or 57% of the total Forest acreage. They are the North Absaroka, Absaroka-Beartooth, Washakie, Fitzpatrick and Popo Agie wilderness areas. Every ranger district on the Forest contains areas of wilderness. WISs have been completed for all wilderness areas on the Forest, and they serve as the basis for wilderness management direction, priorities, and project implementation. A WIS is simply a schedule and priorities for recurring management activities and implementation of special projects in wilderness.

In 1995 the Shoshone experienced an estimated 189,000 recreation visitor days (RVD) in wilderness. In 1996 that number was slightly over 225,000 RVD. Figures for use in

wilderness are not available for 1997 or 1998. Wilderness usage varies between the north and south halves of the Forest and between the wilderness areas themselves.

Evaluation

In general, use has remained relatively stable in the Washakie and North Absaroka Wilderness areas and has been showing a consistent slight increase in the Absaroka-Beartooth, Fitzpatrick, and Popo Agie Wilderness areas. This is occurring in spite of the fact that during the past three years, use during the early summer season has been limited by extremely wet weather and high water.

2. Wilderness Campsite Condition

Wilderness campsite condition is closely tied to wilderness use. Campsites in wilderness areas that receive heavy use are the most impacted ones and tend to be in the poorest condition.

During the summer of 1998, North Zone (Clarks Fork, Wapiti and Greybull Districts) wilderness/backcountry crews monitored wilderness campsite conditions using visual and photo methods as directed in the Program Statement, Strategy, and WIS.

In 1997 the South Zone began to revisit campsites surveyed in the late 1980s, and this effort was continued in 1998. A few sites were selected for inventory in 1997 and 1998 with the goal of redesigning a data form and developing a format for noting a trend over time. Several sites will be prioritized and monitored each year. Experimentation and trials of revisiting sites to measure trends continues to be a challenge, and will be revisited in 1999.

Evaluation

On the North Zone of the Forest the largest impacts in the North Absaroka and Washakie Wilderness areas occur during hunting season when use is concentrated. In the Absaroka-Beartooth Wilderness, the majority of use and impacts occur during the three month summer season. The one area on the North Zone that is being impacted is the Wyoming portion of the Absaroka-Beartooth Wilderness. Two backcountry rangers will be assigned full time to this area during the 1999 field season to attempt to bring the problem under control.

Although there are some impacted sites on the North Zone, the general trend is upward, not only in the condition of campsites but also vegetation condition, and trail conditions. There are still some problems relative to permitted domestic livestock grazing, and this coupled with heavy spring grazing of over objective populations of elk has vegetation in some areas in a downward trend.

Although most sites show visible signs of human use, litter and trash is becoming scarcer each year, except in a few areas. This is due to the constant clean-up and compliance coupled with an increasing awareness and proper ethic on the part of users. Outfitter caches are generally a thing of the past, and other caches are packed out when encountered.

North Zone backcountry personnel issued violation notices and incident notices for a wide variety of violations ranging from motorized vehicles in wilderness to violation of grizzly bear food storage orders. Although snowmobile intrusions into wilderness have declined with boundary marking and increased patrols, work remains to be done. The biggest compliance problems in wilderness are violations of bear attractant storage regulations and improper camp cleanup. Intrusions via motorized vehicles into wilderness, although not a severe problem, appear to have the potential to become a major problem if not dealt with. Outside of wilderness, four wheelers off-road are becoming a problem, and snowmobile use is increasing.

As mentioned in the WISs, and in compliance with the Region 2 Wilderness Education Strategy, education is a preferred use management tool in wilderness on the Shoshone National Forest with the focus on a wilderness user land ethic. Regulations consistent with this policy, and enforcement of them by a strong force of field personnel, are also the standards.

WILDLIFE AND FISH

1. Sensitive Species Surveys

Sensitive species are those plant and animal species identified by a Regional Forester for which population viability is a concern as evidenced by:

- a. significant current or predicted downward trends in population numbers or density
- b. significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution (Forest Service Manual 2670)

During the past six years surveys for many sensitive animal species including the common loon, dwarf shrew, water vole, spotted bat, Townsend's big-eared bat, boreal owl, goshawk, lynx, wolverine, and fisher have been conducted on the SNF through a cooperative cost-shared agreement with the WGF. A review of the status on the Forest for all such species has been completed, and recent efforts have selected a few species for more concentrated survey work each year. The species and items monitored, as well as the results of this effort during the past year are shown below.

Dwarf Shrew and Water Vole

On the Shoshone National Forest survey of potential habitat occurred along the highway corridor of the North Fork of the Shoshone River near streams. Specific habitats included wet meadows, cottonwood riparian, conifer and/or aspen forest, and sagebrush grassland. Areas with vole populations were preferred survey sites as shrews will use vole runways as travel routes. Sites with good ground cover including rocks, down logs, and litter were also preferred trapping sites. Trapping was conducted using museum special traps baited with rolled oats and peanut butter. Eight locations were trapped for shrews, water voles, and other small mammals between August 12 and October 2. A total of 2600 trap nights were recorded.

Evaluation

Three hundred twenty-three small mammals were captured representing 10 species. Those species included the Masked Shrew, Dusky Shrew, Yellow-pine Chipmunk, White-footed Mouse, Deer Mouse, Southern Red-backed Vole, Long-tailed Vole, Montane Vole, Water Vole, and Western Jumping Mouse. Sixty-two *Sorex* (shrews) were captured at seven locations. However, four shrew species, including the dwarf shrew, expected or known to occur on the Forest were not encountered during the survey. Nine water voles were captured at the site near the east entrance to Yellowstone Park.

Information gathered during the past four years indicates the "sensitive" designation for the Water Vole on the Forest may be questionable and should be reconsidered. A sensitive species reevaluation process anticipated to occur in the near future has not yet been scheduled but would be an opportune time to reconsider the status of this species. Additional survey work will be needed in future years for the dwarf shrew to better determine its population status.

Boreal Owl

Surveys were performed along previously established routes in potential nesting habitat during the early spring using taped/playback/broadcast calls and listening for a response. At each stop along the route the surveyor alternates between playing the Boreal Owl tape, and listening for a response. All Boreals heard or observed are recorded. Typical habitat for this species consists mainly of mature high elevation subalpine forests sometimes mixed with mature aspen forest with numerous openings or an open stand structure. These forest types including Engleman spruce, subalpine fir, and lodgepole pine, occur on parts of the Shoshone National Forest but no specific surveys had been conducted for this species prior to 1998. Surveys were conducted in six areas on the Forest in the following locations during the month of March: Brooks Lake Road, Moccasin Basin Road, Wind River Lake Road, Pelham Lake Road, Brooks Lake Creek, and south of the Bearthtooth Highway.

Evaluation

The presence of Boreal Owls was documented on five of the six survey routes. Only the survey along the Brooks Lake Road failed to record Boreals, and even at this location an unidentified owl (presumed to be either a Boreal or a Northern Saw-whet owl) "barked" at the observers but could not be positively identified. A total of eight individuals were positively identified along the five routes, and as many as 12 individuals may have been present. One Boreal was documented along the Pelham Lake Road route, and one along the South of Bearthtooth Highway route. Two Boreals each were documented on the Moccasin Basin Road, Wind River Lake Road, and Brooks Lake Creek routes.

The results of this project are encouraging for the status of this species on the Forest. Based on the timing of the surveys, the response of Boreals to the call tapes, and the fact that some individuals were heard calling before the tape was even played, led the survey observers to conclude that these were male Boreal Owls advertising their presence to potential mates within their territories, and that this species was attempting to breed on the Forest. Additional survey work at some of these locations and at other locations on the Forest will be conducted in 1999 to add to our information base for this species.

Goshawk

A mid-year decision to concentrate considerably more effort into monitoring for the lynx, existing information indicating the general well-being for this species and its habitat on the Forest, and the ongoing status review by the U.S. Fish & Wildlife Service (USFWS) resulted in limited monitoring for goshawks. However, both the Wyoming Game and Fish Department (WGFD) and the Shoshone National Forest continued to solicit observations of nesting goshawks. Follow-up on reports was also carried out.

Evaluation

Limited qualitative observations and follow-up on reports continue to support the thought that Northern Goshawks are relatively common in forested areas on the Forest. Nesting in a variety of habitats throughout Wyoming and on the Forest is documented.

As a part of a species status review by the USFWS, the best scientific data on population trends, types of habitats known to be used by the species, and information on modification, loss, and recovery of forested habitats were sought throughout the west including the Shoshone National Forest. The conclusion of the review included the following statements by the USFWS: "The Service found no evidence of a declining population trend for goshawks. In general, the available data indicate that goshawks remain widely distributed throughout the western United States." "...the Service found no evidence that goshawk habitat is limiting the population, or that a significant curtailment of the species' habitat or range is occurring". These conclusions are consistent with our observations of this species on the Forest. Given all the above information, the priority for monitoring this species is not as high as many other species. However, after one or two more years of soliciting observations, additional baseline surveys may be desirable to provide additional quantitative documentation of the nesting population status on the Forest.

Wolverine

Wolverine tracks were searched for on and adjacent to existing snow machine routes within the Forest during the winter of 1997/98 while additional intensive surveys were conducted for lynx. Survey locations included routes in the following areas and drainage basins: Beartooth Mountains, Burroughs/Horse Creek/Wiggins Fork, Warm Springs/Sheridan Creek, Long Creek, and Togwotee/Fish Creek.

Evaluation

No additional evidence of wolverines was obtained for the Forest during the 1997/98 winter survey period. Information gathered for this species on the Forest during the past decade indicates a continued presence but apparently at very low numbers and scattered distribution. As indicated in the 1997 Monitoring and Evaluation Report, one set of tracks was observed in Robinson Creek on the South Fork of the Shoshone River in the winter survey for 1996/97. Additional reported observation sites in the past few years include the upper North Fork of the Shoshone River drainage, Blackwater Creek, and Republic Creek.

Harlequin Duck

Aerial surveys were conducted for harlequins along 23 streams and rivers on the Forest in 1998. Approximately 315 miles were intensively surveyed. Surveyed locations included Clarks Fork River, Upper Clarks Fork River, Crazy Creek, Gilbert Creek, Lake Creek, Muddy Creek, Beartooth Creek, Crandall Creek, North Fork of Crandall Creek, Hoodoo Creek, Dead Indian Creek, North Fork of the Shoshone River, Grinnell Creek, Fishhawk Creek, Elk Fork Creek, Eagle Creek, South Fork of the Shoshone River, East Fork of Dunoir Creek, Wood River and North Fork, Middle Fork and South Fork of the Wood River, Jakey's Fork, and Dinwoody Creek.

Evaluation

Fourteen harlequins were observed on seven of the streams surveyed. Table 12 contains streams where observations were made and the number of male and female ducks.

Table 12. Harlequin Duck Observations

| Stream Name | Males | Females |
|---------------------------|--------------|----------------|
| Clarks Fork River | 1 | 1 |
| Upper Clarks Fork River | 1 | 1 |
| Crazy Creek | 2 | 0 |
| Lake Creek | 1 | 1 |
| Crandall Creek | 1 | 2 |
| North Fork Shoshone River | 1 | 1 |
| Dinwoody Creek | 1 | 0 |

In addition to these results, observations were also reported for a pair along Sunlight Creek, and a male near Bruce's Campground on the Middle Fork of the Popo Agie River. However, neither observation could be subsequently verified.

This survey and surveys conducted during 1995 and 1996 indicate that this species is sparsely distributed throughout the Forest. Twelve areas have now been documented as being occupied by harlequins in recent years. Data available to date has made it possible to rank streams and rivers according to their apparent importance to this species. Ten rivers or streams have been ranked high importance, 15 moderate, and nine of questionable value to this species. Recently collected and historical information has also facilitated reasonable speculation regarding the types of habitat changes that could be expected to have positive or negative effects on harlequins.

Lynx

The Canada lynx was proposed for listing as a threatened species by US Fish and Wildlife Service in August 1998. The issue immediately facing the Forest with that proposal was the possibility of changed conditions that could elicit further NEPA on specific oil and gas lease parcel applications. In response to that issue, the Forest reviewed its responsibilities under ESA, which includes the necessity for the Forest to confer with USFWS either upon determination that an action is likely to jeopardize the continued existence of a species or at the request of the latter. The Forest Supervisor made a determination in a letter to USFWS on

August 26, 1998 stating that neither condition exists relative to the lynx, therefore there was no need to confer. Further, the Forest indicated that it had altered the lease notices applicable to threatened or endangered species to include the Canada lynx. The result was that the Forest could continue its processing of lease applications in full compliance with NEPA, NFMA, and ESA.

Surveys for lynx tracks were conducted with snowmachines on preexisting snowmachine routes and on areas of the Forest adjacent to, but off these established routes. Locations searched were associated with historic lynx locations, snowshoe hare presence, areas identified with GIS generated habitat maps, or habitats identified during searches the previous two winters. FY 98 represents the third year of survey in the Dubois/Long Creek area. Four snowshoe hare scat transects of 2,461 feet each, which were previously established in the Horse Creek/Burroughs Creek area, were counted and cleared in late June. Hare density was calculated from this information. Four transects varying in length from 1,969 feet to 2,952 feet were also laid out in the Muddy Creek area in the Beartooth Mountains.

Evaluation

Data collected this past year and in the previous two years indicates the presence of lynx near Dubois in the Horse Creek/Burroughs Creek area, Long Creek area, Warm Springs/Sheridan Creek area, Dunoir area and around Togwotee Pass. Lynx tracks were also located near Lander in the Limestone Mountain area. The density for snowshoe hares in the Dubois area was calculated at .37 hares/acre in 1997 and .38 hares/acre in 1998. The density in 1998 for the Beartooth area was .22 hares/acre. Snowshoe hare densities obtained from this survey work are similar to densities reported during cyclic lows in the Territories of Canada.

The initiation of this survey work and study in 1995-96 on the Shoshone precipitated additional work by the Wyoming Game & Fish Department in the adjacent Wyoming Mountain Range, an area known for a healthy breeding population of lynx as late as the 1970s. Information from two radio-collared individuals during the past two years from that area has allowed speculation of potential habitat in other parts of Wyoming based on this limited data including such factors as slope, elevation, and vegetation types. A GIS generated model of potential habitat using that information indicates a rather fragmented boreal forest component on the Shoshone due to topography and associated factors. The larger potential habitat patches on the Shoshone appear to occur in the Dubois/Togwotee Pass area with some additional but more limited potential on parts of the Lander Ranger District and in the Beartooth Mountains.

2. Wildlife and Fish Habitat Improvements

Wildlife

After several years of heavy planning workloads, the Forest was able to continue the trend begun last year of additional emphasis on wildlife habitat improvements. The following activities were monitored for habitat improvement accomplishments.

The number of forestwide acres treated for noxious weeds, acres of sagebrush and conifers burned, and vegetation planting for cover reestablishment were tracked.

Evaluation

Four hundred total acres of noxious weeds were treated on the Shoshone in 1998 to increase native plant species and improve desired habitat conditions and diversity. Of those acres, 250 are on the North Zone of the Forest (Clarks Fork, Greybull and Wapiti Ranger Districts) and 150 acres on the South Zone (Washakie and Wind River Ranger Districts). Approximately 3,450 acres of sagebrush, conifers, or a mix of vegetation types were burned in several locations across the Forest. The goal was to retard plant succession and improve habitat for bighorn sheep, elk, grizzly bears and other wildlife. Reduction of fuels, improvement of forage for domestic livestock, and movement toward long term desired Forest conditions were other primary goals in some of these areas. Finally, 639 acres that were burned in the 1988 wildfires were replanted to coniferous species which will provide wildlife cover in future years. A similar or greater quantity of habitat improvements are anticipated for 1999. It is hoped that funding in future years will continue to allow this or even greater levels of vegetation manipulations to enhance habitat diversity.

Fish

North Fork Highway Reconstruction - Phase I

As fisheries mitigation for Phase I of the North Fork Highway reconstruction project, large keyed rock was installed in various locations along the river in 1997. Objectives were to mitigate fisheries impacts, help stabilize the stream bank, and provide fish habitat. Large, keyed rip-rap was added to the existing Boy Scout pond dike adjacent to the North Fork River in the spring of 1997. This structure was constructed to stabilize the dike and pond behind it that was being washed out by the North Fork Shoshone River, and to provide additional river habitat for fish.

Another portion of Phase I mitigation/enhancement for the North Fork Highway work was the deepening of the Boy Scout pond. Over the years, this pond had become very shallow and could not overwinter fish. The pond was redesigned and construction occurred in 1998.

Evaluation

Subsequent monitoring after spring run-off revealed that almost all the structures installed in 1997 met their objectives. The work done on the upper end of the Boy Scout pond dike was effective at meeting objectives but the very lower end was lacking sufficient rock material and as a result some dike erosion occurred during 1997 spring run-off. The Wyoming Department of Transportation (WYDOT) had the contractor add additional rock to the structure during the spring of 1998. Additionally, the placed rock was back-filled with soil and planted with vegetation. Follow-up monitoring revealed it is now better able to meet objectives.

The Boy Scout pond has been significantly deepened, the outlet reworked, the project area landscaped and planted with vegetation. The work was approved by the Boy Scouts and accepted by the Forest. The pond now has the optimum habitat and capability to overwinter fish.

North Fork Highway Reconstruction - Phase II

Review of the plans for Phase II for the North Fork Highway was conducted by representatives of WYDOT, the Shoshone National Forest and the Wyoming Game & Fish Department in order to develop fisheries mitigation.

After site reviews of the affected area, fisheries mitigation was based on projected linear and area highway encroachments on the river that would impact fish habitat. As a result, various sites were selected for random rock cover placement structures as fisheries mitigation, including three on the North Fork Shoshone River and one on Elks Fork Creek.

Pilot Creek and Horse Creek Projects

Monitoring continued on the Pilot Creek and Horse Creek fish habitat enhancement projects. Details describing the objectives of the enhancement projects may be found in the 1995 Monitoring and Evaluation Report.

Evaluation

The Clarks Fork River channel near Pilot Creek migrated again and eroded a portion of the stream bank. Such events are common for this type of stream system. Remaining planted vegetation on top of the stream bank is doing well, considering natural conditions, and helping to stabilize it. The road barrier has been effective and has kept out all vehicular traffic preventing compaction and damage to vegetation. Some of the planted willows along the stream have either been washed away with the changing stream channel or have been heavily browsed by moose. Depending on future management decisions, additional restoration techniques could be applied to stabilize the banks better and provide additional vegetation and fish cover.

Although some of the structures have washed out, the Horse Creek project has been effective at meeting its objectives overall. Since the structures have been in place fish densities and biomass have increased significantly. At the time, the best available techniques were used. In the future, more improved restoration techniques should be used. Planted willows have been highly successful in providing bank stabilization and overhead fish cover. The structures below the Horse Creek campground have been effective in preventing any further road erosion and providing fish habitat.

3. Winter Range Carrying Capacity

The purpose of this monitoring item is to determine if total forage use by ungulates on crucial winter range areas is within the allowable standard (varies by grazing system and range type but generally about 60% maximum) specified in the Forest Plan, and whether that standard is appropriate. It also helps to determine, where applicable, the relative use by livestock and wild ungulates.

As a result of the 1996 reevaluation of commercial livestock grazing on 36 allotments on the Forest, a decision regarding utilization in crucial winter range was made. Utilization of

herbaceous vegetation during the part of the season when domestic livestock occupy these areas would not exceed 40% of the total forage available for ungulate use. Sixty percent of the forage available for ungulate use in these areas would be for wild ungulates. While this measure currently applies to only 25 allotments, it will likely be applied to other pertinent allotments as they are reevaluated and reauthorization decisions are made.

Monitored items: In the final national budget for FY 98, range resource dollars at the national level were shifted to the Southwest Region of the Forest Service from other regions to help solve pressing problems. Given the limited budget that resulted, the Shoshone National Forest was forced to choose between continuing NEPA analysis of additional range allotments or employing a seasonal crew to perform the subject monitoring. It was decided that scheduled NEPA analysis must continue, and therefore the seasonal range/wildlife crew could not be hired to monitor.

Evaluation

Findings based on ocular observations throughout the late summer through winter period indicate that, in general, winter range is moving toward desired conditions. However, total ungulate use on some winter ranges is still too high. The more palatable browse species are receiving heavy use in some areas.

WGFD and Forest personnel have discussed concerns related to existing versus desired habitat conditions in particular areas, and how conditions are affected by current domestic livestock and wildlife numbers. In recognition of this concern and of the high numbers of elk (above the current objective level in some locations), the WGFD again extended some of the 1998-99 elk hunting seasons for several weeks. Additional monitoring will continue to address this problem in the future.

4. Riparian Condition

Riparian related monitoring was conducted by various interdisciplinary teams and resource specialists across the Forest (see Water Resources, Fisheries, Range and Wildlife sections for additional riparian monitoring). This section includes riparian monitoring that was primarily conducted by the watershed crew or forest aquatic biologist and is not discussed elsewhere.

Watershed field crews collected data including information on channel morphology, instream fine sediment and aquatic habitat in order to determine riparian condition on 25 stream reaches across the North Zone of the Forest (Clarks Fork, Greybull and Wapiti Districts) in 1997. The reach, its location, assessment, causative factors if problems were found and prescriptions to correct them are listed in Table 13.

Evaluation

The 1997 stream health monitoring data is part of the Forest-wide monitoring effort that has been conducted since 1994. As a result of this overall work, useful information has been collected validating Forest Plan direction, where modifications are needed in the Forest Plan, identifying management concerns and potential projects, and the ability to prioritize them on a Forest level. Further discussion is included in the Water Resources section.

Table 13. Results of Stream Reach Monitoring Conducted on the North Zone of the Shoshone National Forest During 1997.

| Stream Name | Reach # | General Location | District | Assessment ¹ | Causative Factors ² | Prescription ³ |
|---------------------------|---------|------------------------------|-------------|-------------------------|--------------------------------|---------------------------|
| East Painter Creek | 161 | Near Forest boundary | Clarks Fork | FAR | 1, 2, 3, 4 | 1, 2, 3, 4 |
| Gooseberry Creek | 158 | Near Forest boundary | Greybull | FAR | 1, 3 | 1, 2, 3 |
| Dick Creek | 167 | Near Forest boundary | Greybull | FAR | 1, 2, 3 | 1, 2, 3, 4 |
| Deer Creek | 148 | Above private land inholding | Greybull | FAR | 1, 2, 3 | 1, 3, 4 |
| Gwinn Fork Dick Creek | 166 | Above confluence half-mile | Greybull | FAR | 1, 2, 3 | 1, 2, 3, 4 |
| Rattlesnake Creek | 147 | In FS inholding | Wapiti | FAR | 1, 2, 3 | 1 |
| North Fork Dick Creek | 153 | Above toprail enclosure | Greybull | FAR to NF | 1, 2, 3 | 1, 2, 3, 4 |
| North Fork Dick Creek | 154 | Near Forest boundary | Greybull | FAR to NF | 1, 2, 3 | 1, 2, 3, 4 |
| Dead Indian Creek | 155 | Below Campground | Clarks Fork | FAR to PFC | 1, 2, 4 | 1, 4, 5 |
| Squaw Creek | 152 | Below County Road | Clarks Fork | NF | 1, 3, 4 | 1, 3 |
| Russell Creek | 149 | In riparian pasture | Clarks Fork | NF | 1, 2 | 1, 4 |
| Russell Creek | 164 | Above riparian pasture | Clarks Fork | NF | 1, 2 | 1, 4 |
| Crandall Creek | 168 | Above North Fork confluence | Clarks Fork | PFC | None | None |
| Sunlight Creek | 145 | Above Gravelbar Creek | Clarks Fork | PFC | None | None |
| North Fork Crandall Creek | 169 | Near confluence | Clarks Fork | PFC | None | None |
| Sunlight Creek | 157 | Above Elk Creek confluence | Clarks Fork | PFC | None | None |
| Wood River | 159 | Near Forest boundary | Greybull | PFC | None | None |
| Greybull River | 151 | Above Jack Creek confluence | Greybull | PFC | None | None |
| Wood River | 165 | Near Double D Ranch | Greybull | PFC | None | None |
| Timber Creek | 156 | Near Forest boundary | Greybull | PFC | None | None |
| South Fork Shoshone River | 162 | Near wilderness boundary | Wapiti | PFC | None | None |
| Trout Creek | 146 | Near Forest boundary | Wapiti | PFC | None | None |
| Rock Creek | 160 | Near Forest boundary | Wapiti | PFC | None | None |
| Belknap Creek | 150 | Near Forest boundary | Wapiti | PFC | None | None |
| Hardpan Creek | 163 | Near Forest boundary | Wapiti | PFC | None | None |

¹ Acronyms follow those found in Prichard et al. *Process for Assessing Proper Functioning Condition*. 1993. TR1737-9. Bureau of Land Management; PFC = Proper Functioning Condition; FAR = Functioning At-risk, no trend apparent; NF - Non-functioning.

² 1 = Past damage (pre-Forest Plan); 2 = Current ungulate grazing within or upstream of the reach; 3 = Transportation system location, drainage or use; 4 = Other (wildfire, developed/dispersed recreation use, etc.).

³ 1 = Time; 2 = Travel management; 3 = Transportation system maintenance (improved drainage, erosion control, closure, or obliteration); 4 = Strengthened ungulate use management; 5 = Improved recreation use management.

Ungulate Grazing

The forest aquatic biologist and other resource specialists conducted riparian monitoring on various livestock allotments. Those that involved the forest aquatic biologist are included here.

Evaluation

Ghost Creek Allotment, Unit 4, Muddy Corrals: Portions of the riparian area along Ghost Creek were previously identified as having been impacted by livestock. It was determined that follow-up monitoring was needed. No improvement was noted in the riparian meadows in 1998. This situation is being addressed in the next round of Range Environmental Assessments which is currently under review and public comment.

Basin allotment, Russell Creek and riparian pasture: This meadow complex had been previously identified as a high use livestock area. An enclosed riparian pasture was constructed to reduce grazing pressure. An interdisciplinary team visited the site and concluded that while conditions had improved somewhat on the inside of the riparian pasture, livestock grazing and bank trampling had intensified outside the pasture causing further riparian damage. Subsequent follow-up monitoring has verified this situation. The problem has been identified and potential solutions are being pursued including off-site watering and modifications to the riparian pasture fence.

Road Culverts

In addition to inventorying roads, the watershed crews inventoried problem road culverts that were potential barriers to upstream fish passage, causing road erosion problems, stream instability, inability to pass high flows, and increased sedimentation that might adversely affect riparian habitat Forest-wide.

Stream health, riparian concerns and fish migration barriers resulting from road culverts were identified on a one mile section of county road adjacent to Squaw Creek on the Clarks Fork District (see also Water Resources Section).

A culvert crossing on Newton Creek in the campground has periodically backed up, flooded portions of the campground, and created a barrier to upstream fish passage. The Forest had initially planned to replace the culvert with a larger bottomless arch culvert.

Evaluation

Overall, 28 problem culverts of various ownerships were identified within the Forest boundary that have caused some problems with fish passage, including inability to pass during high flow. Of these, 19 are the responsibility of the Forest Service. From a fisheries standpoint, initial evaluation has been conducted on the latter and they have been prioritized for future rehabilitation efforts as funding and personnel are available.

With respect to the Squaw Creek county road a cooperative project is being pursued to realign the road out of the stream bottom, remove two problem road culverts, rehabilitate the old road grade, replace a third with a bottomless arch culvert, and rehabilitate the

stream, if needed. This project includes pre- and post-monitoring. It has been delayed and is scheduled to begin during the fall of 1999.

After subsequent monitoring of a major precipitation event in 1998 in the Newton Creek drainage, Forest personnel felt that a bridge would be better able to handle run-off events of this nature over the long term. It is scheduled for installation during the fall of 1999. This is a cooperatively funded project between the Forest and Wyoming Game & Fish Department.

6. Population and Habitat Trend of MIS

Yellowstone Cutthroat Trout

Through a cooperatively funded research project between the Wyoming Game and Fish Department and the Shoshone National Forest, researchers from the University of Wyoming Cooperative Fisheries Unit completed a study to determine the extent and range of Yellowstone cutthroat trout (YSC) on the Forest.

Evaluation

Detailed field survey work indicates that populations of genetically pure YSC that appear demographically and genetically viable exist on the Forest only in portions of the Greybull, Wood and upper South Fork of the Shoshone River. Genes from Snake River cutthroat have been found in these fish and they could be influenced by exotic salmonids in the watershed. YSC have declined primarily due to hybridization and competition with exotic salmonids.

IDT REVIEW AND RECOMMENDATIONS

An interdisciplinary team (IDT) met to discuss and evaluate the results of the FY 98 program of monitoring. In general, the team found that the Forest Plan is valid and reasonably up to date. The team's recommendations have focused mainly on changes to the monitoring section of the Forest Plan. Since the Forest Plan was published in 1986, better data sources and techniques for monitoring have been developed. A more integrated ecosystem approach to monitoring should be adopted rather than the somewhat functional approach in the existing plan.

As of this writing, the process of revising the Shoshone National Forest Plan is tentatively scheduled to begin in FY 2000, pending allocation of funds from the Washington Office. Many of the IDT recommendations listed below are directed at the Forest Plan revision process.

- Review Forest Plan to ensure the appropriate levels of soil, water, and air protection are being afforded in light of increased use of prescribed fire as a management tool.

- Replace old fire terminology in Forest Plan with terminology in newly adopted fire policy.
- Ensure the appropriate guidelines from the Absaroka-Beartooth Wilderness Fire Management Plan are incorporated into the LRMP.
- Evaluate closed roads for decommissioning (obliteration).
- The average annual output for Level 1 road maintenance should be updated to meet national requirements.
- The two thinning treatments for timber harvest prescriptions modeled in the 1986 Forest Plan are not occurring. It's more economically realistic to include one in the model during Forest Plan revision.
- Continue monitoring winter recreation usage and visitors' perceptions (social/economic) to prepare for the Forest Plan revision effort and to support any NEPA analyses that might arise before that.
- Resolve conflict between Forest Plan management area allocation and direction and scenic byway management requirements using corridor planning.
- Special Uses - Increase permit compliance checks, particularly related to livestock utilization in pastures and maintenance of water transmission lines (ditches). Special Use permits need to be reviewed to ascertain utilization standards are appropriate for site conditions. Ditches need to be walked on a periodic basis to ensure headgates are functioning properly, and cuts and fills are stable.

STATUS OF 1997 RECOMMENDATIONS

The 1997 Monitoring and Evaluation Report contained a number of interdisciplinary team recommendations based on that year's monitoring. Recommendations include changes to the Forest Plan that could be addressed through amendment or revision of the plan. The Shoshone National Forest expects to begin revising the Forest Plan in FY 2000 pending allocation of funds. Therefore changes to the Forest Plan will most likely be addressed through that process. The following is a summary of the 1997 recommendations and how they are being addressed.

Forest Plan Revision:

- Reevaluate the number of miles of new road construction and reconstruction projected in the Forest Plan. We are currently deviating from Forest Plan projections.
Status: Address through Forest Plan revision
- Evaluate closed roads and decommission those that are unneeded.
Status: Address through Forest Plan revision

- Develop a way to address excessive bank damage along "E" stream types in meadow areas as a result of ungulate grazing. This is occurring even when overall use is within Forest Plan Standards and Guidelines.

Status: Address through Forest Plan Revision, Integrate Water and Soil Conservation Practices (WCP) handbook in new Forest Plan

Implementation:

Travel Management

- The Forest should set a higher priority on implementation of the existing travel management plan. More resources should be spent on the following activities: putting up signs where use restrictions are not clearly marked, increase law enforcement in problem areas, increase public education, update the current Forest visitor travel map.

Status: Monitoring and patrol efforts were increased. Some volunteer roads were closed. Due to budget constraints, problems still exist.

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| Olga Troxel, Land Mgmt Analyst | Forest Plan Budget, Monitoring Coordinator |
| Jennifer Watson, Lands Specialist | Recreation (Downhill Ski Use) |
| Ray Zubik, Fisheries Biologist | Wildlife & Fish |

PUBLIC PARTICIPATION/DISCLOSURE

This report is available on the FS Web at www.fed.us/r2/shoshone (see link option **Electronic Reading Room, Planning Documents**). It is also printed hard copy and may be obtained by request to Forest Planner, Shoshone National Forest, 808 Meadow Lane, Cody, WY 82414.

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APPENDIX A - FY 1998 MONITORING PLAN

Introduction

Chapter IV of the Shoshone National Forest Land and Resource Management Plan (page IV-1) states that "an annual monitoring program will be prepared as part of the Forest's annual work program. This program will include the details displaying amount and location of monitoring to be accomplished. This will be based on the approved work program and funds available for monitoring." The results of the annual monitoring program will be documented in an annual monitoring report. The report is aimed at the Forest management team and provides the decisionmakers with information about the Forest's progress towards achieving the goals outlined in the Forest Plan and identifies any needs for amendments to or revisions of the Forest Plan.

The following monitoring plan represents the Forest's monitoring priorities for 1998. The monitoring plan assumes no interruptions to this year's program of work by activities such as a severe fire season, appeals or lawsuits, or other unforeseen circumstances that would divert personnel and funds away from field work.

AIR RESOURCE

MONITORING REQUIREMENT: Air Quality

RESPONSIBILITY: Scott Maki

DUE DATE: March 2, 1998

DATA SOURCE: Deposition samples collected at a National Atmospheric Deposition site.

FUNDING/PERSONNEL: Program cost: \$13,500.

MONITORING REQUIREMENT: Air Quality

RESPONSIBILITY: Scott Maki

DUE DATE: March 2, 1998

DATA SOURCE: Air Quality Related Values (AQRV) Wilderness Lake Sampling. Parameters sampled are water quality, macroinvertebrates, and zooplankton. Also sampling vegetation and soils in one watershed for MAGIC computer model.

FUNDING/PERSONNEL: Program Cost \$15,000.

MONITORING REQUIREMENT: Air Quality

RESPONSIBILITY: Scott Maki

DUE DATE: March 2, 1998

DATA SOURCE: Air Quality Related Values (AQRV) Wilderness Lake Sampling, Synoptic Survey of low alkalinity lakes. Samples to be collected by the National Outdoor Leadership School (NOLS), under the direction of the Forest Service

FUNDING/PERSONNEL: Cost to Forest Service: \$1,000;

PLAN BUDGET

MONITORING REQUIREMENT: Actual Costs of Applying Management Direction from Forest Plan

RESPONSIBILITY: Forest Analyst and Budget & Finance Person

DUE DATE: March 2, 1999

DATA SOURCE: Program Accounting and Management Attainment Reporting System

FUNDING/PERSONNEL: 5 person-days, GS-7 and 2 person-days, GS-11

CULTURAL

MONITORING REQUIREMENT: National Register of Historic Places - Listed Sites

RESPONSIBILITY: William Touches Deer Puckett

DUE DATE: Sept. 30, 1999

DATA SOURCE: Visual assessment of site conditions at 10 sites

FUNDING/PERSONNEL: Program cost: \$2,500.

MONITORING REQUIREMENT: National Register of Historic Places - Eligible Sites

RESPONSIBILITY: William Touches Deer Puckett

DUE DATE: Sept. 30, 1999

DATA SOURCE: Visual examination of 20-25 sites which have been determined eligible to the National Register. Also update of site forms and reevaluation in case of some early designated sites.

FUNDING/PERSONNEL: Program Cost \$3,500.

MONITORING REQUIREMENT: Range Permit Issue MOU

RESPONSIBILITY: William Touches Deer Puckett

DUE DATE: March 1, 1999 (for FY 98 info)

DATA SOURCE: Visual examination of areas identified as having high potential for heritage resources and high probability of impacts associated with livestock grazing. (MOU between Forest Service, Advisory Council for Historic Preservation, National Council of State Historic Preservation Officers, Wyoming State Historic Preservation Office.

FUNDING/PERSONNEL: Cost to Forest Service: \$20,000

Note: Monitoring and survey of range allotments for 1998 and beyond is doubtful based on funding reductions.

FACILITIES

MONITORING REQUIREMENT: Road Construction

RESPONSIBILITY: North & South Zone Engineering

DUE DATE: March 2, 1998

DATA SOURCE: Annual MAR and FRP Accomplishment Reports, RoADS Report

FUNDING/PERSONNEL: 1 person-day for Civil Engr Techs (2), 1 person day for Engineer, GM13.

MONITORING REQUIREMENT: Road Reconstruction

RESPONSIBILITY: North and South Zone Engineering

DUE DATE: Nov. 1, 1998

DATA SOURCE: Annual MAR and FRP Accomplishment Reports, RoADS Report

FUNDING/PERSONNEL: 1 person-day for Civil Engr Techs (2), 1 person day for Engineer, GM13.

MONITORING REQUIREMENT: Roads Closed (system road miles closed by project activities)

RESPONSIBILITY: North and South Zone Engineering, Rangers

DUE DATE: Nov. 1, 1998

DATA SOURCE: ROADS Report, Project Work Plans, Annual MAR report.

FUNDING/PERSONNEL: 1 person-day for Civil Engr Techs (2), 1 person day for Engineer, GM13, .5 person days for Rangers.

MONITORING REQUIREMENT: Roads Obliterated (system road miles obliterated by project activities)

RESPONSIBILITY: North and South Zone Engineering, ID teams.

DUE DATE: Nov. 1, 1998

DATA SOURCE: Annual FRP and MAR reports, Project Work Plans, EA/DNs.

FUNDING/PERSONNEL: 1 person-day for Civil Engr Techs (2), 1 person-day for Engineer, GM13, .5 person-days for each Deciding Officer.

MONITORING REQUIREMENT: Level 1 Road Maintenance (Miles of Level 1 maintenance performed)

RESPONSIBILITY: North and South Zone Engineering, WOC temp crew, 2 person-days Hydrologist/Fish Biologist.

DUE DATE: Nov. 1, 1998

DATA SOURCE: Annual MAR reports, completed project work plans, WOC crew field records.

FUNDING/PERSONNEL: 58 days GS9 Engr. Tech, 20 days GS7 Engr. Tech, 27 days GS9 Engineer, 3 days GM13 Engineer, 11 days GS9 Forestry Tech., 10 Days Hydrologist, 60 days GS-5 hydro Techs.

MINERALS

MONITORING REQUIREMENT: Notice of Intentions, Plan of Operations, Application of Permits, and Other Mineral Special Use Permits

RESPONSIBILITY: Forest Minerals Staff Officer

DUE DATE: January 15, 1999

DATA SOURCE: filed Notices of Intentions, Plan of Operations, Applications for Permits to Drill, and Mineral Materials Special Use Permits.

FUNDING/PERSONNEL: .5 person per year for Forest, GS-11

RECREATION

MONITORING REQUIREMENT: Off-road Vehicle Use of Designated Travelways

RESPONSIBILITY: North and South Zone Recreation Coordinators

DUE DATE: March 2, 1999

DATA SOURCE: Citations, warning notices, ranger observations/notes/photos; inventoried orv use areas and access points would be the focus for monitoring, regularly used off-road areas would be prioritized.

FUNDING/PERSONNEL: This item is monitored continuously by District personnel. Approximately .5 person-year for Forest, GS-4-11s; and 2 person-days, GS-11

MONITORING REQUIREMENT: Trail Condition

RESPONSIBILITY: North and South Zone Recreation Coordinators

DUE DATE: March 2, 1999

DATA SOURCE: Project Trail Inspections, trail segment monitoring forms

FUNDING/PERSONNEL: 2 person-years for Forest, GS-4-7s; and 2 person-days, GS-11

MONITORING REQUIREMENT: Dispersed Campsite Condition and Trend

(monitoring of this item is focused on trend)

RESPONSIBILITY: North and South Zone Recreation Coordinators

DUE DATE: March 2, 1999

DATA SOURCE: Modified Cole method. Includes visual observations and use of photo points. Inventoried orv use areas and access points would be the focus for monitoring, regularly used off-road areas and road termini would be prioritized.

FUNDING/PERSONNEL: Dispersed areas along roads - 80 days. Remote dispersed areas .25 person-year for Forest, GS-4-7s; and 2 person-days, GS-11

MONITORING REQUIREMENT: Developed Site Use

RESPONSIBILITY: North and South Zone Recreation Coordinators

DUE DATE: Nov. 1, 1998

DATA SOURCE: MAR Reports, Concessionaire Income Reports, Infrastructure DB

FUNDING/PERSONNEL: 10 person-days, GS-4-7s, 4 person-days GS-9

MONITORING REQUIREMENT: Developed Site Condition

RESPONSIBILITY: North and South Zone Recreation Coordinators

DUE DATE: March 2, 1999

DATA SOURCE: Inspection, concessionaire site inspection reports, MAR report.

FUNDING/PERSONNEL: 10 person-days, GS-4-7s, 4 person-days, GS-9.

MONITORING REQUIREMENT: Downhill Skiing Use

RESPONSIBILITY: Jennifer Watson

DUE DATE: Nov. 1, 1998

DATA SOURCE: Permittee supplied use statistics, resort inspections

FUNDING/PERSONNEL: 7 person-days for Forest, GS-7, 2 person-days, GS 11.

MONITORING REQUIREMENT: Trail Construction/Reconstruction

RESPONSIBILITY: North and South Zone Recreation Coordinators.

DUE DATE: March 2, 1999

DATA SOURCE: MAR Reports

THREATENED, ENDANGERED AND SENSITIVE SPECIES

MONITORING REQUIREMENT: Grizzly Bear Mortalities

RESPONSIBILITY: Forest Supervisor, Wildlife Biologist

DUE DATE: March 2, 1999

DATA SOURCE: Interagency Grizzly Bear Study Team and Montana Fish, Wildlife and Parks annual reports.

FUNDING/PERSONNEL: 2 days GS-12 (Approximately \$500)

MONITORING REQUIREMENT: Compliance with Interagency Grizzly Bear Guidelines

RESPONSIBILITY: Forest Supervisor, District Rangers, team leaders, project biologists, Wildlife Biologist.

DUE DATE: March 2, 1999

DATA SOURCE: Project Biological Assessments and consultation with U.S. Fish and Wildlife Service, grizzly bear compliance patrol reports, law enforcement reports, IGBC grizzly bear conflict annual report.

FUNDING/PERSONNEL: Above noted personnel and district compliance personnel (approximately \$20,000).

MONITORING REQUIREMENT: Grizzly Bear Habitat Effectiveness

RESPONSIBILITY: Forest Supervisor, Wildlife Biologist

DUE DATE: March 2, 1999

DATA SOURCE: Grizzly Bear Cumulative Effects Model (CEM) and the IGBC access analysis process. (NOTE: Completion of this monitoring item is dependant on the following. CEM was run on the Forest in 1996 and model validation and testing is in process. CEM will be run again on the Forest as soon as model testing is completed for the Ecosystem. Databases used in the CEM analysis will be updated for any changes in 1997. Development of the access analysis process is underway and a baseline report will be generated once the process for completing the analysis is finalized.)

FUNDING/PERSONNEL: District biologists, district recreation staff, GIS Coordinator, engineering staff, timber staff, Grizzly Bear/Wolf Center of Excellence (Approximately \$15,000).

MONITORING REQUIREMENT: Wolf Population Status

RESPONSIBILITY: Wildlife Biologist

DUE DATE: March 2, 1999

DATA SOURCE: Weekly Gray Wolf Recovery Progress Report from U.S. Fish and Wildlife Service, reports received from Forest Service Employees and the general public.

FUNDING/PERSONNEL: 10 days GS-12 (approximately \$3,000)

MONITORING REQUIREMENT: Nesting Bald Eagle Surveys

Note: Monitoring was originally focused on wintering bald eagle surveys. It is now focused on nesting pairs because reproductive behavior is more important on the Shoshone National Forest than wintering. The nesting population in the Greater Yellowstone Area is expanding.

RESPONSIBILITY: Forest Wildlife Biologist

DUE DATE: March 2, 1999

DATA SOURCE: Report from WGFD as a part of CCS agreement # 11214109410

FUNDING/PERSONNEL: \$2500 - Forest share. \$2500 WGFD share.

MONITORING REQUIREMENT: Inventory of Nesting Peregrine Falcons (to include number of sites used, number nesting pairs, nesting success, and production)

RESPONSIBILITY: Forest Wildlife Biologist

DUE DATE: March 2, 1999

DATA SOURCE: Report from WGFD as a part of CCS agreement # 11214109410

FUNDING/PERSONNEL: 60 person-days plus helicopter time - \$7,000 total project cost - Forest share = \$3,500 as a part of project mgmt code 2611.

TIMBER

MONITORING REQUIREMENT: Allowable Sale Quantity

RESPONSIBILITY: Rangers and Forest Timber Staff

DUE DATE: March 2, 1999

DATA SOURCE: MAR Report

FUNDING/PERSONNEL: Timber Zone Personnel, Forest Timber Staff, TCE personnel in Laramie. Personnel estimate is 50 days at a cost of \$8,000.

MONITORING REQUIREMENT: Restocking of Clearcuts

RESPONSIBILITY: District Rangers, Forest Silviculturists, Timber Staff

DUE DATE: March 2, 1999

DATA SOURCE: Regeneration Surveys and Stand Exams

FUNDING/PERSONNEL: 20 person-days, \$4,000.00

MONITORING REQUIREMENT: Timber Stand Improvement

RESPONSIBILITY: Zone Timber Personnel, Contracting Officers and Inspectors

DUE DATE: March 2, 1999

DATA SOURCE: MAR Report, Field inspection reports, daily diaries, RMRIS

FUNDING/PERSONNEL: 40 person-days, \$6,000.00

MONITORING REQUIREMENT: Growth Response

RESPONSIBILITY: Zone Timber Personnel, Forest Timber Staff

DUE DATE: March 2, 1999

DATA SOURCE: Stage II data, regeneration survival surveys, MAR reports, RIS data base.

FUNDING/PERSONNEL: 50 person-days, \$8,000.

MONITORING REQUIREMENT: Size of Clearcuts

RESPONSIBILITY: Zone Timber Personnel, District Rangers, Timber Staff Officer

DUE DATE: March 2, 1999

DATA SOURCE: Silvicultural Prescription, Timber Sale Packages, RIS Data Base

FUNDING/PERSONNEL: 10 person-days, \$2,000.

MONITORING REQUIREMENT: Openings Created by Management Activities

RESPONSIBILITY: Timber Staff, ID Teams, Permit or Contract Administrators

DUE DATE: March 2, 1999

DATA SOURCE: NEPA documents, contracts

FUNDING/PERSONNEL: 20 person-days, \$4,000.

MONITORING REQUIREMENT: Lands Not Suited for Timber Production

RESPONSIBILITY: Zone Timber Personnel, Forest Timber Staff, District Rangers

DUE DATE: March 2, 1999

DATA SOURCE: NEPA Documents, Contracts, RIS data base

FUNDING/PERSONNEL: 30 person-days, \$6,000.

WATER RESOURCES

MONITORING REQUIREMENT: Water Quality Trend

RESPONSIBILITY: North and South Zone Hydrologists

DUE DATE: March 2, 1999

DATA SOURCE: Quantitative and qualitative field data collected and analyzed by professional and seasonal staff. Data collected is dependent upon the project type, monitoring objectives and statistical reliability required. Sampling and site selection is designed to facilitate extrapolation of data to other projects and areas.

FUNDING/PERSONNEL: Funding is spread across many projects. Monitoring not specifically funded by a project is funded through normal watershed management dollars. Monitoring is conducted by 1 GS-12 and 1 GS-9 hydrologist.

MONITORING REQUIREMENT: Water Uses

RESPONSIBILITY: North and South Zone Hydrologists

DUE DATE: March 2, 1999

DATA SOURCE: Bighorn Decree and on-site information. Handled on a case-by-case basis.

FUNDING/PERSONNEL: Funding is either through special use dollars or normal watershed management dollars on an as needed basis. Monitoring is conducted by 1 GS-12 and 1 GS-9 hydrologist. FACILITIES

WILDLIFE AND FISH

MONITORING REQUIREMENT: Sensitive Species Survey Work (including the water vole, lynx, wolverine, boreal owl, dwarf shrew, and goshawk)

RESPONSIBILITY: Forest Wildlife Biologist

DUE DATE: March 2, 1999

DATA SOURCES: Report from WGFD as a part of CCS agreement # 11214109410

FUNDING/PERSONNEL: Total project cost estimate = \$78,000 - Forest share = \$39,000 as a part of project management code 2611.

MONITORING REQUIREMENT: Wildlife Habitat Improvements - Forest Plan item

RESPONSIBILITY: Forest Wildlife Biologist

DUE DATE: March 2, 1999

DATA SOURCES: Information assembled for annual MAR Report

FUNDING/PERSONNEL: 1 person-day GS-12

MONITORING REQUIREMENT: Winter Range Carrying Capacity - Forest Plan item

RESPONSIBILITY: Forest Wildlife Biologist

DUE DATE: March 2, 1999

DATA SOURCE: Data sheets from seasonal Range and Wildlife Crew

FUNDING/PERSONNEL: 2 GS-5 seasonals - total project cost estimate = \$10,000.

MONITORING REQUIREMENT: Riparian Condition

RESPONSIBILITY: Forestwide Riparian Coordinator

DUE DATE: March 2, 1999

DATA SOURCE: Riparian, watershed, aquatic habitat, range, and wildlife field data collected on key monitoring areas/sites including functioning riparian, stream morphology, key aquatic habitat parameters, browse utilization, production-utilization transects, stubble height transects, photo points and other approved methods found in the Region 2 Analysis Handbook.

FUNDING/PERSONNEL: 60 days GS-7,9,11,12 (20 days range staff + 20 days GS-11 Aquatic Biologist + 10 days GS-12 Hydrologist + 5 days GS-9 Hydrologist + 5 days GS-12 Wildlife Biologist). Other miscellaneous riparian monitoring = 20 days (10 days GS-12 Hydrologist and 10 days Aquatic Biologist).

WILDERNESS

MONITORING REQUIREMENT: Wilderness Campsite Condition

RESPONSIBILITY: North and South Zone Recreation Coordinators

DUE DATE: March 2, 1999

DATA SOURCE: Modified Cole Campsite/Used site condition inventory.

FUNDING/PERSONNEL: .5 person year for Forest, GS-4-7s; and 2 person days, GS-11

VISUALS

MONITORING REQUIREMENT: Adopted Visual Quality Objective

RESPONSIBILITY: Landscape Architect/Districts

DUE DATE: March 2, 1999

DATA SOURCE: Management Reviews

FUNDING/PERSONNEL: 25 person days for Buffalo Bill Highway/GS9, 5 days for the rest of the Forest.