

Shoshone National Forest



Forest Plan

Monitoring & Evaluation

Report



Fiscal Year 2001

*Prepared by the
Shoshone National Forest
Planning Staff*

April 22, 2002

Dear Interested Party:

I have reviewed the Shoshone National Forest annual Monitoring and Evaluation Report for fiscal year 2001. Analysis associated with project implementation under the Forest Plan generally indicates that the Shoshone National Forest Land and Resource Management Plan (Forest Plan), as currently amended, is still valid and sufficient to guide implementation throughout the coming year.

One area that needs further direction is lynx management. The process of amending the Forest Plan for this was initiated in fiscal year 2001. The purpose of amending the Shoshone Forest Plan along with seventeen forests from regions 1, 2, and 4, and 18 Bureau of Land Management units in Idaho, is to incorporate direction for conservation of the threatened Canada Lynx per the Lynx Conservation Strategy and Assessment. Until that amendment is completed, the issue of lynx management is being addressed in each individual EA.

The monitoring plan also identified a number of areas that need to be addressed during the upcoming Forest Plan revision. Current Forest Plan direction is sufficient to address those items in the interim. Revision of the Forest Plan is scheduled to begin in 2004.

/s/ Dave Cowise for
REBECCA AUS
Forest Supervisor

attachment: 2001 Monitoring Report

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Forest Plan Budget

Actual Costs of Applying Management Direction from the Forest Plan

This monitoring item was designed to track the actual cost of implementing the Forest Plan. It is useful for verifying assumptions made in the Plan and allows the Forest to note trends in changes in expenditures in any given resource area. The budget level necessary for implementation of the mix of goods and services projected in the 1986 Forest Plan was an estimate. It projected average annual expenditures between 2001 and 2010 of approximately \$11.7 million (2001 dollars).

Actual expenditures are reviewed annually and compared to Forest Plan projections. This is somewhat of a challenge given the many changes that have occurred in the budgeting process since the Forest Plan was published. Changes include combining or splitting out fund codes used to track dollars allocated to a particular resource program and modifications to the way expenditures are tracked. The figure below compares projections made in the Forest Plan to actual costs for 2001 using the most current fund codes.

Evaluation

The total 2001 expenditures for the Shoshone National Forest represent approximately 70 percent of Forest Plan projections. 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.

In fiscal year 2000, the Forest Service converted to a completely new accounting tool. The Foundation Financial Information System (FFIS) replaces all previous accounting systems. In addition, a change to how project funds are expended has been implemented through the Primary Purpose Principle. Several budget line items will require significant adjustment because of Primary Purpose. These changes will make it difficult, if not impossible, to compare current expenditures with Forest Plan projections. In the future, this monitoring item will have to be addressed qualitatively.

Figure 1. Comparison of FY 2001 Expenditures to Forest Plan full implementation budget (thousands of 2001 dollars)

Cost Center and Cost Center Components	Fund Codes	Fiscal Year 2001 Expenditures	Forest Plan
Planning, Inventory and Monitoring			
Inventory/Monitoring	NFIM	897	1,036
Land Management Planning	NFPN	167	109
Recreation Mgmt			
Heritage, Recreation Wilderness	NFRW	1,324	1,538
Cooperative Work	CWFS	41	89
Wildlife and Fish Management			
Wildland Habitat Mgmt, Anadromous Fish, Inland Fisheries, TE Adm	NFWF	687	1,081
Rangeland Management			
Range NFS	NFRG	252	573
Range Betterment	RBRB	14	89
Forest Products			
Timber Sales Mgmt	NFTM	784	539
Salvage Timber Sales	SSSS	17	122
Timber Cooperative Work	BDBD	1.7	26
Vegetation and Watershed Mgmt			
Vegetation Mgmt; Range Vegetation Mgmt; Soil and Water Improvements; Soil, Water, Air Ops.	NFVW	814	873
Physical Resources			
Minerals Mgmt	NFMG	63	243
Landownership Mgmt	NFLM	192	204
Land and Water Acquisition	LALW	0.526	34
Infrastructure Management			
Facilities Maintenance and Improvements	CMFC	596	486
Road Maintenance and Improvements	CMRD	661	1030
Trails Maintenance and Improvements	CMTL	368	821
Law Enforcement			
Law Enforcement	NFLE	40	28
Wildland Fire Mgmt			
Hazardous Fuels Reduction	WFHF	50	381
Preparedness and Fire Use	WFPR	1,316	1,024
General Administration			
General Administration	NFGA*	Not a separate fund	1,462
Grand Total		8,285	11,788

* General administration dollars are no longer a separate fund but are distributed throughout the other funds

Recreation

Introduction

In 2001, the Shoshone National Forest continued to emphasize inventory of trail and recreation assets. For the first time, a contract was issued to conduct trail inventory using GPS and GIS technology. Demands of trail and recreation management exceed the number of trained employees available on the Forest to administer the program on the ground.

A major effort was made to identify potable water management challenges and improve testing. Due to drought and aging conditions of water systems, several water systems on the Forest were shut down, some permanently. This trend to improve efficiency of recreation facility management and reduce cost will continue. The Forest will continue to focus on field presence of qualified personnel to ensure visitor safety, ensure compliance with food storage regulations, and respond to visitor demands for our presence in developed and undeveloped recreation locations.

Priorities were:

- To continue deferred maintenance condition surveys for all facilities, and continue entering inventory and condition data into Infrastructure and Meaningful Measures databases.
- To protect the health and safety of Forest visitors and prevent bear/human conflicts.
- To protect the threatened grizzly bear by providing high levels of information, education, interpretation, monitoring, and compliance relative to the bear.
- To keep all administrative sites and public recreation facilities safe, clean, and well maintained. The Forest continues to seek opportunities to reduce the operation cost of developed sites and will continue to seek solutions to providing potable water at developed sites.
- 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 and outfitters to provide public safety, land stewardship, and high quality value-added visitor services (including education and interpretation). The focus on agency provided education and information programs has been reduced; there is now emphasis on recreation permittee's using trained employees to provide information to forest users.

Monitoring was integrated into all aspects of fieldwork. In addition the Shoshone National Forest continued work on several nationwide Forest Service initiatives designed 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 was continued and includes trails in addition to recreation facilities.

Dispersed Recreation

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 traveling on snow where permitted. Off-highway vehicle (OHV) use both nationally and on the Shoshone National Forest is increasing at a noticeable rate. Off-road vehicle impacts and snowmobile use were monitored and addressed.

Snowmobile use data is being collected with the assistance of the State of Wyoming. The Forest began monitoring snowmobile use in concert with Greater Yellowstone Coordinating Committee requirements. The primary focus of the first year of monitoring was on the South Zone of the Forest (Washakie and Wind River Ranger Districts) due to personnel shortages on the North Zone (Clarks Fork, Greybull and Wapiti Ranger Districts).

Monitoring revealed that low snow depths caused a decrease in snowmobile use on both the South and North Zones. Drought conditions shortened available seasons and reduced overall use. One wilderness snowmobile trespasser was discovered during monitoring flights and prosecuted in cooperation with the Bridger-Teton National Forest. The prosecution was successful and well publicized. This case and its notoriety will raise awareness of wilderness travel restrictions and locations. The Forest added supplemental wilderness signs in areas of snow play on both zones to improve public awareness of the location of wilderness.

Evaluation

On the Clarks Forks Ranger District the following continue to be problem areas: Morrison Jeep Trail, Fantan, and the Lily Lake trails. Monitoring continues to indicate an overall increase in OHV use on the Clarks Fork Ranger District.

OHV use continues to increase on the Greybull Ranger District. Forest personnel on the Wapiti Ranger District monitored OHV use through visual observation, photography, violation notices, and incident reports.

On the Forest's South Zone district personnel are now working closely with the State of Wyoming to develop a system of OHV trails. A state OHV registration program is being proposed in the state legislature and expected to pass in some form. This program would provide additional funding through the state for OHV management. The Forest will continue to work with the state to designate existing routes as a way to provide OHV opportunities and reduce use off road and off trail.

Overall, increased emphasis and planning for OHV use is needed on the Forest. Use continues to expand into areas not previously impacted and resource impacts are becoming evident. Though the Forest receives the same impacts experienced by other national forests and jurisdictions across the west, OHV use is increasing at a rate that will make management of this use a primary issue in future years.

2. Dispersed Campsite Condition

In 2001, approximately 65 percent of dispersed sites on the north end of the Forest were monitored. Dispersed sites along roads were monitored more frequently than backcountry sites. On the South Zone of the Forest, most of the dispersed sites were visually monitored. Conditions that were not to standard were corrected.

Evaluation

Dispersed campsite issues remain, but are not increasing beyond those of past years. Primary focus of dispersed site management is in wilderness on the Forest.

Developed Recreation

1. 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.

Evaluation

In general, use of developed sites appears to be stable. Although overall visitation seems to be increasing, overnight use appears to have increased slightly. Closure of water systems in developed sites and restructuring of fees charged for developed sites make use levels more difficult to compare to previous years. Ten percent more fees were collected in 2001. Given that fewer developed sites with water were available and that lower fees were charged for those sites, overall use may have increased more than 10 percent indicated by the total of fees collected. Completion of the North Fork Highway construction also contributed to a modest increase in use late in the season of 2001.

2. Developed Site Condition

The US Forest Service operated all but two campgrounds on the Shoshone National Forest in 2001. A new campground was constructed on the North Zone but not opened for use this season. A concession continues to operate developed campgrounds on the Washakie Ranger District.

A major effort to inventory deferred maintenance needs for facilities continues. Assessment of recreation facilities, as well as costs to bring facilities up to standard, will be occurring over the next five years.

Evaluation

Written public comments indicate that in general, the public feels campground facilities on the Forest 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. Despite the heavy use these sites receive, soil and vegetation condition is generally good.

All campground facilities in the North Fork corridor of the Wapiti Ranger District are planned for upgrading and retrofitting during the next decade. Rex Hale Campground was completed in 2001 and will be opened to the public in 2002. Eagle Creek Campground was contracted for reconstruction in 2001 and will be completed in 2002. Use of developed sites in this corridor remained comparatively low as road construction activity impacted visitation and overnight stay levels until late in the season. Several hand pump wells were upgraded under the Deferred Maintenance investment program, which is specially funded by Congress to reduce the maintenance backlog.

The campground facilities on the South Zone of the Forest are in poorer condition than those on the North Zone. The Louis Lake campground on the Washakie Ranger District, for example, continues to receive heavy use with subsequent resource impacts to the campsites and surrounding area. Major rehabilitation and/or reconstruction are needed. The water system in the Sinks Canyon campground requires constant maintenance. Additional capital investment funds are needed to upgrade these facilities and initial work

will begin planning upgrades in 2002. Several water systems on the South Zone were identified as deficient and may be closed or scheduled for improvements in future years.

3. Downhill Skiing Use

Sleeping Giant Resort is the primary downhill ski area on the Shoshone National Forest. It is located on the Wapiti Ranger District and can accommodate approximately 1000 skiers per day.

The following displays use at Sleeping Giant for the past six years.

Figure 2. *Skiers per month at Sleeping Giant Ski Area*

Season	December	January	February	March	April	Total
1995/96	964	1,679	1,280	1,241		5,154
1996/97	1,002	1,313	1,295	830	88	4,528
1997/98	366	1,243	1,020	697	64	3,390
1998/99	599	1,883	1,477	610		4,569
1999/2000	840	1,855	1,260	590		4,545
2000/01	830	851	1,207	498		3,386

Evaluation

The Sleeping Giant Resort reports lift ticket sales at the end of the operating season. Downhill skier use figures reported for the 2000/01 operating season demonstrate a significant decline in use over previous years. The decline occurred in the month of January most likely due to a lack of snow.

The Red Lodge Race Camp, located on the Clarks Fork Ranger District, typically offers a summer program for training ski racers. This area did not operate in 2001 due to a lack of snow.

The Forest Plan recommends reevaluation when use exceeds managed capacity for three years. Use at the downhill ski areas located on the Shoshone National Forest should continue to be monitored and the public need for these facilities evaluated when the Forest Plan is revised.

Trails

1. Trail Condition

Summer/Fall Use Trails

Trail condition is monitored annually on the Shoshone National Forest. In 1999 the Forest Service began an inventory of assets. In response to the requirements of the inventory policy, approximately 20 percent of the trails on the Forest are inventoried for deferred maintenance needs annually. At the end of fiscal year 2001 approximately 55 percent of the Forest's 1,388 miles of trail had been inventoried. Data was entered into appropriate databases and written records.

The Forest let a trail inventory contract in an effort to increase the percentage of trails inventoried. Work on this contract will be completed in 2002. The priority on the Forest pertaining to trails management continues to be deferred maintenance condition surveys. These surveys are the essence of very detailed inventory and monitoring of existing conditions and needs.

The Forest Plan calls for maintenance of trails that provide a full range of recreation opportunities. It also states that design and maintenance of trails should be appropriate for the intended use. Throughout the Shoshone National Forest, a very wide range of recreation opportunities is available relative to the trail system and management objectives, ranging from challenging foot travel to motorized uses. The majority

of trails on the Forest are currently constructed and maintained to be compatible with the intended use. The only exceptions are those trail segments outside wilderness that were not intended for motorized use.

The introduction of ATVs during the last decade and the tremendous increase in their popularity have resulted in the motorized use of many primitive trail segments not designed for motorized travel. Resource damage is occurring as a result.

In 2001 emphasis was placed on increasing reconstruction of unsafe trail sections and reduction of the level of light maintenance. User and outfitter clearing of trails were emphasized in wilderness to allow the Forest to focus on heavy maintenance and reconstruction needs. This trend is expected to continue as outfitters and user groups such as the Back Country Horsemen are becoming more interested and active in light trail clearing projects.

2. Structures

All bridges are still serviceable and safe, but due to age some may need replacement in the near future. Currently, two bridges with a high priority for replacement are the Cut Coulee Bridge and the Red Creek Bridge, both on the Wapiti Ranger District.

The Forest's South Zone trail program has placed a greater emphasis on structures. Therefore puncheon sections are maintained to a higher degree than on the North Zone. Puncheons continue to be a major challenge to the goal of maintaining trails to standard in granitic areas of the Forest. On the North Zone of the Forest four unserviceable puncheon sections in the upper North Fork of the Shoshone River, North Absaroka Wilderness, were replaced through a deferred maintenance contract.

In addition to the absence of structures where needed, the major problem in the Beartooth Mountains on the Clarks Fork Ranger District is the deteriorated condition of many existing drainage and retaining structures. Several high hazard "cat walk" sections of trail were inventoried and readied for improvement in 2002 and future years as funding becomes available.

Identification of deferred maintenance needs through inventory will help the Forest establish priorities for repair and reconstruction. Mass failures occurred on the Whiskey Mountain Trail on the South Zone of the Forest, effectively closing that route. The Whiskey Mountain Trail was relocated, designed, and staked in preparation for reconstruction when funds become available. All other failures of trail tread or structures that could pose a major safety threat to the public were repaired during the field season.

The lack of adequate drainage structures forestwide, in conjunction with minimal maintenance/installation, has resulted in a less than satisfactory condition of drainage structures.

Evaluation

Meeting public expectations for acceptable levels of trail maintenance continues to be a problem for the Shoshone National Forest, given the extensive miles of trail in the system. Although many areas still need maintenance, there are many miles of trail at an acceptable standard. Analysis of deferred maintenance inventory data is helping the Forest prioritize trail safety problems and plan repairs as funds become available. The Forest continues to receive positive comments from users on the relatively good condition of its trails in comparison to adjoining forests.

Use of motorized vehicles on trails, both where permitted and in many areas where restricted, is expanding rapidly as observed by patrol personnel and on the ground impacts.

In terms of winter use, monitoring on the Clarks Fork Ranger District indicates increasing snowmobile use. Winter trail use by cross country skiers, snowshoe users, and others continues to be a minor but noticeable use.

On the Forest's South Zone, evaluation of data collected from nine infrared counters along snowmobile trails was completed by the State of Wyoming's Department of Commerce. Monitoring continued into its

third year. Baseline data is just now becoming available from this effort. Trends in use will become evident in the next few years as the state program continues.

Reduction of winter wilderness snowmobile trespass has been improving on both zones because of patrols, well-publicized convictions of offenders, and increased signing of wilderness boundaries for winter recreation. A small percentage of snowmobilers continue to trespass.

The Shoshone National Forest continues to be 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. A formal monitoring program was begun in 2001 and will continue, as funding is available.

Wilderness

1. Wilderness Campsite Condition

Wilderness campsite inventory is essentially complete but data transfer to GIS formats continues. Most sites within wilderness have been identified and mapped.

Evaluation

Wilderness rangers have identified problems related to food storage structures, and the Forest has initiated a policy review team to deal with that issue. A decision on food storage orders and accepted methods was made in 2001 based on the inventory feedback from wilderness rangers, input from outfitters and other agencies. The Forest will work in concert with the Bridger-Teton National Forest and expand the Food Storage Order forest-wide in 2002.

2. Other Wilderness Monitoring

Monitoring continues in the Forest's five wilderness areas to determine whether they are being managed to standard; this amounts to meeting at least six out of nine wilderness management criteria, including wilderness fire plans and air quality monitoring. Based on current and previous monitoring efforts, the Forest estimates that 1,024,000 out of 1,400,000 acres meet Forest Plan standards for wilderness. That area is an estimate of the acreage in pristine condition. Additional evaluation in future years may show that more acres meet Forest Plan standards.

A vigorous noxious weed inventory, monitoring and control program for wilderness began in fiscal year 2000 and continued in 2001. The primary focus was in the South Fork of the Shoshone River drainage on the north zone of the Forest and the Double Cabin area on the south zone. Primary species of concern include toadflax and houndstongue. Sprayers brought in on horseback were used to treat toadflax infestations in the South Fork of the Shoshone River drainage on lands adjacent to and within wilderness. New wilderness rangers were trained in identification of noxious weed species and they have contributed two seasons of monitoring for weeds. Two volunteers were used to inventory wilderness sites for noxious weed infestations.

Wilderness rangers on patrol in wilderness areas made approximately 2,000 contacts. Education is focused on in-the-field contact with users because many are repeat visitors to the Forest. This approach has allowed the Forest to combine wilderness education with efforts to monitor wilderness, maintain trails, and enforce the law. The Forest continues to hire a field-trained wilderness ranger workforce for these purposes.

Evaluation

Wilderness areas on the Shoshone National Forest are in good condition, overall. A future challenge will involve successful implementation of wilderness fire plans. In addition, invasion by exotic weed species is a potential threat to wilderness ecosystems. The Forest is placing additional emphasis on weed-free feed programs and may need to devote additional resources to the noxious weed program. This will depend on the results of monitoring current activities aimed at stemming noxious weed invasions.

Campsite inventory and visitor contact efforts have been very successful in achieving high levels of awareness among the Forest's wilderness users about *Leave No Trace* principles and grizzly bear behavior. High mortality of bears in 2000 and 2001 indicate that additional work is needed with the hunting community and outfitters as this is the season when most bear/human encounters have resulted in grizzly mortality. The high level of one-to-one field contact by wilderness rangers on the Forest continues to be the cornerstone of wilderness management for the Shoshone National Forest.

Visuals

Adopted Visual Quality Objective (VQO)

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

VQO are monitored at the project level and achieved through project implementation. 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 through site specific analysis it is determined that the VQO is inappropriate for the project area it may be changed through a Forest Plan amendment. Second, if visual analysis indicates 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.

In fiscal year 2001, the North Fork Highway Reconstruction project was monitored for consistency with Forest Plan VQO. Construction was monitored weekly to ensure that roadway design conformed to the VQO of retention. The following project features on the Wapiti Ranger District were reviewed and found to meet retention visual quality objectives.

- Rex Hale campground construction and revegetation work.
- Rehabilitation of reclaimed borrow site. It was reshaped and planted to natural appearing forms.
- Half-cast drill marks from previous blasting (vertical half-tubing appearance on rock cut faces did not appear natural). A track-hoe grading machine rescraped tubes and reshaped cut slopes to eliminate blast tube vertical lines in cut slope rock faces.
- Signs (interpretive and informational) were selected and installed to provide necessary information and blend with the natural environment (backs of signs were painted a dark color to minimize visual impact).
- Vegetation. Seeding and direct stock planting of native species were accomplished.
- Rock masonry was utilized where possible to blend structures with the natural appearing landscape and historical forms of construction.

Evaluation

The Forest's Landscape Architect transferred to a new position in fiscal year 2001. Her replacement was hired in October of 2002 and had very little opportunity to monitor fiscal year 2001 projects for VQO. District personnel monitored the North Fork Highway Reconstruction project mentioned above for visuals. It is expected that the visuals monitoring will be resumed in fiscal year 2002.

Cultural Resources

Introduction

The role of the cultural resource program is to provide stewardship for the prehistoric and historic resources located on the Forest. The cultural resources program includes site protection, investigation, interpretation, and public education to enhance and protect irreplaceable assets.

A major component of the cultural resource program is to provide input into projects that occur on national forest lands. The process involves ensuring compliance with Section 106 of the National Historic Preservation Act.

Another part of the process is interdisciplinary participation on National Environmental Policy Act (NEPA) analysis for projects occurring on the Forest.

1. Compliance with Cultural Resource Regulations

The Forest worked through many issues of compliance with cultural resource regulations in 2001. In coordination with the State Historical Preservation Office (SHPO), a program was developed and implemented to help the Forest comply with cultural resource regulations. The following activities are aimed at compliance with section 106 of the National Historic Preservation Act.

Approximately 16,000 acres of the Forest were inventoried for the prescribed fire program. Associated with these acres, 10 sites were recorded and evaluated. Currently, there are an additional 37,000 acres under contract for the range permit reissuance effort that will continue into 2002.

Evaluation

A remedial plan was developed jointly with the State Historic Preservation Office (SHPO) and was implemented. The Forest addressed all of the issues outlined in the plan and will continue to work toward full compliance with cultural resource regulations in coordination with SHPO.

Annual meetings are occurring between the Forest Service and SHPO to review progress toward full compliance. The Forest Service Rocky Mountain Region is also working on a uniform protocol for all forests within the region to use when interacting with SHPO.

2. Protection of Properties Eligible for the National Register

In fiscal year 2001, 56 sites were evaluated for National Register eligibility and two sites were interpreted for the public (signs were installed and information posted). One site was nominated for the National Register (Clay Butte Fire Lookout). Site visits occurred and site condition was assessed at eight sites (listed below) on the National Register of Historic Places. Approximately 50 sites were evaluated for National Register of Historic Places eligibility.

Figure 3. Cultural sites monitored in FY2001

Site Name	National Register Eligibility	Status and Recommendation
Mummy Cave	Listed	New highway construction bypass site. Continue monitoring ¹
Dead Indian Campsite	Listed	No change in condition observed.
Lookingbill	Concurred Eligible	No change in condition observed, use by dispersed campers.
Kirwin Town Site	Concurred Eligible	No change in condition observed.
No Name Assigned	Unevaluated	No change in condition observed.
Wapiti Ranger Station	National Landmark	Maintenance and upgrades occurring.
Double D Ranch	Concurred Eligible	Management plan development in progress.
Clay Butte	Nomination in Progress	

¹ The north wall of the block excavation conducted at Mummy Cave in the early 1960s is experiencing rill erosion. The southern extent of the block excavation is pock marked from visitors gouging into the wall. No artifacts or features were observed at the site. The site should continue to be monitored to see if additional artifacts or features are being exposed by disturbances of the unexcavated portions of the rock shelter.

Evaluation

It is recommended that monitoring of eligible sites continue to ensure no long-term degradation is occurring at listed sites (National Register of Historic Places) on the Forest. Also as more properties are nominated to the list, more emphasis needs to be placed on monitoring these sites.

Additional Monitoring Efforts

Per a Memorandum of Understanding (MOU) with the SHPO, the Forest agreed to perform visual examination of areas identified as having high potential for heritage resources and high probability of impacts associated with livestock grazing. A concerted effort was made to examine these areas to ensure that the terms of the MOU were being followed. This effort was very successful in that many areas were examined and inspected. The Forest will continue this effort.

Forest personnel gave five archeological presentations. In cooperation with Wyoming SHPO, the Forest also conducted a structural stabilization project at the Kirwin historic site with the help of volunteers.

In an effort to place more emphasis on cultural resource management, agreements with Northwest College, the Dubois Museum, and the Buffalo Bill Historical Center are being developed and implemented. These agreements will increase the personnel available to monitor and protect historic and prehistoric resources on the Shoshone National Forest.

Proposed, Threatened, Endangered, and Sensitive Species

1. Known Human-Caused Grizzly 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 and probable 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. Mortalities tied to recovery objectives are counted in the Grizzly Bear Recovery Area and within 10 miles outside. Methods for estimating populations and calculating mortality limits are documented in the Recovery Plan. All grizzly bear recovery information is reported annually for the GYA in the Annual Report of the Interagency Grizzly Bear Study Team (IGBST). Annual reports are generally available by May of the following year and can be accessed under 'bear links' at the following web site <http://www.fs.fed.us/r1/wildlife/igbc>. The Forest participates in gathering and compiling information presented in the IGBST annual report.

Sixteen known and probable grizzly bear mortalities were documented in the GYA in 2000 and 19 in 2001. Three of the 2000 and eight of the 2001 mortalities were females. Specific locations and causes of these mortalities are documented and summarized for the Shoshone National Forest in the 2000 and 2001 IGBST reports.

Evaluation

Grizzly bear mortalities in the GYA were much higher in 2000 and 2001 than in the previous four years. However, the six-year running average for both years was below mortality thresholds identified in the Recovery Plan. Hunter related mortalities constituted the largest percentage of grizzly mortalities in 2000. In response, the Yellowstone Ecosystem Subcommittee (YES) organized a task force to evaluate the causes and develop strategies to reduce the level of hunter related mortalities. The Shoshone National Forest was part of that task force. Few hunter related mortalities occurred in 2001. Most mortalities in 2001 were related to bears obtaining human food, many on private land outside Forest boundaries. The Shoshone National Forest is proposing to expand the Food Storage Order to the entire Forest in 2002. The Bridger-Teton National Forest is also considering the expansion of the Food Storage Order to many new areas of that Forest in 2002. *See* discussion on the Food Storage Order in the 1998 monitoring report.

2. Compliance with Grizzly Guidelines

The two main components of the Grizzly Guidelines are to maintain and improve habitat, and minimize the potential for or resolve grizzly bear/human conflicts. The 1998 Forest monitoring report discussed the main elements of the Forest program designed to achieve the above objectives and how these have contributed to the remarkable progress toward grizzly bear recovery on this Forest. The reader is referred to that report for background information and perspective. Items monitored in 2001 relative to this element included biological evaluations prepared, conflict reports, and public education efforts.

All grizzly bear/human conflicts, confrontations, and management actions for the entire Yellowstone Ecosystem have been published annually since 1993. Beginning in 1999 the conflict report has been incorporated into the Annual Report of the Interagency Grizzly Bear Study Team (IGBST). Specifics on the number, location, cause and suggested solutions for grizzly bear/human conflicts occurring on the Shoshone National Forest can be found in the 2000 and 2001 IGBST reports. See the section on grizzly bear mortality in this report for information on how to access IGBST reports.

Evaluation

Fourteen biological evaluations were completed in 2001 to determine the effects of proposed actions on grizzlies and their habitat on the Forest and to assist in the ultimate recovery and delisting of the species. Forest biologists and other personnel met regularly with biologists and personnel from other federal and state agencies with shared responsibilities for this species to review proposed actions and consider alternative courses of actions and associated consequences for the grizzly. As in previous years, grizzly bear clauses, as appropriate, were updated and included in special use permits, domestic livestock grazing permits, and contracts for other activities in grizzly bear habitat on the Forest.

Efforts to minimize or resolve grizzly bear/human conflicts were a high priority as always. Numerous public education outreach efforts were carried out in cooperation with other forests and agencies in the GYA. Some of these efforts included education and enforcement of the Special Order requiring food attractants be kept unavailable to bears, dissemination of literature and personal contacts at Forest offices, trailheads, campgrounds, the Wapiti Information Center, Clay Butte Information Center, inspections of guest lodges and summer homes, safety presentations for organized groups, and participation in the Living in Bear Country Workshops.

As noted in the section on grizzly bear mortality, the Shoshone National Forest is considering the expansion of the Food Storage Order to the entire Forest in 2002. The Food Storage Order has proven to be very effective in reducing grizzly bear/human conflicts and bear mortalities.

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. Data from various monitoring efforts, as well as professional judgments, are used to assess overall habitat effectiveness for the entire Forest and for specific projects.

The 1998 monitoring report identified various parameters that were being monitored, in cooperation with the Yellowstone Ecosystem Subcommittee, to evaluate habitat effectiveness. Parameters identified in that report are still relevant and are monitored and reported for the GYA and the Shoshone National Forest in the IGBST annual report. However, in 1999 draft habitat-based recovery criteria for inclusion in the Recovery Plan were developed and in 2000 the Draft Conservation Strategy for the Yellowstone Grizzly Bear was completed that included the same habitat criteria. The forests in the GYA have agreed in concept to a no net loss of habitat within the Grizzly Bear Recovery Area which these draft criteria attempt to represent. These draft habitat criteria parameters are being used to monitor habitat conditions pending the finalization of habitat criteria in the Recovery Plan and the Conservation Strategy. The Recovery Plan is relevant while the bear is listed as a threatened species whereas the Conservation Strategy will apply when the bear is de-listed.

The habitat criteria are based on a 1998 baseline of habitat conditions within each of the 40 Bear Management Subunits within the Recovery Area and summarized below. *See* the Draft Conservation Strategy for the Yellowstone Grizzly for the complete description of the details of the habitat criteria. The 1998 IGBST report provides additional information on the Access Model methodology and presents the 1998 motorized access route density and secure habitat baseline. *See* the section on Grizzly Bear Mortality in this report for information on how to access the IGBST Annual Report.

1. No increase in the percent of open motorized access route density greater than one mile per square mile in each of two identified seasons. A temporary one percent increase allowed.
2. No increase in the percent of total motorized access route density greater than two miles per square mile in each of two identified seasons. A temporary one percent increase allowed.

3. No decrease in the percent of secure habitat in each of two identified seasons. A temporary one percent decrease allowed.
4. Subunits will be managed so there will be no likelihood of detrimental impact to grizzly bears due to increases in the number of developed sites or expansion of existing sites on public lands. Potential impacts must be mitigated.
5. Inside the recovery area, no new allotments created. No increases in permitted sheep AUM (animal unit months). Existing sheep allotments will be phased out as the opportunity arises.

Evaluation

All Recovery Plan population parameters for the ecosystem were met in 2000 and 2001. The habitats on the Forest contributed significantly to meeting these targets and to the overall goal of grizzly bear recovery. Specific numbers of females with cubs of the year and female with cub occupancy on the Forest are included in the 2000 and 2001 IGBST reports. The Access Model has not been run ecosystem wide since the evaluation of the 1998 baseline pending the finalization of the habitat criteria. However, it has been used to assess proposed projects on the Forest to ensure compliance with the draft habitat criteria. No new roads have been built in the Recovery Area that would result in an increase in motorized access route density. Several roads have been closed or obliterated within the Recovery Area since 1998 that would result in a decrease in motorized access route density and an increase in secure habitat over the 1998 baseline. There have been no increases in site development that were not mitigated to ensure no detrimental impact to grizzly bears, and no new livestock allotments or increases in sheep AUM. A continuation of the expansion of bears into new areas and apparent increases in population size and reproduction on the Forest also suggest relatively high habitat effectiveness in and out of the Recovery Area.

4. Wolf Population Status

Fourteen gray wolves were reintroduced into Yellowstone National Park in January 1995 from Alberta, Canada. The following year 17 additional wolves from British Columbia were added to the reintroduced population. These animals and any other native wolves that might have remained in the Greater Yellowstone Area (GYA) have been classified as a “non-essential experimental” population, as per provisions of the Endangered Species Act, which provides for additional management flexibility.

The U.S. Fish & Wildlife Service (FWS) and the National Park Service (NPS) monitor wolves with assistance from other agencies, groups, and individuals as circumstances will allow. Shoshone National Forest personnel maintain contact with these agencies, and use other information sources as well, regarding the status, location, and activities of wolves on or near the Forest. Weekly reports from the FWS on the status of wolves in the Rocky Mountain area as well as the 2000 and 2001 Rocky Mountain Wolf Recovery Annual reports are posted on the FWS’s Region 6 Internet site www.r6.fws.gov/wolf/index.htm.

Evaluation

In December 2001, at least 70 wolves (54 wolves in six radio collared packs and 16 wolves in three uncollared or suspected packs) were present in Wyoming outside of Yellowstone National Park (YNP). Four of these packs (Beartooth, Sunlight, Absaroka, and Washakie) have been using areas primarily on the Shoshone National Forest since at least 2000. An additional pack (Greybull River) formed and began using areas on the Greybull River on the Forest in 2001. Another suspected pack of four to five wolves is using areas on the Wyoming border near Red Lodge. Mollie’s Pack, whose home range is primarily in Yellowstone, occasionally uses areas in the upper North Fork of the Shoshone River drainage on the Forest.

The Sunlight, Beartooth, Absaroka, and Washakie packs all had pups in 2001. It is unknown if the Greybull River pack or the suspected pack near Red Lodge had pups in 2001.

Three of these packs were documented killing livestock or pets in 2001: Sunlight (two calves), Absaroka (eight calves, one dog) and the Washakie (two calves, one dog). Attempts were made by the FWS to control wolves in the Absaroka and Washakie packs. One wolf was removed from the Absaroka Pack and one pup was captured, radio collared and released. Attempts to lethally control wolves in the Washakie pack were unsuccessful with one radio-collared pup recaptured and released on site.

For more information see the 2001 Rocky Mountain Wolf Recovery Annual Report.

5. Nesting Peregrine Falcons

Although the peregrine was removed from the Endangered Species List in 1999, the Shoshone National Forest will continue to cooperate with the Wyoming Game and Fish Department (WGFD) to monitor this species on the Forest. In 2001, WGFD monitored the following items related to peregrines: number of nest sites, number of nesting pairs, nesting success, and production for the entire Shoshone National Forest (SNF) area.

Evaluation

There were eight occupied peregrine nests discovered on the Shoshone National Forest in 2001. These nests were located in the following areas: Warm Springs, Beartooth Creek, Sunlight, Dead Indian, Logan Canyon, Boulder Creek, Arrow Mountain, and Wolf Point. In total, at least 15 fledglings were produced from these eight nests, and possibly two more that had not yet fledged at the last nest check. Nests in 2001 produced at least 1.9 young per pair. People involved in monitoring nests believe there are more nesting peregrines than are found during the surveys. Surveyors are not always able to access the good nesting ledges, and when they check ones that have not been checked for a few years, they most often find nesting birds there. This trend appears to be stable over the last several years.

6. Nesting Bald Eagles

The bald eagle remains on the list of threatened species, even though the U.S. Fish and Wildlife Service has proposed delisting it. 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. Nesting surveys on the Shoshone National Forest have been conducted annually for the past several years as part of Wyoming statewide surveys.

Evaluation

The annual surveys conducted in 2001 did not detect any current nesting by bald eagles on the Forest. However, three pairs of eagles nest close to the Forest boundary. The Dunoir pair, which has in the past nested on the Forest, nested close to the Forest boundary. The productivity of this nest is unknown. A nest on the Buffalo Bill Reservoir produced three fledglings. The third nest at Ring Lake failed. Throughout the state of Wyoming and in the Greater Yellowstone Area the number of nesting pairs has increased dramatically in the past 20 years.

7. Lynx

The Forest continued to implement its portion of the national lynx protocol that it began in 1999. This involves putting out hair snare pads with attractant (such as catnip) at intervals along the grid to entice a cat to rub on the pad, leaving a hair sample. These samples are collected and sent in for DNA analysis. In 2001, the Dubois survey (grid #2) was conducted for the third time, and the second year was run on the grid in the Beartooth area (grid #33). The hair sample pads on the Dubois grid were also in place over the winter of 1999-2000 so additional samples were submitted from that grid in 2000.

Evaluation

Because of the length of time it takes to receive the results of the DNA analysis, the 2000 results for grid #2 were received in 2001. There was no evidence of lynx presence detected from samples submitted. The Forest has not yet received 2001 DNA results. The 1999 samples from the Beartooth grid contained two

different pads with lynx hairs on them. These results were received late enough in the 2000 fiscal year that money was not available to run the grids in 2000. Sampling the Beartooth grid was a high priority in 2001. Results from the DNA analysis has not been received as of this writing.

The evidence of lynx in the Beartooth area has resulted in further analysis of future projects in that area to determine what effects these projects may have on lynx and lynx habitat. The Beartooth highway project, for example, has been examined for potential lynx crossing areas and ways to preserve those areas when the highway is reconstructed. Also, money is being allocated to snow tracking surveys in this area to look for further evidence of lynx.

8. Sensitive Plants

The Botany-Sensitive plant program on the Forest continues to have a low emphasis due to funding. Monitoring occurred mostly in conjunction with proposed projects.

New populations of Absaroka golden weed were found in the Rattlesnake drainage. Documentation of pink agoseris assembled by consultants working on the Beartooth Highway Reconstruction environmental analysis provides the Forest an assessment of populations on the Beartooth Plateau. Consultants also found new locations of this plant in the Brooks Lake area.

Qualitative monitoring of Round-leaf orchid populations occurred at the Swamp Lake Botanic Special Interest Area (SIA). The fence constructed in conjunction with the new boat dock east of the K Bar Z Ranch in the Crandall Area (Clarks Fork Ranger District) is keeping human and livestock traffic away from one of the larger populations of this sensitive species. Livestock use at the south end of the SIA continues to be a problem due to trampling.

Evaluation

It is recommended that the Forest begin a sensitive plant species population monitoring program. This will occur after the Regional (Forest Service Rocky Mountain Region) Viability Assessment Team completes sensitive plant species assessments. The Forest will use these assessments as a basis to begin population monitoring.

In fiscal year 2002, the Forest will recommend that pink agoseris be removed from the regional sensitive plant list. Since its placement on the list, widespread populations of this plant have been documented in the Northern and Middle Rocky Mountains.

A contract was initiated in early fiscal year 2002 with Dr. Richard Scott, a Botanist with Fremont County Weed and Pest, to complete a forest wide plant list and to teach plant and plant community identification with Kent Houston. The plant list will provide the Forest baseline data for any monitoring project involving plant identification.

Monitoring of livestock disturbance within the Swamp Lake SIA will continue.

Wildlife and Fish

1. Winter Range Carrying Capacity

The Forest was unable to accomplish monitoring for this item in 2001. There were three primary reasons: insufficient funding to hire wildlife seasonal employees; focusing on higher priority work items, such as lynx monitoring; and turnover in biologist staff.

2. Wildlife and Fish Habitat Improvements

Wildlife Habitat Improvements

In fiscal year 2001 several activities were monitored for habitat improvement accomplishments. The number of forestwide acres treated for noxious weeds, acres of sagebrush and conifers burned, and acres planted to reestablish cover and provide forage were tracked.

Evaluation

In 2001, 1,500 acres of noxious weeds were treated on the Shoshone National Forest to increase native plant species and improve desired habitat conditions and diversity. Approximately 3,134 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. Five hundred and fifty acres of whitebark pine seedlings were planted to restore this community and benefit grizzly bears. Similar quantities of habitat improvements are anticipated for fiscal year 2002.

Fish Habitat Improvements

The current Forest Plan has little specific direction related to the management of fisheries habitat. Indirect inferences are made in other resource areas including watershed, riparian, wetlands, livestock grazing, and roads. The Forest is currently reviewing other forest plans and more recent forest planning direction to develop a better link between the stream physical habitat, the biological habitat, and water quality. Information gathered will be used in the revision of the Forest Plan so that management of fish habitat may be more thoroughly addressed in the revised plan.

Monitoring of fisheries mitigation associated with reconstruction of the North Fork Highway (Buffalo Bill Scenic Byway) continued. Random rock cover placement structures were installed during the early spring of 1999 in three areas of the North Fork Shoshone River: Laughing Pig, Horse Creek and Elk Fork Cliff, and on lower Elk Fork Creek. This was done as Phase II fisheries mitigation for highway encroachments on the North Fork River that impacted fisheries habitat.

The structures were installed according to recommended Forest specifications. It was determined that the structures were not functioning as intended in terms of providing additional pool habitat and resting areas for fish. As a result, a sub sample of the structures, including the one in the Laughing Pig area of the North Fork and Elks Fork Creek, were adjusted in the fall of 2000.

During the summer of fiscal year 2001 the rock cluster adjustments were evaluated. Although the river reached bankfull for only a short time, setting the top rocks of the cluster at or above bankfull created the desired fish habitat (scour holes, deep pools, resting habitat and feeding lanes). Further monitoring will be conducted in fiscal year 2002 after runoff. The Forest plans to adjust the remaining clusters in the Elk Fork Cliff and Horse Creek areas of the North Fork as money and heavy equipment become available.

The Wyoming Game and Fish Department (WGFD) constructed the Horse Creek Fish Enhancement Project in 1993. See the 1995 Monitoring and Evaluation Report for more details on this project. Monitoring of the effectiveness of these structures continues. The structures below the Horse Creek campground have been effective in preventing any further road erosion and in providing fish habitat. Overall, the project has been successful. Fish densities and biomass have increased significantly. In the upstream section some structures constructed by WGFD have deteriorated and are not functioning as intended. WGFD and Forest fisheries biologists met in 2001. The decision was made to monitor the situation further and to reevaluate in 2002 whether any additional restoration or structure maintenance work is needed.

Evaluation

As mentioned above, little direction exists in the Forest Plan for overall fisheries habitat improvements. However, on a site-specific basis, habitat improvements have been effective in accomplishing habitat improvement goals.

3. Riparian Condition

Various interdisciplinary teams and resource specialists monitored riparian condition across the Forest (see Water Resources, Fisheries, Range and Wildlife sections for additional riparian monitoring). This section addresses riparian monitoring conducted by the fisheries crew.

Past tie hacking stream effects are monitored on a periodic basis. In fiscal year 2000, the fisheries crew investigated the effects of past tie hacking activities on Warm Springs Creek upstream of the Warm Springs Canyon (Wind River Ranger District). In fiscal year 2001 the fisheries crew collected detailed flood plain and channel measurements documenting suspected conditions. The exiting channel was straightened, incised, and widened. This information will be used to develop a stream restoration design and plan.

The Forest fisheries crew and other resource specialists conducted riparian monitoring on various livestock allotments in 2001. On the Clarks Fork Ranger District, the Ghost Creek allotment (Unit 4, Muddy Corrals) was monitored for livestock grazing impacts. Portions of the riparian area along Ghost Creek were previously identified as having been negatively impacted by livestock. Details may be found in the fiscal year 1999 Monitoring and Evaluation Report.

In addition the Basin allotment, Russell Creek, and the riparian pasture on the Clarks Fork Ranger District, were monitored. This is a high use livestock area adversely impacting the stream and riparian area. Details may be found in the fiscal year 1999 Monitoring and Evaluation Report.

Stream crossings are also monitored as part of the annual program of work. On Squaw Creek (Clarks Fork Ranger District) a project to remove two problem culverts to allow fish passage, replace a third with a bottomless arch, place the new road on the hill side and rehabilitate old county road 117 was completed. This project was accomplished through a cooperative effort between the Shoshone National Forest, Park County, Wyoming Department of Environmental Quality, National Fish and Wildlife Foundation, and WGFD.

A culvert crossing on Newton Creek in the Newton Creek Campground (Wapiti Ranger District) had periodically backed up, flooded portions of the campground, modified the channel, and created a barrier to upstream fish passage. A bridge was installed in the spring of 2000 that spanned the entire flood prone area. In 2001 over mature trees were removed via a selection tree timber sale. The objective was to provide more sunlight to stimulate deciduous riparian growth along the stream banks, remove hazardous trees in the campground and help deter insects and disease.

A single culvert was realigned, an additional culvert installed, and an overflow channel was created on Burroughs Creek (Wind River Ranger District) to correct fish passage, road erosion, and safety problems on FDR 510. This project more than doubled the volume of flow the stream crossing could handle.

The undersized culvert on FDR 101 crossing Gas Creek had created a partial fish barrier, significant bank erosion, and a safety hazard. In fiscal years 2000 and 2001 the culvert was removed, an armored ford stream crossing created, stream banks contoured, native vegetation planted, and coconut cloth installed to minimize erosion.

Evaluation

Preliminary research on Warm Springs Creek above the canyon in the area of the old Dunoir Camp indicates that major transport of a large number of ties, including splash dam operations, channelization

and dikes resulted in a wider, shallower, and less sinuous reach of stream than expected for this valley type.

Riparian condition in livestock allotments will continue to be monitored. On the Ghost Creek allotment, off-site watering was installed in fiscal year 2001 to help alleviate riparian problems. Effectiveness monitoring will be conducted.

In Russell Creek, stream banks were monitored to determine the effectiveness of the off-site water installed this year. There was a marked improvement with little or no physical impacts to the stream bank from livestock. At this time there are no plans to fence the stream and monitoring will continue for use of the off-site water and livestock impacts to the stream.

Work performed on the Squaw Creek stream crossing was effective. Fish can now access the entire Squaw Creek drainage. The stream is currently beginning to narrow, developing point bars, and establishing streamside vegetation. In 2001, burned snags were pulled into the old roadway to deter ATV use, livestock trailing and provide micro sites for conifer seedlings that were subsequently planted. A significant runoff event has not occurred since the project was completed. Follow-up monitoring will continue to determine how the stream adjusts and if any additional stream restoration work is needed.

During the summer of 2001 a major thunderstorm flood event occurred in Newton Creek that resulted in significant movement of substrate, logs and debris. The bridge and channel in this area handled the event with no detectable adverse channel effects.

On Burroughs Creek, the capacity was significantly increased and fish passage greatly improved. Large wood plugging the culverts may be a concern in a significant flood event and will be monitored.

Fish in Gas Creek now have unimpeded access to the upper stream reaches.

4. Population and Habitat Trend of MIS

Wildlife

Five game species (mule deer, elk, bighorn sheep, moose, and mountain goats) are designated in the Forest Plan as MIS species based on their economic importance and the level of public interest in them. Wyoming Game and Fish Department (WGFD) monitors population trends of all these species using visual counts, harvest data, and population modeling. They set objectives for each separate herd unit based on the carrying capacity of the winter ranges, historic trends, land management agency input, and public input. WGFD manipulates hunting seasons and permits to adjust the trend of the herd toward the objective. Below are the herd units for each species that occur, at least somewhat, on the Forest, and their estimated population trends.

Evaluation

Figure 4. Mule deer herd unit data for 2001

Herd Unit	%Deviation from Objective	Estimated Population Trend
Dubois	- 34	Slightly Increasing
South Wind River	- 18	Slightly Increasing
Clarks Fork	- 8	Increasing
Upper Shoshone	+ 6	Increasing
Meeteetse/Owl Creek	- 25	Slightly Increasing

Most of the mule deer herds across the Forest are under objective but are increasing in population. WGFD has restricted hunting seasons on these herds to allow herds to grow toward the objective numbers. As the herds near the objective, these restrictions are loosened to slow the growth trend.

Figure 5. Elk herd unit data for 2001

Herd Unit	% Deviation from Objective	Estimated Population Trend
South Wind River	+ 12	Slightly Increasing
Wiggins Fork	+ 35	Decreasing
Gooseberry/Greybull	+ 17	Slightly Decreasing
Cody	+ 17	Decreasing
Clarks Fork	+ 40	Decreasing

All elk herd units are currently over objective but most are in a decreasing trend. Present harvest levels have been inadequate to decrease the herds, so WGFD is encouraging additional harvest in attempts to stabilize these herds.

Figure 6. Moose herd unit data for 2001

Herd Unit	% Deviation from Objective	Estimated Population Trend
Dubois	+ 30	Increasing
Lander	+ 33	Increasing
Thorofare	- 57	Decreasing
Shoshone	- 17	Stable
Clarks Fork	- 20	Decreasing
Gooseberry	- 8	Slightly Increasing

Moose herds on this Forest have been hard to count and therefore there is less confidence in the population modeling than for other species. According to the best predictions possible, most moose herds are under objective with the exception of those on the south end of the Forest (Wind River and Washakie Ranger Districts). Some of the low population levels on the north end are due to habitat loss from the 1988 fires. For the Thorofare herd, harvest limits are being restricted in hopes of turning away from the decreasing trend.

Figure 7. Bighorn sheep herd unit data for 2001

Herd Unit	% Deviation from Objective	Estimated Population Trend
Temple Peak	- 85	Stable
Whiskey Mountain	- 40	Slightly Decreasing
Clarks Fork	- 16	Slightly Increasing
Trout Peak	+ 21	Slightly Increasing
Wapiti Ridge	- 2	Increasing
Yount's Peak	- 6	Stable
Franc's Peak	+ 5	Slightly Decreasing

Most herds are under objective but several of these have increasing trends. The Temple Peak and Whiskey Mountain herds on the south end of the Forest are still recovering from massive pneumonia die-offs in the early 1990s. The Foundation for North American Wild Sheep and the Forest Service are currently involved in conducting studies to determine the causes of the population declines, and what can be done to produce a population increase.

There is one mountain goat herd on the Forest, the Beartooth herd. This herd is only slightly under objective (by three percent) and is stable according to the models.

Fisheries

In the current Forest Plan, game trout were selected as the management indicator species for aquatic habitat. Unfortunately, many of the current trout species on the Forest are introduced. Native Yellowstone cutthroat trout (YSC) have been reduced to a fraction of their historic range for several reasons:

introduction of non-native fish species, habitat modification, and degradation. Also, some non-native stream species, primarily brook trout, can tolerate very poor stream habitat conditions yet still maintain viable populations. The issue of fish management indicator species will be addressed during Forest Plan revision.

Various trout populations were monitored in fiscal year 2001. On the Shoshone National Forest, work is ongoing with WGFD to complete detailed mapping of YSC historic, current, potential range and presence of other fish species. The Forest is also involved in an ongoing YSC range-wide effort aimed at determining current distribution, historic range, and assessing population viability risk. This information will be used in forest planning, to work toward a YSC conservation strategy, to identify monitoring needs and for management purposes.

Evaluation

The Greybull and Wood River drainages (Greybull Ranger District) contain one of the last strongholds of YSC on the Forest. Field research was conducted in conjunction with WGFD on the YSC populations in the Wood River drainage. A series of small natural falls in the main Wood River below Double D meadows have created a barrier to upstream fish migration. Substantial suitable fish habitat is available above the falls that is currently fishless. Another large falls just upstream of the Kirwin complex also contains some suitable habitat upstream. In the south fork of the Wood River there is a natural barrier falls located about three miles upstream of the confluence with the main Wood River. Although there is substantial stream mileage, suitable year round fish habitat in these fishless reaches is limited.

Several streams were electrofished in conjunction with WGFD to determine species presence and estimate population size. Dick Creek (Greybull Ranger District) was electrofished in fiscal year 2000 and a mix of YSC and eastern brook trout were found. No fish were found in the north fork of Dick Creek on the Forest.

On Reef Creek (Clarks Fork Ranger District) no fish were found above or below the culvert on Highway 296 in fiscal year 2000. Downstream, there are a series of cascades and a steep stream gradient that fish from the Clarks Fork River cannot negotiate. There is very little suitable fish habitat upstream of the highway culvert.

In fiscal year 2001, the main Wood River was electrofished just above the confluence of the south fork to determine brook trout abundance in this YSC fishery. It was found to be a good YSC fishery with low numbers of brook trout.

The Greybull River was also electrofished in 2001 just upstream of the Jack Creek campground to determine the health of the YSC fishery. High relative densities of YSC were found along with a fishery in good condition. No brook trout were found.

In 2001, Crandall Creek just upstream of the Crandall Creek station was electrofished. The purpose was to determine post-fire fishery conditions and potential needs for special regulations. WGFD is in the process of analyzing the data.

Range

1. Grazing Use

Grazing use is commercial livestock permitted to graze on the Forest. The units used to report and compare this information are Animal Unit Months (AUM). An AUM is the amount of forage consumed by one 800-pound dry cow in one month (based on the consumption of approximately 28 lbs. of dry forage per day). The amount of forage consumed by recreation visitor livestock and permitted outfitter/guide pack and saddle stock is not included in this category.

Table III-1 in the Forest Plan contains a list of management practices and the proposed outputs for those practices (see Chapter III, pages III-13 to III-14 for range projections). For commercial livestock grazing, the Forest Plan predicted an average annual output of 78 thousand AUM for cattle and horse grazing and 25.4 thousand AUM for sheep and goats for 103.4 thousand AUM per year during the period between 1985 and 2000. During that time several allotments have been closed to commercial livestock grazing resulting in the current allocation of 77.4 thousand cattle and horse AUM and 20.3 thousand sheep AUM for 97.7 thousand AUM.

Figure 8 below displays annual authorized commercial livestock use on the Forest from 1986 to the present. No commercial goat grazing is occurring on the Shoshone. Authorized non-use indicates that grazing use was offered but the permittee declined to use it for personal reasons or no grazing took place to provide for resource protection. Non-use for resource protection is usually associated with needed rest before and after a prescribed fire or during a period of severe drought. Although vacant sheep allotments are available for grazing, they were not grazed this year either due to lack of demand, conflicts with other resources or because the grazing permit was waived back to the Forest Service with no preferred applicant and no recent environmental analysis had been completed.

Figure 8. *Authorized commercial livestock grazing use (1,000 AUM)*

Year	Cattle/Horse	% Plan	Sheep	% 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
1999	56.5	73	1.3	7	57.8	60
2000	56.5	73	1.3	7	57.8	60
2001	48.2	62	1.0	4	49.2	50

Figure 9. *Summary of actual stocking and season of use for 2001*

Status	Number of Allotments	% of Total
Fully Stocked	32	38
Partially Stocked and/or Shortened Season	44	52
Non-use due to Drought Conditions	5	6
Rested as part of AMP	1	1
Vacant (sheep)	2	2

Evaluation

Permitted grazing use by commercial livestock has never reached levels projected in the Forest Plan. Cattle grazing has averaged about 57,600 AUM, or approximately 58 percent of projected. Sheep grazing has been at an even lower level, averaging about 1,600 AUM or approximately eight percent of projected. Actual use in the calendar year 2001 grazing season was even lower due to severe drought conditions that resulted in numerous allotments in non-use, fewer than permitted livestock numbers stocked, and a significantly shortened grazing season. While demand for cattle grazing allotments is high, sheep allotments remain vacant due to a lack of demand resulting from a depressed market, predation problems and conflicts with threatened and endangered wildlife species.

2. Vegetation Utilization

Vegetation utilization by both livestock and wildlife is measured by various methods, including ocular estimation (visual estimates), height/weight measurements, and clipping and weighing. Ocular estimation and browse transects were used to monitor use on browse plants. A combination of these methods was used in the 2001 field season to monitor utilization on 51 allotments. This represents 61 percent of 84 allotments upon which commercial livestock were authorized to graze. Most of the allotments on the Shoshone National Forest are managed under a modified deferred-rotation grazing system. Under this system, grazing is delayed (not scheduled) on a given area or unit of the allotment during the active growing season to allow plant reproduction, recovery, and establishment of new plants.

The Forest has an ongoing range utilization, condition and trend-monitoring program performed by the permittees. This data collection process was established in 1998 with assistance from the University of Wyoming and the Wyoming Agricultural Extension Service. There are currently 28 permittees collecting some type of monitoring data on 33 of the allotments listed in table 7.

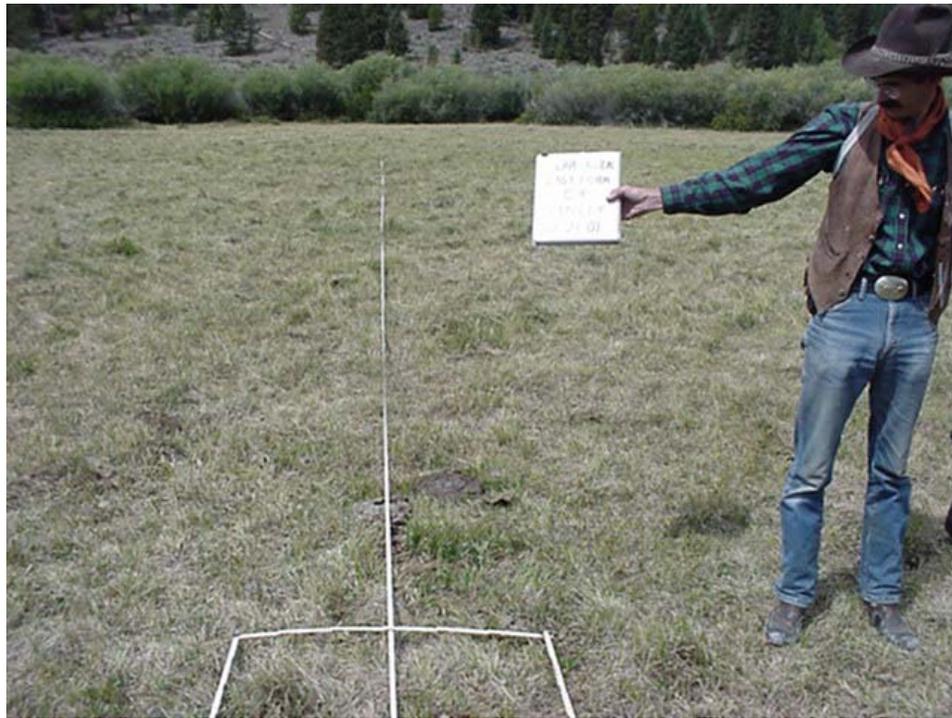
Figure 10. *Number and acres of allotments monitored in 2001*

Monitoring Responsibility	Allotments
Forest Service	18
Forest Service/Permittee	18
Permittee	15
Total Acres	173,650

Evaluation

Despite the drought conditions over much of the Forest, forage utilization by commercial livestock generally did not exceed acceptable standards on any one allotment during the calendar year 2001 grazing season. Livestock were removed from the Forest earlier than the permitted off date on many allotments because the allowable utilization levels were reached. In a few instances, utilization on isolated areas within an allotment 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 percent for the allotment. The removal of livestock when allowable utilization was reached, despite significantly shortened grazing seasons due to drought, is an indication of the success of the range monitoring program on the Forest.

Figure 11. Permittee monitoring (line utilization transect) on the Wind River District



3. Range Condition and Trend

Range analysis field exams are conducted according to a process described in the Region 2 (Forest Service Rocky Mountain Region) *Rangeland Analysis and Management Training Guide* and the *Interagency Technical Guide*. The methods used during the 2001 field season were photo point, photo transects, and general observations made during allotment inspections.

Evaluation

Initial analysis of the data, reports, and photographs indicate that, in nearly every case, range conditions are improving and moving toward the desired conditions. Range already in desired condition showed the least change and those changes were due to natural succession. Rangeland that is in less than desired condition demonstrated the greatest response to improved management and more intensive livestock manipulation. Forest-wide, with a few exceptions, range vegetative conditions are either at or moving toward the desired conditions as outlined in the Forest Plan and/or Allotment Management Plan.

Figure 12. Browse transect (cover and photo) on the Washakie Ranger District



4. Allotment Management and Permittee Plans

The Environmental Assessment (EA) for 31 livestock grazing allotments was released for public review and comment in December 2000. The interdisciplinary team responded to those comments and the document was edited to address them. Following completion of the Heritage Survey and Biological Evaluation, this field season, the final EA will be published along with the appropriate decision document. Allotments included in the analysis are:

Bald Ridge, Crandall I, Crandall II, Ghost Creek, Deep Lake, Big Creek, Dunn Creek, Trout Creek, Green Creek, Logan Mountain, Pearson, Rattlesnake, Jim Mountain, Wind River, Bayer Mountain, Ed Young Basin, Frye Lake, and Middle Fork.

Once the decision document is signed an Allotment Management Plan (AMP) will be developed that implements management practices to achieve the desired conditions outlined in the selected alternative.

Grazing instructions are developed and reviewed by Forest personnel and the permittee in conjunction with the Allotment Management Plan if one is in place. Annual instructions specify the rotation schedule, number of livestock, the season of use and any other practices that are necessary for proper management of the resource and to implement the Forest Plan standards and guides.

Figure 13. *Forest range management specialist and permittee working together to develop an annual monitoring plan*



Evaluation

Only the 18 allotments listed above will be included in the final EA and decision document. This is due to the limited time and money available for the required Heritage surveys. It will be necessary to complete the survey and analysis for the remaining allotments in 2003 to keep up with the schedule outlined in the Rescission Act (Public Law 104-19).

5. Forage Development (Range Readiness)

Sufficient plant development, before grazing, helps ensure the long-term health and vigor of the rangeland resource. Range readiness is checked to verify adequate forage development prior to livestock use.

Evaluation

No range readiness data were collected this year due to severe drought conditions. In times of drought snowmelt occurs earlier than normal resulting in early and rapid plant development. As such range readiness was not a concern this year.

6. Noxious Weeds

There are four aspects to the noxious weed control program. They are prevention/education, detection/inventory, control (biological, chemical, and mechanical), and restoration. In fiscal year 2001 the Shoshone National Forest was involved in all four areas.

Education efforts continued through the Bureau of Land Management's (BLM) student conservation program. Talks were given to schools, backcountry users, and county fair audiences, and newspaper articles were published.

The South Fork Weed Management Area hosted an invasive species congressional tour with the BASF Company and continued to work on educating South Fork residents on dalmatian toadflax.

The Dubois-Crowheart Weed management Area was initiated in fiscal year 2001 with the primary goal of fostering community weed awareness.

The Forest continued to inventory noxious weeds and undesirable plants in 2001. Data collection focused on the Wind River and Greybull Ranger Districts. Data was entered into a Forest GIS database and will be shared with other forests and county weed and pest organizations in the Greater Yellowstone Area. Over 1,500 separate locations have been identified in the last two years. New weeds identified this year include yellow toadflax and common tansy.

Forest personnel, contractors, and county weed and pest districts treated approximately 1500 acres of National Forest System land infested with noxious weeds. Treatments included the use of chemical, mechanical, and biological control agents. Areas of spotted knapweed and hound's tongue on the Clarks Fork and Wapiti Ranger Districts were monitored and treated throughout the fiscal year 2001 growing season. Repeated treatments were made to eliminate new seedlings and prevent seed dispersal.

Last year's fall treatment of toadflax along the South Fork of the Shoshone River was monitored in the early summer for effectiveness. It was determined that herbicide Plateau was very effective in treating toadflax. Some problems were noted due to application difficulty in rough terrain. Helicopter treatment alternatives should be considered but would require environmental analysis and most likely an environmental impact statement. BASF research scientists continue to monitor herbicide effectiveness in toadflax control plots on adjacent private lands.

Josh Shorb of Park County Weed and Pest and Dr. Richard Hansen of APHIS monitored biocontrol efforts on dalmatian toadflax. It was determined that *Mecinus janthinus*, a stem-boring weevil, successfully over-wintered and was inflicting heavy damage to toadflax at the release sites.

Washakie Wilderness toadflax herbicide treatments areas were revisited in fiscal year 2001. Dramatic reductions in toadflax were observed. Wilderness trailheads were also monitored for invasive plants. Problem areas were observed at Pahaska, Fishhawk, Double Cabin, and Dead Indian trail heads.

Once an area is treated, restoration of the area to pre-infestation conditions, or better, needs to be considered. Native vegetation recovery is being monitored on the Cabin Creek Fire sites that received herbicide treatments. Some temporary stunting of native grass seed heads were observed. A very positive byproduct of the use of Plateau was the reduction of cheat grass, which is also an invasive species.

Evaluation

The prevention/education program continues to grow with positive results. If possible, education efforts of the Student Conservation Association program in conjunction with the Cody BLM office should continue in fiscal year 2002. Work in conjunction with the Dubois-Crowheart Weed Management Area is essential for weed control on public lands in the Upper Wind River valley.

The detection and inventory programs need to be continued on an annual or biannual basis. Information developed by the program is essential for the Shoshone National Forest to establish baseline data to monitor new populations, increases or decreases in existing infestations, and as a way to measure the success of weed control treatments. Financing this work may become a problem if grant applications are not successful in fiscal year 2002.

Control activities need to expand in fiscal year 2002. Emphasis species include dalmatian toadflax, spotted and diffuse knapweed, and houndstongue. Repeated treatment of these species needs to occur during the growing season to eliminate new seedlings and prevent seed dispersal. The treatment of dalmatian toadflax in the South Fork drainage will remain a priority in fiscal year 2002. Additional releases and monitoring of the biocontrol insect *Mecinus janthinus* are planned in fiscal year 2002. Scoping for proposed helicopter spraying is planned in the fall of 2002.

Restoration of weed infested areas needs to be given more emphasis in fiscal year 2002. The establishment of competitive grasses in road rights-of-way treatment areas needs improvement. Monitoring of native plant-herbicide relationships should also continue in fiscal year 2002.

The Forest invasive species problem continues to grow as knowledge about distribution increases. However, the level of infestation is still relatively low (with the exception of the South Fork of the Shoshone River drainage) when compared to other parts of the Greater Yellowstone Area. Future aggressive treatment programs and constant monitoring are essential in containing and eliminating invasive species. Unfortunately, this program area will be in a growth cycle for years to come.

Grants received for the weed program in fiscal year 2001 provided the Forest with the ability to accomplish needed work. Without grants, the Forest invasive species program would be unable to keep up with attention and treatment of noxious weeds. Accordingly, budgets will need to increase or a vigorous grant-writing program continued in fiscal year 2002 for the Forest to keep up with the invasive species problem.

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 planning period specified in the Forest Plan. The quantity is normally expressed as the average annual allowable sale quantity. The intent of this monitoring item is to facilitate tracking of how close the Forest is to meeting the ASQ during any given year, and to ensure that it is not exceeded in any given decade.

The revised ASQ is 45 million board feet (MMBF) per decade or an average annual of 4.5 MMBF.

The Shoshone National Forest sold 0.112 MMBF of green (live) timber. This figure represents approximately 3.7 percent of the target for green sawtimber for the fiscal year. The Forest also sold 2.9 MMBF of salvage volume, consisting of small salvage sales, fuel wood, and other product sales (post and pole, commercial fuel wood, house logs, etc.). The total sale volume that the Forest proposed to sell in 2001 was approximately 6.0 MMBF. Total volume the Forest sold in fiscal year 2001 was approximately 3.0 MMBF. This amount represents approximately 50 percent of the total volume the Forest planned to sell this fiscal year.

In fiscal year 2001 the Forest conducted a formal interdisciplinary review of the Lodgepole II Timber Sale, which focused on compliance with the requirements of the Clean Water Act, Wyoming Non-point Source Management Plan Silviculture Best Management Practices and the Watershed Conservation Practices Handbook. (See the Water Resources section of this monitoring report for the results of this formal review.)

Evaluation

The Forest lost forestry staff to other jobs in fiscal year 2001. Four of the six forester positions on the Forest were vacant this fiscal year, which amounts to a loss of four person-years of work in the area of timber management. Subsequently no environmental analyses and subsequent documentation was completed on upcoming timber sales. The new national requirement to complete a roads analysis (RAP) for any activity involving road construction or reconstruction or a change in road maintenance has added to the process.

Another factor affecting timber sales on the Forest for the last couple of years relates to evolving national policies and interpretation of those policies dealing with roads. The development of a new transportation

policy, elimination of purchaser road credit from all new sale offerings, and the evolving roadless area policies have all affected the Forest's ability to plan and subsequently offer sales.

The Dick Creek timber sale was modified to comply with the roadless policy. Modifications included dropping cutting units and changing methods of harvest to include winter logging and the possible use of forwarders. These changes eliminated the need for new road construction. Only reconstruction of existing roads will occur. These changes delayed offering the timber sale in fiscal year 2001.

The Double Cabin timber sale was involved in a lawsuit that included a timber sale on the Bighorn National Forest. Complaints included the evaluation of Management Indicator Species and compliance with the roadless policy. This sale was put on hold in fiscal year 2001 and will be re-evaluated in fiscal year 2002.

The low level of vegetation treatment that was accomplished this year and in past years is of concern to management and to some members of the public. Many of the stands of timber on the Forest are in declining health and are approaching late successional stages. These stands of timber are most susceptible to insect and disease attacks and to the risk of wildfire. Insect and disease activity is increasing on a Forest wide basis and is anticipated to continue at an elevated rate until these infected stands are brought under management, and age class and species diversity is reestablished on the Forest.

Tree mortality is increasing substantially and can be viewed from any travel way on the Forest. Loss of minor tree species, such as aspen and narrow leaf cottonwood is occurring due to the invasion of conifer species through succession and lack of management. These issues need to be addressed in project level analysis and in the revision of the Forest Plan.

Three of the four vacant timber forester positions have been filled; the fourth position will be filled this spring. Environmental analyses, documentation, vegetation treatment, and monitoring activities should increase as the timber program becomes fully staffed.

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 5th year by requiring regeneration surveys one, three and five years after the clearcut.

In 1992, three timber sales were treated by clearcut on the Wind River Ranger District of the Shoshone National Forest. The sales are the Union Pass Blowdown, Trapper Creek, and Wildcat Blowdown.

The Union Pass Blowdown was surveyed this year and met restocking criteria. Trapper Creek was planted in the spring of fiscal year 2000, as scheduled, and met the first year surveys to be certified as fully stocked. Additional survival surveys will be completed on this area in the third and fifth years after planting. It is anticipated that certification of the sale area will be achieved after the fifth year survey.

The Wildcat Blowdown was scheduled for spot planting or fill-in planting in fiscal year 2001. This did not occur because a regeneration survey was completed which indicated the site met Forest Plan stocking requirements. The area will be resurveyed in fiscal year 2002 and if stocking levels are at required levels it will be certified in fiscal year 2002.

On the Washakie Ranger District in fiscal year 2001, there were approximately 16 acres of patch clearcuts ranging in size from less than one acre to eight acres. These treatments were made along the Loop Road, a major road on the district, to enhance site distance on the road, improve visual openings, enhance aspen regeneration, and provide fuel breaks. Regeneration surveys are scheduled for 2002 on these treated areas.

Monitoring and review of various records and databases this year by Forest and district timber staff indicated that previous clearcuts along the Loop Road had not been captured in the Forest's vegetation database. The purpose of the clearcuts was fuels reduction and to enhance site distance along the road. The treatments consisted of one acre in 1996, seven acres in 1997, and 23 acres in 1998. This oversight has been corrected and the openings will be added to the database and tracked from now on. Regeneration Surveys will be conducted on them in fiscal year 2003. It is expected that these areas will meet the stocking requirements set forth in the Forest Plan.

Evaluation

Monitoring through on-the-ground surveys indicates that the majority of the clearcuts that were made before 1976 fully meet the criteria to be certified as fully stocked.

The majority of clearcuts on the Shoshone National Forest occurred before the passage of the National Forest Management Act in 1976. Although regeneration surveys are not required for those acres clearcut before 1976, the Forest has spent considerable time visiting, evaluating, and surveying those acres in order to update records and evaluate past silvicultural treatments.

The Forest completed approximately 2,100 acres of regeneration surveys in fiscal year 2001.

3. Other Reforestation Monitoring

Personnel of the Forest's North Zone (Clarks Fork, Greybull, and Wapiti Ranger Districts) completed approximately 685 acres of extensive reforestation surveys in fiscal year 2001 to prepare for outyear planting of whitebark pine on non-suited acres. These surveys took place on the Clarks Fork Ranger District predominantly in the 1988 Clover Mist wildfire area. Force account crews conducted additional survival and growth exams on 948 acres in fiscal year 2001.

Evaluation

Survival percentages this year were below average. This is likely due to intermittent moisture on the planting sites where first year survival surveys were conducted. It is anticipated that subsequent third and fifth year survival surveys will indicate higher survival rates. This is based on predicted spring precipitation on the planting sites. In general third and fifth year surveys are better survival indicators.

Some damage occurred in planted areas due to wildlife and domestic livestock eating or trampling seedlings, especially in the Squaw Creek and Pilot Creek planting units. Should these sites not meet minimum stocking requirements, they will be replanted and adequately protected from domestic livestock.

4. Timber Stand Improvements

Timber stand improvement (TSI) is any vegetation management activity that improves the composition, condition, or growth of a stand of trees. This monitoring item requires that acres of TSI not vary more than 25 percent from what is planned annually. The Forest Plan projected 121 acres per year of TSI for the period between 1991 and 2001 (Shoshone National Forest Land and Resource Management Plan, Table III-1, page III-14). The following is a list of the acres of TSI projected by the Forest Plan and accomplished for the last eleven years.

Figure 14. *Projected acres of TSI and actual acres treated 1991-2001*

Year	Forest Plan Acres	Acres Treated	% of Forest Plan
1991	121	40	33
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
1999	121	882	728
2000	121	0	0
2001	121	0	0
Average	121	293	242

During the past 11 years, emphasis for TSI activities has been placed in cutover areas to enhance new stand growth by reducing competition on desirable species and to promote individual tree growth. The majority of this work has been achieved using TSI contracts that are inspected by Forest personnel. Force account crews and seasonal work crews have also completed TSI treatment under the guidance of a forester within this period. Contract inspectors and foresters, using daily diaries and inspection reports, monitored accomplishments for the period shown above.

No new areas were contracted in fiscal year 2001 due to the listing of the lynx as a threatened species. The Forest identified Lynx Analysis Units (LAU) and potential lynx habitat this past year. Evaluation of potential LAUs will continue in 2002 and may result in additional LAU acreages. Before thinning can occur in these areas each site must be evaluated to ensure there is minimal impact to lynx habitat. Areas with potential for TSI will be evaluated against potential lynx habitat identified in fiscal years 2001 and 2002 to determine if any additional thinning can occur there. Approximately 4,000 acres with TSI needs are in lynx habitat. Thinning may only be temporarily halted and may change with the amendment to the Forest Plan currently in progress.

Evaluation

Between 1991 and 2001 the Forest accomplished approximately 242 percent of what the Forest Plan projected for acres of TSI. Some of the TSI contracts span multiple years, therefore acreage accomplishments will vary from year to year, with accomplishments exceeding planned acreage targets in some years.

One major reason the Forest Plan TSI estimates were exceeded on the Shoshone National Forest relates to the fact that clearcuts from the 1960s have grown in and are now overstocked. For example, on the southern part of the Forest, there are at least 4,000 acres of old cutover areas on suited base timberlands from the 1960s. Some of these stands are in need of thinning to lessen competition, promote growth, add to age class diversity, and protect these stands from insect and disease infestations.

TSI work on the Forest is anticipated to decline, at least temporarily, due to federal listing of the lynx. Beginning in the fall and winter of 2000 and 2001, areas outside of lynx habitat are being evaluated and requests submitted for TSI dollars and a TSI target in out years. There is a concern that timber stand improvement work on the Forest may decline in lynx habitat. If timber stands in need of TSI are not treated, growth of these stands may decline, and will be more susceptible to infestations of dwarf mistletoe and commandra blister rust.

5. Growth Response

Growth response to vegetation management is monitored through stand exam surveys. Data collected by stand surveys is used in growth and yield models to predict annual and long-term growth patterns and

potential. Monitoring of growth response tells the manager whether vegetation responds to treatments and silvicultural prescriptions as predicted. No stand exam surveys were conducted in fiscal year 2001 on the Forest.

Evaluation

Data gathered in past years indicates that growth response in planted stands surveyed on the North Zone of the Forest are meeting the expected growth potential. Stands clearcut in the 1960s on the South Zone of the Forest that were surveyed for growth response after treatment are at least meeting, if not exceeding the expected growth potential. However there is evidence that residual stands adjacent to those treated in the 1960s are heavily infected with dwarf mistletoe and commandra rust. Treatment of the adjacent stands and thinning of the new stands is critical to maintaining maximum growth potential and to reduce infection by mistletoe and commandra rust. Stands left untreated and densely stocked are more susceptible to infections from dwarf mistletoe, commandra rust, other diseases, and insect attacks. Potential for stand replacing fires is also a concern due to the age of the forest and the buildup of dead and down fuels.

6. 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.

7. Lands Not Suited for Timber Production

Lands not included in the suited timber base may not be managed for wood fiber as the primary product but may be managed for other resource objectives. In some situations wood fiber is a byproduct of resource management activity, such as when openings are created for wildlife in a forested area. The Shoshone National Forest Land and Resource Management Plan contains standards and guidelines that 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 be managed for the appropriate resource objectives.

In fiscal year 2001, a tree-harvesting project was completed on the Wapiti Ranger District along the North Fork corridor (Buffalo Bill Scenic Byway) on non-suited timbered lands. The project was designed to remove timber from the old Eagle Creek campground. Having the tree removal occur before the campground project began reduced the reconstruction cost of the Eagle Creek campground. Hazard trees were also removed from the site. Remaining woody material was made available to the public for fuel wood collection. Work was accomplished in support of the recreation program on the Forest through a timber sale contract. This project saved the Forest an estimated \$20,000 in campground reconstruction costs.

Some of the reforestation work performed in fiscal year 2001 is on non-suited lands where the 1988 Clover Mist Wildfire destroyed conifer stands. The objective of planting these areas is primarily restoration of hydrologic function, restoration of wildlife habitat, and improvement of vegetative diversity in these areas. Additional planting of whitebark pine was completed in fiscal year 2001 on non-suited lands. Planting is accomplishing two objectives: 1) providing a food source for the grizzly bear, and 2) reestablishing whitebark pine that is blister rust resistant in areas where this species was destroyed by the wildfires of 1988, and in areas where white pine blister rust has caused heavy mortality on this tree species.

Evaluation

The vegetation management projects mentioned above involve removal of timber from non-suited lands for reasons other than commercial timber production. Individuals, communities, and businesses

neighboring the Forest utilize material such as fuel wood (commercial and personal use), post and poles, house logs, and sawtimber.

Removal of products such as fuel wood from the forest is authorized by obtaining permits or through contracts.

8. Forest Health

On the South Zone of the Forest widespread infection of lodgepole pine by both commandra rust and dwarf mistletoe continues to severely affect the growth of stands. Stand exam surveys and routine field observations indicate that the reproductive potential of lodgepole pine may be at risk in many stands due to the proliferation of these diseases. Commandra rust kills the seed/cone producing portion of the tree, while dwarf mistletoe reduces vigor and the tree's ability to produce cones and eventually results in premature death. The fact that the majority of lodgepole pine have non-serotinous cones, or cones that open annually to release seed, compounds the problem since the tree is not able to store seed in the previous year's cones.

Forested stands on the North Zone of the Forest also have commandra rust and dwarf mistletoe infestations although not to the extent found on the South Zone. In addition the North Zone continues to experience epidemic levels of Douglas-fir bark beetles on all three districts. Several key areas include the North Fork of the Shoshone River corridor between the Forest boundary and the east gate to Yellowstone National Park, the South Fork of the Shoshone River, and the Chief Joseph Scenic Highway between Cooke City, Montana and Cody, Wyoming. Large overstory trees in excess of 12 inches in diameter are most at risk. This is affecting high use campgrounds like Newton Creek and Eagle Creek, as well as the majority of the recreation corridors. Spruce beetle damage is severe on the backs of many side drainages of the North Fork and South Fork of the Shoshone River.

Both whitebark and limber pine are being impacted by a complex of mountain pine beetle, white pine blister rust, and/or dwarf mistletoe on all districts of the Forest. Subalpine fir is declining on the Forest also. This decline is poorly understood, but it is thought that a combination of western balsam bark beetle and diseases such as armillaria root rot play a role in tree death (Reference: Forest Health Management Survey reports for the Shoshone).

Evaluation

Most stands comprised predominantly of lodgepole pine, Douglas-fir, Englemann spruce, limber and whitebark pine are showing negative net growth rates or mortality exceeding growth. As a result, accumulation of fuel from dead and dying trees has put these stands at a higher risk of wildfire. A catastrophic disturbance, such as a large wildfire, may result in a dramatic reduction or loss of these species in the affected areas.

Conditions on the Forest in terms of forest health have changed since the original Forest Plan was written. Forested stands are older and the effects of prolonged infection are more evident in the form of increased net mortality. The loss of forested stands has the potential to affect all resources, from recreation to wildlife. This situation needs to be addressed during Forest Plan revision. A range of vegetative treatments including timber harvest and prescribed fire should be implemented.

Douglas-fir stands in the Newton Creek and Eagle Creek campgrounds will be protected this summer through the use of disaggregation hormones that repel Douglas-fir bark beetles, as they were last year. This protection will continue until beetle levels in these areas return to endemic levels. It is recognized that this is a stopgap measure.

It should also be noted that significant mortality is occurring along the highway corridors that access the Forest. One form or another of insects and diseases is affecting lodgepole pine, Douglas-fir, Englemann spruce, subalpine fir, whitebark and limber pine. As stated earlier, this is due to the age of the forest and the increased levels of insect and disease activity.

In a recent report on the *Evaluation of Douglas-fir Beetle Along the North Fork of the Shoshone River, Shoshone National Forest, Wyoming* (Allen, K.K.; and D.F. Long. 2002. USDA Forest Service, Rocky Mountain Region, Renewable Resources. Bio. Eval. R2-02-03. 9 pp.), the authors state, "In 1988, extensive wildfires occurred in Yellowstone National Park and the Shoshone National Forest. Populations of Douglas-fir beetle increased in fire-scorched trees caused by the wildfires. Subsequent generations of the beetles moved from these injured trees to undamaged trees in neighboring stands on the Shoshone National Forest Wyoming. This outbreak has now moved and is concentrated along the North Fork of the Shoshone River. ... Continued use of sanitation harvest and anti-aggregation pheromones, where possible, is recommended." (www.fs.fed.us/r2/fhm/reports/be_r2-02-03.pdf)

Water Resources

1. Effects of Specific Resource Management Practices on Waters of the U.S.

Programmatic monitoring related primarily to effects of the transportation system, expanding recreation use, and water diversions.

Specific qualitative and quantitative project monitoring occurred on timber sales, livestock grazing allotments, prescribed fire projects, wildfire burns, highway reconstruction projects, special use permit areas or sites and recreation areas or sites.

In addition to programmatic and project monitoring, database development efforts initiated in previous years continued.

Evaluation

Concerns over erosion and sedimentation from the transportation system continue. These concerns relate not only to the existing system, but expansion of it, primarily from increased motorized recreation use. The Forest is continuing condition inventories and building a reliable transportation layer in the GIS database (*see* Facilities and Recreation). The Forest also continues to address transportation system watershed concerns through implementation of the Watershed Improvement Needs Inventory (*see* Soils).

Noxious weed invasion, particularly along travel corridors (trails and roads) continues to be a watershed health concern due to the potential deleterious effects such invasion can have on soil productivity and hydrologic processes. These concerns are being addressed through the Forest noxious weed program (*see* Range and Soils).

In addition to concerns relating to expansion of the transportation system by recreating publics, other concerns exist due to increasing recreation use. These concerns are related to soil productivity and water quality impacts resulting from use at both developed and dispersed sites. As noted in last year's report, these concerns should be addressed during Forest Plan revision. In the interim, site-specific issues should continue to be addressed as they arise and the programmatic monitoring should continue in fiscal year 2002.

Review of special use permit pastures continued during the year, resulting in further identification of concerns with livestock utilization and subsequent negative effects on watershed condition. Forest personnel are working with the permittees that use these pastures on implementing sound grazing practices as part of their special use operations.

Review of several existing water diversions was conducted during the year. In general, there are concerns with head gate maintenance and lack of overall ditch maintenance that presently is or could result in negative effects on watershed resources. Monitoring of ditches should continue in fiscal year 2002.

A formal interdisciplinary review of the Lodgepole II Timber Sale focused on compliance with requirements of the Clean Water Act, Wyoming Non-Point Source Management Plan Silviculture Best Management Practices, and FSH 2509.25, Watershed Conservation Practices Handbook. This sale was primarily an over-the-snow operation whereby no new road construction occurred. However, an existing road that ends at the north edge of the sale area boundary was used to access the sale area and landing. This road is also used by the NRCS to access their SNOTEL site, by biologists from numerous agencies relative to grizzly bear management, and by Forest personnel for administrative purposes. The review demonstrated timber harvest activities, both within the sale area and during use of the access road were in compliance and that best management practices were properly implemented and very effective. The review also showed that use of the road by others is resulting in road maintenance and watershed issues because it is used in the spring and fall during wet conditions. The result is breaching of drainage structures and subsequent erosion and sedimentation. Through discussion, it was determined this issue occurs in other areas of the forest as well. Forest personnel are pursuing a solution to this issue, which could include seasonal closures on all uses or user-based fees to help support road maintenance.

Informal reviews of other timber sale activity occurred as well. Overall, best management practices are being implemented and are effective in protecting watershed resources.

The Dinwoody wildfire was closely monitored to determine if burned area emergency watershed conditions developed. Such conditions did not develop so remediation measures were not prescribed. Several prescribed fires were monitored as well. No substantial watershed issues arose from these projects. The Forest continued its agreement with USGS, as part of the National Fire Plan, to monitor effects of the 2000 Crow Creek Fire on stream flow, sediment transport, and water quality.

Construction of the Laughing Pig section of the North Fork Shoshone River highway (US 14/16/20) concluded during the fiscal year. Monitoring indicates compliance with watershed protection criteria was generally met. Minor concerns that developed as this project was brought to closure were resolved in a timely manner.

Forest staff continued with accelerated implementation of the Natural Resource Information System (NRIS). This system will house soil resource inventory data, water rights information, water quality and stream health data, and watershed improvement inventory needs information. The system is expected to be completely on-line by the end of fiscal year 2002.

2. Water Rights

New water right applications are reviewed to ensure 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 acquired new water rights as shown in the figure below.

Figure 15. *Water rights acquired in 2001*

Name	Permit Number
Timber Creek R.S. Well	U.W. 132608
Rex Hale Campground #1	U.W. 127156
Fishhawk Trailhead Well #1	U.W. 127155
Newton Springs Picnic Area Well #1	U.W. 127154
3 Mile CG Well #1	U.W. 113529
Eagle Creek C.G. Well	U.W. 138425
Eagle Creek Campground Water Haul	32522 (temporary)

The Forest continues to work with the Wyoming State Engineer's Office on resolution of issues related to the Bighorn adjudication. These issues should be completely resolved by fiscal year 2004.

Minerals

Compliance with Terms of Operating Plans and Consistency with the Forest Plan

1. Leasable Minerals

One Application for Permit to Drill (APD) was received in 1999, the Scott Well #2 exploratory well. Environmental analysis for this proposal is scheduled to be completed in 2002.

Evaluation

There were approximately 15,802 acres under lease on the Shoshone National Forest at the end of fiscal year 2001. This represents an estimated one percent of the acres made available for lease (954,300) by the Oil and Gas EIS, Record of Decision.

Monitoring of reclamation efforts on the Lava Mountain well pad continued in fiscal year 2001. In fiscal year 1999 the area was seeded with native grasses and planted with five-foot lodgepole pine transplants at a 40ft by 40 ft spacing with moderate success. The leaseholder, in coordination with the Forest, performed additional work in the area in fiscal year 2000. Work included planting additional trees on the site as required by the revised reclamation plan, and additional work on closure of an old road in the area. This work will complete the requirements on site, as long as the regeneration of trees is successful. First year regeneration survival was at or near 90%. Due to the drought conditions on the site in fiscal year 2001 additional inspection of this site is scheduled in the spring/summer of fiscal year 2002. It is anticipated that the site will meet all the reclamation requirements.

2. Common Variety Minerals

A request for a commercial permit for decorative rock was received on the Wind River Ranger District. This permit will be issued in fiscal year 2002.

Evaluation

Commercial interest in rock material, especially decorative rock, has increased on the Wind River and Washakie Ranger Districts. 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.

Lands

1. Land Exchange Offers

Land exchange is an important tool that can be utilized to consolidate land holdings and provide more efficient management of National Forest System lands. It is a process that is voluntary, which is entered into by mutual agreement between the Forest Service and private landowners. On the Shoshone National Forest, the landownership pattern is already highly consolidated, primarily due to the early establishment of the Forest. This landownership pattern results in a decreased opportunity to complete land exchange relative to other national forests.

A specific target for land exchange was not detailed in the Forest Plan. Opportunities for land exchange which are received as proposals are carefully evaluated, and those proposals that do not have a clear public benefit, or involve landowner selected parcels that are not suitable for disposal are rejected. The

Forest did receive several verbal proposals for land exchange in 2001 and one written proposal. These proposals were evaluated; it was determined that the proposals, as submitted, would not be in the public interest and they were not pursued.

Evaluation

Because there are very few parcels of land on the Shoshone National Forest that are suitable for disposal, the Forest must be highly selective in what exchange proposals are pursued. Saying no to proposals with limited public benefit will ensure that the greatest gain is realized by retaining parcels suitable for disposal until important acquisition parcels can be made part of the proposal.

2. Right-of-Way Acquisition

The Forest Plan identified a need to acquire approximately 278 miles of rights-of-way to secure access via road and trails on the Shoshone. The Forest Plan also predicted that demand by the general public for access to Forest lands would increase due to increased levels of recreational use of Forest lands and demands for timber harvest and other commodity uses.

In support of this demand, the proposed right-of-way acquisition in the Forest Plan was three cases per year in the years from 1985 through 1990, and two cases per year in the years from 1991 through 2000. Projected right-of-way acquisition beyond 2000 was two cases per year.

Evaluation

Challenges to right-of-way acquisition on the Shoshone are typical of the challenges faced nationwide in this program. Landowners adjacent to forest lands place a high value on privacy, and are less inclined to allow public access across their private lands. These landowners typically are not interested in fair market value compensation, as money is frequently not a motivating factor. Landowner concerns of vandalism, trespass, fire, and other potential impacts to private lands make voluntary acquisition of rights-of-way extremely challenging.

Acquisition of rights-of-way by outright purchase is frequently not achievable due to this landowner reluctance to convey access rights to the public. The Shoshone's emphasis on acquiring rights-of-way has therefore focused on acquisition through the landownership adjustment program and acquisition of rights-of-way through reciprocal rights-of-way agreements.

Although the Forest did not acquire any rights-of-way in 2001, a land acquisition case was begun in 2001 and will be finalized in 2002 that will result in the acquisition of two trail rights-of-way. These trails are located in the Wood River drainage and provide access to the Washakie Wilderness area.

3. Landline Location

The Forest Plan identified an estimated 1,250 miles of needed property boundary location on the Shoshone National Forest. It predicted that the need to locate and post boundary would increase with increased timber management activities, increased recreational use, and increasing development of private lands. Because the amount of boundary location and posting are dependent upon available funding, the Forest Plan did not propose or predict an average output for this activity.

Evaluation

The need to mark and post Forest boundaries has increased, as development has occurred adjacent to Forest lands. The Shoshone National Forest's boundary management program has focused on completion of landline location in the highest priority areas where encroachment is most likely to occur.

When budget allocation principles were developed nationwide several years ago, Region 2 (Rocky Mountain Region of the Forest Service) was able to secure a larger portion of the national budget for completion of landline location work. In 2001, the landline target for the Shoshone National Forest was 10 miles. This target was exceeded, with approximately 15 miles of landline location actually being

accomplished. Landline location accomplishment resulted in the discovery of an encroachment of a house and outbuilding on Forest lands.

4. Occupancy Trespass

Encroachments on the Shoshone National Forest are discovered primarily through the completion of landline work as part of the Boundary Management program. Documentation of trespass situations discovered is completed and when the responsible party is known, written notice of trespass is sent.

In 2001, landline work on the Wind River Ranger District resulted in discovery of a dwelling and outbuilding that are in trespass. The landowner has been contacted, and resolution of the trespass is planned for 2002.

Evaluation

Resolution of encroachment situations can be time consuming. In situations like the one described above, a determination must first be made about whether or not the encroachment qualifies for sale under the Small Tracts Sale Act. This authority provides for sales of up to 10 acres of National Forest System Lands in three categories. One of these categories is the encroachment category. To qualify for a sale under this authority the landowner must be able to demonstrate that the original encroacher relies on claim or color of title in his or her occupancy of National Forest System Lands. If the landowner in this situation cannot demonstrate this claim, the only option other option for resolution would be a land exchange. If a land exchange is pursued as the vehicle for resolving the trespass, the exchange must be configured to best serve the public interest in addition to resolution of the trespass.

5. Special Use Authorizations

Special uses are defined as all uses of National Forest System lands, improvements and resources, except those provided for under the timber, grazing, or minerals programs.

The Forest Plan, when written, predicted that demand for special uses on the Shoshone National Forest would increase, and cited an annual rate of increase of approximately five percent per year. At that time, there were approximately 350 special uses authorizations in place on the Forest.

Figure 16 summarizes land use authorizations in place on the Shoshone National Forest in fiscal year 2001.

Figure 16. 2001 Land use authorizations

Type of Special Use	North Zone	South Zone	Forest Total
Organization Camp	1	2	3
Resort	14	5	19
Skiing	4	0	4
Recreation Residence	71	29	100
Outfitter Guide–Priority	49	40	89
Institutional Outfitting	3	35	38
Minerals	2	14	16
Road Easements/Permits	22	13	35
Research	10	9	19
Utilities/Communication	21	25	46
Water Use	68	25	93
Miscellaneous	33	15	48
Forest Total	298	212	510

Evaluation

The summary of existing special use authorizations shows that while the number of special use authorizations on the Forest has increased since the Forest Plan was implemented, the actual increase in authorizations has been less than what was projected by the Forest Plan. Although demand for new special uses remains very high, the number of new authorizations actually approved has been relatively low over the past several years. This is primarily due to an emphasis on ensuring that new uses are consistent with and compatible with the purposes for which the lands are managed.

A new tool to make this easier to achieve became available several years ago. Revisions to the regulations governing special use application processing were finalized on November 30, 1998. These regulations establish a two-step screening process, which all proposed special uses must pass through prior to being accepted as an application approved for processing. These screens include consistency with the Forest Plan, consistency with laws, regulations, orders, and policies of National Forest System lands, and consistency with the purposes for which lands are managed or with other uses. Further criteria require that the applicant is qualified financially and technically to complete the project, and does not have a delinquent debt owed to the Forest Service. The regulations provide for denial of proposals that do not meet these minimum criteria.

Another factor that has affected the number of authorizations processed is the availability of funding to complete environmental analysis of proposals that are accepted for processing. Regulations that would provide for the collection of a processing fee have been proposed but not finalized. Until these regulations are finalized, the number of authorizations processed each year will be limited by the amount of appropriated funding for the special uses program that can be devoted to the processing of new applications.

The emphasis in special uses administration on the Forest is focused on administration of existing uses. Proper collection of fees due for special use authorizations, transfer of permits upon change of ownership, and resolution of permit non-compliance issues are the emphasis items.

Field inspection of permit uses is focused on health and safety issues, with first priority given to ensuring compliance with the bear Food Storage Order and monitoring of public service uses. Field inspection of items other than those involving health and safety occurs primarily in conjunction with on-going field work of other program specialists. Any permit non-compliance issues, which are discovered in this manner, are resolved through administrative permit actions.

Soil Resource

1. Soil Erosion

Programmatic monitoring related primarily to effects of the transportation system.

Specific qualitative and quantitative project monitoring occurred on timber sales, livestock grazing allotments, prescribed fire projects, wildfire burns, highway reconstruction projects, special use permit areas or sites and recreation areas or sites.

Soil erosion modeling, using a computer model called WEPP (Water Erosion Prediction Project), was used in the analysis of several projects during the year. This modeling is quantitative and provides output on relative estimates of erosion and effectiveness of prescribed watershed conservation practices.

In addition to programmatic and project monitoring, database development efforts initiated in previous years continued.

Evaluation

The water resources section of this report provides full discussion on evaluation of programmatic and projects monitoring, and database development mentioned above.

Use of WEPP is increasing agency wide as model development matures. The model provides useful project effects information in a relative sense, but because this information is based on calculated assumptions, there is a need to monitor site-specific projects so that model assumptions can be validated.

2. Soil and Water Resource Improvement (Improved Watershed Conditions)

Several watershed improvement projects were implemented during fiscal year 2001. The Forest continues to focus its efforts on reducing impacts of the transportation system on watershed condition, which is tied to recent transportation and stream health assessments (reference past Monitoring and Evaluation Reports).

Evaluation

Forest personnel are actively adjusting the watershed improvement program in response to policy and budget changes discussed in last year's report. The desired outcome of these adjustments is to have projects on a three-year schedule. In a general sense, year one will be used for assessment and design, year two will be used for environmental analysis and contract preparation, and year three will be used for project implementation. Until this schedule is fully implemented, there will be some projects over the next few years that will go from assessment to implementation in a shorter time frame in order for the Forest to meet yearly congressional targets. Because much of the watershed improvement program is designed to reduce or eliminate erosion and sediment delivery from the transportation system, public involvement is expected to be extraordinary. Depending upon the level of interest that develops, implementation of individual projects could thus be delayed, affecting the three-year schedule accordingly.

A final field survey was conducted on the Wapiti Ranger Station bank stabilization project. This information will be used in a final monitoring report to be submitted to the Army Corp of Engineers in fiscal year 2002.

Major projects designed to disconnect roads from waters of the U.S. were implemented in the Gooseberry Creek and Sheep Point areas on the Greybull Ranger District, and along a portion of the Warm Springs Creek Road on the Wind River Ranger District. Effectiveness monitoring on these projects will occur in fiscal year 2002.

Effectiveness monitoring of recent road disconnection projects occurred in the South Pass area of the Washakie Ranger District. Project objectives of reducing erosion and amounts of sediment delivered to streams are being met.

Three areas were identified with erosion control/reclamation issues that need to be investigated. One area is along an old road that leads to the former Sunlight Creek bridge; another area is at the Dead Indian summit overlook; the third area is east of Dead Indian Pass within the reddish colored and highly erosive Chugwater formation. These areas will be evaluated over the next few years and could potentially develop into watershed improvement projects.

An interagency review of reclamation practices implemented during reconstruction of the Chief Joseph and Buffalo Bill Scenic Byways occurred in mid-July. Vegetation species establishment, noxious weed control, and erosion control were evaluated. Grass species used, for the most part, were successfully established, and developed into a coverage that resembles adjacent plant communities. Cicer's milkvetch (a nitrogen fixing legume) was used to help improve soil fertility. This species was predicted to be short-lived; instead it has achieved substantial coverage and is out competing the planted grass species within the right-of-way zone. Some spread is occurring to adjacent native plant communities and just recently

has been found in Yellowstone National Park. In fiscal year 2002, small herbicide treatments are planned to reduce this plant's coverage and to release existing grass species.

Noxious weed introduction and spread is a major concern along the Buffalo Bill highway. Spotted knapweed, leafy spurge, and white top are becoming established along the roadside and at trailheads. Small patches have been treated the last two years, up to three times during the growing season, to eliminate new seedling establishment and prevent seed spread. Continued efforts are planned in fiscal year 2002.

An invasive species of concern is yellow sweet clover. This plant was used in past highway reconstruction work and still persists due to long-lived seed banks in the soil. This species is currently moving off the road right-of-way. Discussions on potential methods to control its spread continue.

California poppy was accidentally added into a seed mixture used in the Kitty Creek area. This occurred despite seed testing by the State of Wyoming. This species will be monitored in fiscal year 2002 and if it becomes established, a treatment program will be implemented.

Effective weed treatment along this highway is difficult due to the use of forbs and shrubs in the planting schemes. Use of herbicides is limited to spot spraying and great care needs to be taken to avoid killing non-graminoid species. Monitoring efforts indicate a need to include more proactive steps toward noxious weed treatment and control in future reclamation efforts.

The 80-acre Cabin Creek fire area, which burned in the spring of 2000, was rapidly invaded by dalmation toadflax. Treatment, using Plateau herbicide, occurred in the fall of 2000 and 2001. While this treatment was successful in dramatically reducing the coverage of dalmation toadflax, monitoring indicates aerial application by helicopter would have been a more practical application technique. There are two reasons: to obtain even spread of herbicide on rough terrain, and cost. Uneven spread of Plateau can cause grass mortality and stunting of growth. Relative to this project the cost of the ground-spraying program was \$24,000. It is estimated that an aerial application would have cost approximately \$10,000 and would have provided better consistency in coverage.

Noxious weed spread and infestation continue to be mapped forest-wide. Spotted and diffuse knapweed, houndstongue, musk thistle, and common tansey were found in small patches in several areas of the Forest. These small patches have been treated the last two years, up to three times during the growing season, to eliminate new seedling establishment. Continued efforts are planned in fiscal year 2002.

3. Soil Survey

Work on a soil resource inventory that began in 1988 and covers the Clarks Fork, Wapiti, Greybull, and Wind River Ranger Districts continued in fiscal year 2001. This inventory is being conducted in cooperation with the Natural Resource Conservation Service (NRCS) and their national soil survey program.

Soil resource inventory on the Washakie Ranger District was started in the late 1960s and early 1970s as part of the Fremont County (Lander area) survey. The survey was published in 1981. Remapping was scheduled as part of the present inventory, but funding was shifted into other regional priorities. In lieu of remapping the Washakie Ranger District, the Forest is now modifying the Forest portion of the Lander area survey as part of the Integrated Resource Inventory (IRI). Once completed the Forest will have a consistent forest-wide soil survey.

Evaluation

As discussed in last year's report, the fieldwork portion of the soil resource inventory is complete except for the Lander area remapping. Map work and NASIS database development was scheduled to conclude in fiscal year 2001; map work was completed, but some of the NASIS database work was not completed. Completion is now scheduled for fiscal year 2002. Once completed, the final step in the soil survey will be certification by the NRCS.

Modifications to the Lander area survey are also scheduled to be completed in fiscal year 2002. However, this work will not be accepted by the NRCS as an updated soil survey, because it will not meet national survey standards. However, it will be very useful to management of the Forest.

Roads

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

Programs such as the Capital Investment Program (CIP), Deferred Maintenance Program (CMII), and 10 percent Fund (TRTR) positively contributed to road reconstruction activities in fiscal year 2001, resulting in improvements to and reduction in deferred maintenance backlog on 19.5 miles of Forest Service collector roads. Additionally, 0.8 miles of local road was constructed for the new Rex Hale Campground, constructed under the direction of the Wyoming Department of Transportation, in conjunction with reconstruction of US 14/16/20 (Buffalo Bill Scenic Byway). The old Rex Hale Campground was effectively obliterated during reconstruction of the highway.

Road reconstruction/construction activities and outputs for fiscal years 2001 – 2010 were projected in Table III-1 of the Forest Plan, and are shown below.

Road Reconstruction	3.5 miles Collector	4.0 miles Local
Road Construction	1.1 miles Collector	3.4 miles Local

Evaluation

Accomplishments in fiscal year 2001 represent a significant increase in the average annual collector road reconstruction miles projected in the Forest Plan. This increase is primarily due to the availability of Regional TRTR funds. The 10 percent fund program return to Forests was implemented after the 1986 Forest Plan. The funds are used to improve watershed condition and health and safety directly related to transportation facilities.

While some programs introduce additional funds for road construction and reconstruction, the appropriated budget for these activities has remained fairly consistent, if not dipping slightly. The programs mentioned above will continue to offer funding opportunities to improve and repair Forest roads, reducing the deferred maintenance backlog and providing improved user safety and watershed condition. It is anticipated that heavy maintenance and improvement of local and collector roads will continue to be emphasized.

The timber sale program will continue to utilize, maintain, reconstruct, and construct Forest roads as needed to manage and protect resources.

The Forest policy of no net increase in roads will continue to guide transportation decisions and emphasize reconstruction over construction.

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

No local roads were closed in fiscal year 2001 after completion of timber sale or other activities.

Evaluation

Table III-1 in the Forest Plan estimated 99 miles of roads would be closed between 2001 and 2010. The Forest has exceeded this projection. The Forest will continue efforts to evaluate Forest roads and to identify roads for potential decommissioning.

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

No roads were obliterated (decommissioned) in fiscal year 2001. Appropriate environmental analysis and documentation needed to implement decommissioning was not complete and associated funds were turned back to the Regional Office.

Evaluation

The Forest Plan (Amendment 94-001) projects an average annual of 4.5 miles of road to be decommissioned. Although no miles were decommissioned, significant progress was made toward future decommissioning efforts on the Forest via the Horse Creek Watershed Assessment, which was completed in fiscal year 2001. The assessment, which includes a roads analysis, identified roads for decommissioning based on factors including resource damage, forest health improvement, expectation of roads needed for administration of National Forest System lands and minimizing costs for transportation system maintenance. Annual watershed assessments will help sustain decommissioning goals on the Forest and will encourage continued completion of environmental analysis to implement decommissioning. It is anticipated that future decommissioning will meet or exceed the Forest Plan expectation.

The Forest policy of no net increase in road miles will continue. As mentioned under item 1 above, 0.8 miles of new road were constructed in fiscal year 2001. This mileage replaces the old Rex Hale Campground road that was actually obliterated before fiscal year 2001 because of the highway reconstruction. Therefore, there is no net gain in miles.

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

Maintenance was accomplished on 60 miles of Maintenance Level 1 roads (closed roads). There were 121 system miles of Level 1 roads on the Forest road inventory at the end of fiscal year 2001. Forest personnel monitored the effectiveness of road closures. The results indicate a need for increased signing, implementation of maintenance level objectives, and enforcement of closures.

Evaluation

Previous decommissioning and proper classification efforts have reduced the Level 1 road system from the Forest Plan level. Maintenance accomplishments exceeded the Forest's adopted policy of completing 25 percent of Level 1 Road maintenance annually. Completion of deferred maintenance condition surveys and real property inventories helped to exceed the goal.

Priority is given to Maintenance Level 3, 4 and 5 roads, which are maintained for passenger car use, where public health and safety are a significant concern. Current budgets do not allow for maintenance of all Forest roads annually. Since priority is given to higher-level roads, less is spent on Level 1 roads.

It is expected that deferred maintenance surveys and verification will continue at a minimum level of 20 percent of total road miles annually. These surveys meet the basic Level 1 road maintenance criteria.

Protection

1. Fuels Treatment Target

The fuels treatment program on the Shoshone National Forest involves reduction of both natural fuels and management activity generated fuels. Natural fuel reduction focuses on vegetation exceeding natural volumes based on the assumption of natural disturbances and agreed to thresholds. Activity fuel reduction focuses on human activities which generate wood debris such as logging, tree thinning, and road right-of-way clearing. Forest Plan standards and guidelines for activity-generated fuel provide direction to reduce or treat fuels so the potential fire line intensity will not exceed 400 BTU/sec/ft (4 ft flame length) during

90 percent of the normal fire season. There is also direction to isolate continuous fuel concentrations or provide additional protection. The measurement frequency for natural and activity fuel treatment is the annual planned target +/- 25 percent.

Evaluation

The 2001 natural fuel treatment target was 4822 acres, the natural fuel-planning target was 8,000 acres, and the archaeology survey target (for fuels projects) was 15,061 acres of Class II survey (walk through) and 260 acres of Class III survey (intensive). The Forest accomplished 65 percent of the treatment target, 100 percent of the planning target, and 100 percent of the archaeology survey target. All treatments satisfied the Forest Plan standard and guidelines. Also, specific project goals and resource objectives, such as fuels reduction, preparing for fire use, and wildland/urban interface protection, were evaluated for each fuel reduction project. Using the same measurement frequency, all goals and objectives for fuels treatment projects were satisfied.

2. Fire Management Effectiveness Index

The fire management effectiveness index is a tool that measures the relative effectiveness of fire protection by comparing funds expended on staffing suppression resources with resources lost. The analysis determines the Most Efficient Level (MEL) of suppression capabilities. MEL is based upon cost of preparedness and suppression plus the net change in value of the resources. The current model used is the National Fire Management Analysis System (NFMAS). This analysis is completed every five years and is based on data collected the previous 10 years. Historically, the Fire program has been funded at levels significantly less than MEL. The 1999 NFMAS analysis defined MEL on the Shoshone NF as:

- Five hand-crews – one per district (three firefighters/five days per week, two firefighters/two days per week)
- Three Type 6 engines – one each at Crandall, Wapiti, and Dubois (three firefighters/six days per week, two firefighters/one day per week)

Evaluation

In 2001, Congress specifically directed and funded the Forest to implement MEL at 100 percent (\$1,050,000). The decision was made on the Shoshone National Forest to modify the implementation of MEL to account for long distances between engines and increase capability to implement fuels program targets. The modification is as follows:

- Three hand crews (Cody, Crandall, Dubois)
- Five engines (Wapiti, Sunlight, Timber Cr., Dubois, and Lander)

The Forest accomplished the task of hiring 100 percent of the identified positions. This included hiring 27 new positions of which 16 have permanent appointments of some type.

Recommendations for Revision/Amendment

A review of the Forest Plan is suggested to assure that appropriate level of soil, water, and air protection is being afforded related to fuels treatment and use of prescribed fire. It is recommended that this review occur as part of the Forest Plan revision.

As discussed in previous monitoring reports terminology needs to be consistent with current policy (e.g. the Federal Wildland Fire Management Policy & Program Review (1995), and the Wildland and Prescribed Fire Management Policy (1988)).

The ability to utilize wildland fire use outside wilderness should be analyzed in an amendment or at revision. Concurrent with this analysis the constraint in the standards and guidelines of 1,000 and 2,000

acres on wildland fire use inside wilderness should be analyzed. The value of natural fire ecology on all lands should be paramount in all land management decisions.

Air Resource

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 near South Pass City, Wyoming. Some sample analysis (e.g. - pH and conductivity tests) was performed in the Lander office laboratory. Consistent with NADP sampling protocol, samples were then sent to the Central Analytical Laboratory in Illinois for further chemical analyses. Data has been collected at this site since 1985 and is available at the NADP website (<http://nadp.sws.uiuc.edu>).

Air quality related values (AQRVs) were monitored at two lakes in Class I and Class II wilderness areas: Ross Lake in the Fitzpatrick Wilderness and Lower Saddlebag Lake in the Popo Agie Wilderness. Monitoring is being conducted to assess the effects of acid deposition on water quality. Water samples, as well as zooplankton and macroinvertebrate samples, were collected at both lakes. Each lake is sampled three times between early summer and late fall.

The Bridger-Teton National Forest also collects bulk deposition (precipitation) samples at Hobbs and Black Joe Lakes in the Wind River Mountains. These data have been collected since 1986. Data from bulk deposition sampling is displayed in annual summary reports submitted to the Wyoming Department of Environmental Quality (DEQ).

The National Outdoor Leadership School (NOLS) did not perform additional AQRV wilderness lake sampling for the Forest Service in the Wind River Mountains this year. They have requested and received lake chemistry data from the Forest and are having their research group conduct an independent analysis of this data.

In January 2000, an IMPROVE (Interagency Monitoring of Protected Visual Environments) station was installed at Dead Indian Pass, financed by the State of Wyoming. This station includes aerosol monitors and a nephelometer. Aerosol filters are changed weekly and sent to the University of California at Davis for analysis. Data are then quality assured by the National Park Service and made available to the public. IMPROVE program staff have developed a website to share collected information with federal and state agencies and to provide information to the public. The URL for this site is <http://vista.cira.colostate.edu/improve/>.

The Forest Service continues to review NEPA work being conducted by the BLM for proposed large-scale oil and gas developments in southwest Wyoming, developments that may have a direct impact on Class I areas in the Wind River Mountains. This includes monitoring impacts from two large projects, the Continental Divide/Greater Wamsutter II natural gas development, and the Pinedale Anticline oil and gas development, which were authorized for development in 2000. The Forest Service was a cooperating agency during the completion of the air quality analysis for the Pinedale Anticline project.

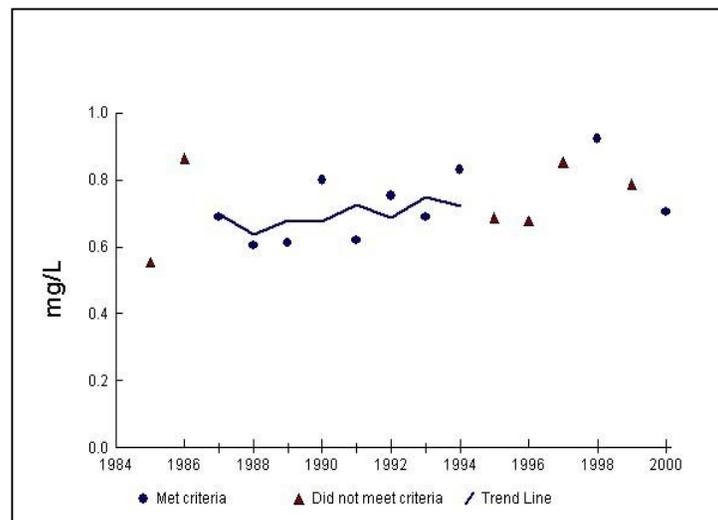
The Forest Service is also involved with the Greater Yellowstone Area Clean Air Partnership (GYA-CAP), established to identify and address key issues relating to air quality in the Greater Yellowstone Area. The partnership allows for an exchange of information and improved dialog between state and federal agencies working in the GYA.

Evaluation

The South Pass NADP site is funded primarily by SF Phosphates as part of their Wyoming DEQ Prevention of Significant Deterioration (PSD) permit. Summaries and trend analysis for this and other NADP sites are available on the Internet at <http://nadp.sws.uiuc.edu>.

DEQ and other agencies continually analyze these data. cursory analysis of the South Pass NADP data shows a slight trend toward increasing levels of NO₃ and inorganic nitrogen in recent years. The Southwest Wyoming Technical Air Forum (SWWYTAF) has incorporated NADP data into the CALPUFF model, which is used to model and track emissions and acid deposition across southwestern Wyoming. The Forest will continue monitoring this important site.

Figure 17. Annual inorganic N depositions, 1985-2000, Site WY97 South Pass City



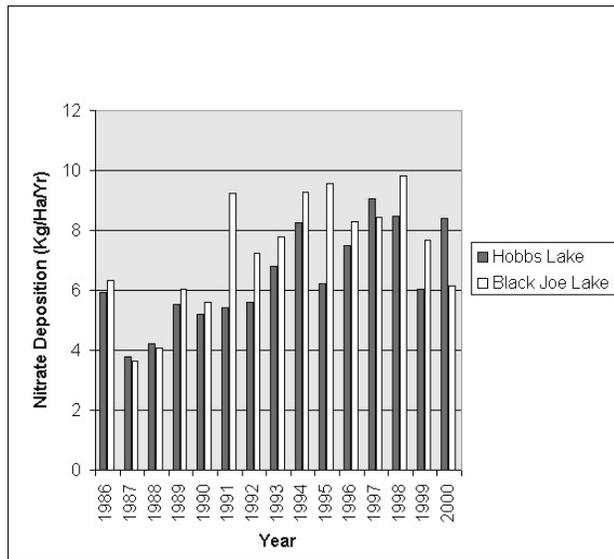
Based on current data, there does not appear to be a trend in the chemical composition of the lakes being sampled. However, because these lakes are sensitive and susceptible to change from acid deposition, the Forest will continue to monitor both lakes. Continued monitoring of these lakes will allow development of a database sufficient to conduct quality statistical analysis where general trends indicate increased nitrate, sulfate, and phosphate concentrations as well as increased acidification. A need to monitor additional sensitive lakes in future years may be necessary as additional data from the existing lakes is collected and analyzed.

The independent data analysis being conducted by NOLS will serve as a quality control check on Forest Service work.

Bridger-Teton National Forest personnel are entering AQRV lake monitoring data from the Shoshone National Forest into the Natural Resource Information System (NRIS) air module. The new version of this corporate database (v1.1) is now available, and should be installed on the Shoshone in 2002. This information will be available in the future on an Internet site. These data continue to be evaluated by personnel at the National Biological Survey at Colorado State University in Fort Collins, Colorado.

The IMPROVE site at Dead Indian Pass, installed in January 2000, continues to be operated. Baseline data for the site will be collected for three years at which time additional monitoring will help detect changes in air quality and visibility.

Figure 18. Data from the Bridger-Teton bulk deposition sampling indicates a general trend of increasing total nitrate deposition (in kg/ha/yr).



The Continental Divide/Greater Wamsutter II natural gas development is located between Rock Springs and Rawlins, Wyoming. The development of 1,065 wells and associated ancillary facilities was authorized by the BLM in 2000. Air quality modeling suggests no impact would occur from this project alone. However, the cumulative impact of this project and other development which is either occurring or will occur in the reasonably foreseeable future could potentially impact visibility in the Rawah and Savage Run Class I wilderness areas one to two days per year at the 0.5 deciview level.

The Pinedale Anticline oil and gas development is located on the west side of the Wind River Mountains near Pinedale, Wyoming. The development of 700 wells over the next ten to fifteen years was authorized by the BLM in 2000. Air quality modeling, conducted to assess the effects of this development on adjacent Class I and Class II wilderness areas, suggests no impacts would occur from this project alone. However, modeling suggests the cumulative effects of this project, coupled with existing emissions and potential emissions from reasonably foreseeable future projects, could potentially impact the adjacent wilderness areas. For the scenario with the highest development and emission rates, modeling indicates visibility impairment could occur from 11 to 15 days per year at the 0.5 deciview level, affecting the Bridger and Fitzpatrick Class I wilderness areas, the Wind River Indian Reservation Roadless Area and Popo Agie Class II wilderness area.

Project proponents (Ultra Petroleum) financed the installation of low NO_x burners at the Naughton power plant near Kemmerer, Wyoming and reduced their permitted levels of NO_x emissions by 1,000 tons per year. The Forest Service believes this off-site mitigation is sufficient to offset the modeled impacts. The BLM's Adaptive Environmental Management Process (AEM), which monitors the actual effects of this development on air quality and validates the modeling that was done for this project, has been discontinued due to legal concerns. However, the Forest Service is actively involved with the BLM, Wyoming DEQ and local citizens to monitor impacts from this project. Monitoring is done to confirm that the impacts from this project are within the range described in the NEPA documents. These monitoring efforts will continue in the future.