SHOSHONE NATIONAL FOREST

MONITORING AND EVALUATION REPORT

FISCAL YEAR 1996

CERTIFICATION

I have reviewed the Shoshone National Forest annual Monitoring and Evaluation Report for fiscal year 1996. Analysis associated with project implementation under the Forest Plan indicates that the Shoshone National Forest Land and Resource Management Plan, as currently amended, is sufficient to guide implementation through the coming year.

Several changes to the monitoring requirements in the Forest Plan were recommended in the 1995 report. These include changes to the data sources/techniques used to monitor or, in some cases, changes to the monitoring item itself. Changes are intended to improve monitoring and to clarify results. These changes will be addressed in an amendment to the Forest Plan currently in progress.

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INTRODUCTION

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

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

The following report evaluates Forest Plan implementation during fiscal year 1996. Additional multi-year data is presented in some cases in order to provide perspective on the current state of Forest Plan implementation. In addition, this document includes a trend analysis section in the appendix which responds to item 13 of the Order of Dismissal of lawsuit No. USDC-WY-96-CV-010-D, Wyoming Outdoor Council, et.al. v. Elliott, et.al. In this item, both parties agreed that the Shoshone National Forest would, to the extent feasible, include trend analysis of fourteen items in the 1996 Monitoring and Evaluation Report.

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

This report evaluates Forest Plan implementation under 47 criteria from the 1986 Shoshone National Forest Plan as amended. The report concludes with the interdisciplinary team recommendations to the Forest Supervisor. Some of the recommended changes may be implemented through Forest Plan amendment or revision which will begin within the next two years.

FOREST PLAN

Actual Costs of Applying Management Direction from the Forest Plan

The actual costs of applying management direction are monitored by comparing actual Forest budgets with Forest Plan projections. Table 1 is a comparison of the projected Forest Plan budget with what it has actually been from 1987 to 1996. In 1996, the total allocated budget was 66% of what was projected. Two budget amendments to the Forest Plan have been made since the Plan was published to correct omissions and changes in workload.

Evaluation

The Shoshone National Forest's total budget for 1996 is fairly close to what it was in 1995. However funding for individual items varies greatly in some cases. Funding for law enforcement, the range program, soil and water, the lands program and trail construction, for example, are considerably lower than they were in 1995. Funding for other programs, such as fire management, minerals, timber and cultural resources, on the other hand, is up from 1995. Fluctuations like this occur annually based on a variety of factors including the current Congress' priorities, therefore it is somewhat more useful to note a long term trend than to compare year to year.

In general, Forest Service budgets are decreasing as the Federal government attempts to deal with the federal deficit. This trend is not expected to change anytime in the near future. The Shoshone, like other Forests, is looking to alternative sources of funding to carry out its mission. These include, partnerships with other agencies or groups, concessionaires, contracting work, cost-share programs and volunteers.

TABLE 1: FOREST BUDGET IN THOUSANDS OF 96 $

Activity	Forest Plan	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
LAW ENFORCEMENT	25.98	24.55	24.20	24.54	23.00	35.96	19.40	12.72	14.25	14.28	31.90
CULTURAL RESOURCES	102.54	65.84	21.66	35.16	36.69	50.39	73.68	98.47	85.38	82.42	49.10
ECOSYSTEM MGMT											
ECOSYSTEM MGT CN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ECOSYSTEM MGT NF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.14	1,110.20
ECONOMIC DEVELOP	0.00	0.00	0.00	0.00	0.00	0.00	27.25	15.90	0.00	0.00	0.00
FACILITIES											
FACILITIES CONSTR	156.40	0.00	0.00	6.25	77.17	64.91	254.19	579.38	0.00	0.00	0.00
FACILITIES MTCE	295.66	87.79	63.40	151.51	76.36	88.36	124.91	43.46	63.23	83.74	103.20
FEDERAL HIGHWAY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.58
ROAD CONST GENERAL	753.44	0.00	787.59	126.97	94.76	307.69	165.68	60.95	45.03	51.92	0.00
ROAD CONST RECREATN	19.04	0.00	22.51	66.67	6.33	17.21	153.91	153.91	447.51	42.64	134.40
ROAD CONST TIMBER	74.80	0.00	180.29	114.93	110.75	102.23	117.50	256.41	24.13	3.98	12.30
ROAD MTCE	693.87	245.15	207.76	236.35	236.21	271.95	196.20	102.50	167.65	179.42	203.90
FIRE MANAGEMENT	155.72	201.13	113.26	163.67	32.78	245.31	334.63	367.93	309.71	291.72	475.30
GENERAL ADMIN	1,340.28	1,157.04	1,036.97	1,058.46	1,313.41	1,302.03	1,326.64	1,175.22	1,243.01	1,108.03	1,085.00
KNUTSON/VANDENBRG	44.88	83.20	96.32	77.53	66.93	28.31	57.66	14.73	42.43	2.24	175.30
LANDS											
LANDS - GENERAL	162.25	82.09	71.39	86.73	90.28	132.31	156.52	106.74	123.14	126.89	118.80
LAND LINE LOCATION	26.25	3.97	17.55	20.06	21.51	25.97	28.23	4.77	2.81	8.87	2.60
LAND/WATER CONS FND	31.28	0.00	0.00	0.00	0.00	0.00	5.23	0.00	0.00	0.00	3.80
MINERALS	221.54	184.39	91.96	116.58	94.53	130.87	253.10	142.89	81.74	56.30	69.20
RANGE											
NOXIOUS WEEDS	2.72	3.84	0.00	0.00	0.00	0.00	3.49	9.01	4.68	8.98	7.90
RANGE ADMINISTRATION	374.82	272.55	268.02	276.71	314.64	331.45	390.44	289.59	292.76	239.80	266.20
RANGE IMPROVEMENT	80.78	28.89	37.75	0.00	4.71	28.75	29.32	19.72	22.67	30.80	33.40
RECREATION											
RECREATION CONST	266.42	0.00	51.30	103.49	39.56	151.74	150.64	0.00	169.21	0.00	23.10
RECREATION	926.70	510.51	697.69	821.52	887.92	1,404.04	802.24	882.98	952.22	820.49	883.30
SOIL AND WATER											
SOIL & WATER ADMIN	196.11	130.08	71.75	21.71	68.20	183.26	36.52	257.26	200.62	191.66	78.60
SOIL & WATER IMPROVE	205.09	0.00	12.71	7.20	30.13	55.61	5.45	0.00	37.75	48.96	50.00
SOIL INVENTORY	197.20	0.00	61.35	214.76	146.97	202.69	245.90	293.51	204.67	301.61	0.00
T & E ADMIN	386.24	279.12	118.34	141.95	194.70	287.05	282.96	270.09	264.37	289.07	271.20
TIMBER											
TIMBER ADMINISTRATION	83.23	157.36	144.72	182.43	239.20	388.39	200.89	17.17	81.85	143.92	280.00
TIMBER EXAM	66.10	47.00	0.00	38.94	58.77	61.27	36.95	11.34	22.15	19.99	0.00
TIMBER IMPROVEMENT	46.92	64.98	39.57	39.18	33.93	2.11	30.52	2.33	36.82	62.42	0.00
TIMBER PLANNING	181.29	66.96	32.55	17.70	34.39	94.24	270.54	110.77	147.26	43.35	0.00
TIMBER PREPARATION	164.56	256.31	224.33	278.13	158.01	111.22	159.90	135.57	65.94	40.19	0.00
BRUSH DISPOSAL	23.12	33.60	19.84	13.69	9.09	3.89	11.77	3.92	3.02	8.16	3.30
INSECT & DISEASE MGMT	0.00	20.09	30.98	35.52	21.39	111.56	50.90	11.98	0.00	0.00	0.00
REFORESTATION	14.96	0.00	4.84	39.18	6.21	38.74	233.04	165.68	189.90	155.45	109.90
SALVAGE SALE FUND	111.52	52.58	79.62	177.71	84.64	296.37	234.46	221.65	188.55	312.94	433.20
TRAILS											
TRAIL CONSTRUCTION	558.96	30.63	135.64	93.46	362.37	123.99	54.83	144.90	9.26	106.18	50.10
TRAIL MAINTENANCE	342.72	102.92	466.21	234.35	204.35	236.10	285.69	252.17	343.51	296.31	0.00
WILDERNESS	379.44	261.14	156.70	95.34	132.14	782.44	255.06	245.18	171.18	193.29	382.30
WILDLIFE AND FISH											
WILDLIFE ADMIN	430.44	206.21	193.72	273.64	388.36	470.31	429.57	329.02	258.75	273.16	186.20
FISH	158.58	0.00	0.00	0.00	0.00	25.09	103.22	119.89	80.70	215.53	56.10
TOTAL	9,301.86	4,659.92	5,582.46	5,392.01	5,700.32	8,193.77	7,599.04	6,929.74	6,397.87	5,856.84	6,699.38
% OF FOREST PLAN	100	50	60	58	61	88	82	74	69	63	72

RECREATION

In 1996 the Shoshone National Forest began work on several nationwide Forest Service initiatives to help recreation managers better implement and monitor quality recreation experiences and facilities. Generally these initiatives involve establishing a database to record all developed and dispersed recreation sites, their condition, visitor occupancy rates, and their cost of operation. The "Meaningful Measures" and "Infrastructure" programs are currently on the Forest and baseline data entry is complete.

The Forest's GIS database continues to grow and improve. Recreation personnel continue to validate and consolidate recreation site and roads data (from a variety of mapping sources) into one combined data base.

This gathering of information is integral to the management of the recreation program on the Forest and will facilitate a comprehensive recreation monitoring program for the future. Although these systems were not online to steer last year's monitoring plan they will be used during the upcoming summer season.

1. Off Road Vehicle Use of Designated Travelways

Off road vehicle (ORV) use is prohibited on the Forest except for travel on designated roads (signed with white arrows and/or Forest road numbers) and snowmobiles travelling on snow where permitted. The use of Off highway
vehicles (OHV), both legal and illegal, continues to increase on the Forest, following the national trend. Off highway use is monitored whenever possible through observation and inspection.

As noted in the 1995 Monitoring Report several areas are of particular concern to Forest personnel. The areas of concern that were identified in the winter of 1995/1996 were incorporated into the 1996 monitoring plan. Areas of concentrated monitoring for the 1996 use season are listed below by District.

Evaluation

Washakie District:

The South Pass area was monitored on a weekly basis throughout the summer by Forest personnel. Use remained consistent with 1995 levels. Law enforcement patrols were made on a regular basis throughout the summer season. Although no increase in use was noted, District personnel still found it difficult to respond to the overall level of OHV use on the District.

Wind River District:

Patrols by Forest Service Law Enforcement personnel indicate that use in the Union Pass area continues to increase. Interviews with OHV users at the site indicate that OHV operators are often confused by the existing signing or lack of signing in certain areas. Ensuring the public is aware of areas open or closed to travel helps reduce OHV use problems. The south zone of the Forest (the Washakie and Wind River districts) has been actively working on signing roads using the "white arrow" system. Once signs are in place they will communicate to the public where they should be and allow Forest personnel to write violation notices. Violators are not cited if the Forest has not made it clear what is open and closed. Signing remains a top priority on the district. The Wind River District experienced very low levels of staffing making it difficult to maintain their identified 1996 monitoring program.

Wapiti District:

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

OHV use on Carter Mountain continued to increase in 1996. Erosion problems were noted on the east end of Carter and on the Belknap timber sale road. The erosion is caused for the most part by OHV use during wet periods. ORV use on private property adjacent to the Forest continues to be a problem on Carter Mountain. Private property boundary signs were placed in the summer of 1996. Carter Mountain was identified as an area where regularly scheduled monitoring patrols during the 1997 use season would be appropriate.

Problems on Logan Mountain and Blackwater Creek have been greatly reduced by locking gates and installing "no travel" signs. Strict enforcement of the road closure and monitoring of existing resource damage will continue in 1997.

Resource damage has been noted along riparian areas in Elk Fork Creek. The majority of damage to this area is being caused by OHVs operating during wet periods. It is recommended that Elk Fork be monitored closely in the 1997 use season. It may be necessary to close the road when it is wet and the ground is unstable to prevent resource damage.

Off road travel on Clocktower road had created multiple roading and erosion problems. In the summer of 1996 a gate and sign were placed at the end of the established road system. As of July 1996, no vehicular travel has occurred beyond the gate. As with the Logan and Blackwater Creek areas, enforcement patrols and an erosion assessment will be continued in 1997.

During the summer use season Forest personnel issued 7 violation notices and 2 incident reports concerning off road vehicle use on the Wapiti District.

Clarks Forks District:

In the summer of 1996 Clarks Fork District personnel identified 8 areas of concern; Bald Ridge, Upper Sunlight Creek, Russell Creek, Clarks Fork Canyon, Table Mountain, Crazy Lakes Trail, Clay Butte-Absaroka Beartooth Wilderness, and the Fantan/Morrison Jeep Trails. Each of these areas was monitored throughout the summer by visual observation. Patrols were documented and violations and incidents were recorded.

The collected data indicates an overall increase in OHV use on the Clarks Fork District. Of particular note was the Bald Ridge area where over 60 vehicles a day were recorded during hunting season. The Morrison Jeep trail and the Upper Sunlight area also experienced an increase in OHV use, particularly among ATV users. Personnel constraints prohibited the level of monitoring required to adequately respond to existing use levels in the Table Mountain and the Clay Butte/Absaroka areas. Of 28 incident reports recorded on the Clarks Fork District between October and November of 1996, 12 were related to illegal off road vehicle use.

Greybull District

Volunteers at Sperry Cabin monitored vehicles in the area of the Kirwin town site on the Greybull District. The volunteers collected data by visual observation and recorded information in a daily diary. The information collected by the volunteers indicates an increase in the overall use of the

Kirwin area. Little additional natural resource damage was recorded, however observation indicates that the Kirwin properties are subject to increasing vandalism and theft.

Greybull District personnel have recorded an increase in complaints concerning ATV use on Phelps Mountain and in the Jack Creek area. During the 1996 hunting season an additional law enforcement officer was employed to patrol the District and help with illegal OHV traffic.

Although complaints were received concerning ATV use, no citations were issued during the summer use season. Funding for the 1996 season allowed funding for 1 part time seasonal employee to patrol dispersed areas.

2. Trail Condition

Summer Use Trails

Trail condition is monitored annually on the Shoshone National Forest and results in an annual trail maintenance program which is subject to funding levels. In general, trail maintenance is prioritized based on consideration of public safety and resource impacts.

There are approximately 1,459 miles of trails on the Shoshone. Motorized use is allowed on approximately 459 of these miles. In 1996, 760 trail miles were maintained to a standard level and 290 miles were maintained to a less than standard level (from Recreation Trail Information FY 1995 and FY 1996).

In 1996 the Forest implemented a formal Forest wide trails monitoring program. The monitoring goal for all Districts was 100% of all mainline trails during the 1996 season. In addition to the mainline trails, a sample of 50% of all secondary trails was to be monitored and the results documented. All monitoring data is to be kept on file within each of the District Offices.

Evaluation

Monitoring indicates that the Shoshone National Forest continues to have difficulty meeting the public demand for trails. An increase in use of trails coupled with declining budgets have made it difficult to maintain trails to an acceptable standard. As mentioned above, sections of trail that are unsafe receive first priority and those in bad enough shape to pose a safety threat at the beginning of the field season are not opened to the public until the trail crew can effect repairs. Sections of trail that are causing resource problems are a second priority and do not get consistent attention.

Varieties of use are also increasing. Outside wilderness new uses include mountain bikes, wheelchairs, runners, llamas and goats. Llamas and goats are used on wilderness trails as well. With each of these activities comes a separate set of maintenance challenges.

Trail condition for the 1996 use season as reported by District is as follows:

Wind River District

During the course of their routine duties Wilderness rangers and trail crew staff covered 100% of the mainline or primary trails on the Wind River District. Monitoring forms and photos were used to record the findings of the field crews.

A review of the 20 trail repair projects that were identified in the 1993-1996 Monitoring book for the Wind River District shows that nearly all of the projects identified in previous years still need to be

completed. Many of the inherent hazards are due to the terrain and can't be eliminated. Other identified problems are labor intensive and require more funding than the current budget will allow.

In 1996 a four person trail crew and two volunteer groups repaired significant damage to several high use areas. A major bridge was constructed by the trail crew, the Wilderness crew, and a contractor. Many areas of trail braiding are getting worse and will continue to deteriorate without significant attention. Lack of regular maintenance over the last 40 years has lead to significant erosion of tread material. Many small bridges and rock structures need replacing.

Washakie District

Wilderness rangers and trail crews monitored 100% of the mainline trails and 90% of the secondary trails on the District in 1996. Trails monitoring reports and photo documentation of problem areas were recorded for each trail segment. No monitoring of way trails took place due to limited staffing and the low amount of visitor use on these trails.

Nearly 40 documented trail projects are recorded in the District's Trail Project Inventory. The 1996 monitoring effort shows that almost all of these projects still need to be completed. Current budgets allow for only the most basic maintenance procedures such as cutting out fallen trees and cleaning water bars. Many structures such as small trail bridges and rock work need replacing. Budget and staffing levels do not permit the level of attention required to complete the identified trail maintenance.

Current trail maintenance on the District is completed by 4 seasonal Wilderness guards. The Wilderness guards are assisted by two 15 person volunteer crews. The volunteer groups completed heavy maintenance on two separate sections of trail. Although volunteer groups can complete heavy maintenance projects they do so with a high cost. The volunteers were found to require wide staff assistance that negatively affected other work groups.

Greybull District

Wilderness crews, trail crews and volunteers were able to monitor 43.7 miles (95%) of mainline trails, 125 miles (48%) of secondary trails and 110 miles (27%) of way trails on the Greybull District. Trails were monitored for overall condition, accessibility and resource damage. Field monitoring reports and photos of problem areas were filed at the District Office.

Field reports indicate that drainage problems and wear and tear on trail tread are the District's biggest problems. Many problems are inherent to the terrain and need annual maintenance to keep the trail passable. Many of the major tread problems are occurring because of high trail use during wet periods, particularly during hunting season.

Current trail maintenance on the Greybull District is done by one two person trail crew. The limited budget allows for only routine maintenance. Maintenance on the District in 1996 included removing fallen trees and the correction of small safety hazards. The Meeteetsee Recreation Crew is a group of high school students who complete projects on the District. In 1996 this crew was able to complete one heavy maintenance and several routine maintenance projects. The Sierra Club service trip completed a much needed heavy maintenance project on the Cow Creek trail.

Wapiti District

Trails on the Wapiti District were monitored for resource damage, safety hazards and accessibility. Field going District personnel and trail crews recorded their observations on trail monitoring forms and with photographs. Field crews were able to monitor 104 miles (100%) of mainline trail, 215 miles (92%) of secondary trails and 172 miles (74%) of way trails during the 1996 summer season.

The field data collected suggests that the majority of the trails on the Wapiti District are sub standard. Overall trails are maintained to a minimum level with only routine maintenance being performed. Mainline trails are generally not being maintained to standard (Level II management objective). Secondary trails are generally being maintained to standard (Level I management objective). Way, or primitive, trails are continuing to deteriorate.

Trails on the District appear to have reached a maintenance plateau. Crews are able to keep them open and maintained to their current level. As noted above, this level is generally well below the identified Forest Service standard for trail maintenance. This is particularly true of mainline trails.

Clarks Fork District

Trail crews on the Clarks Fork District monitored 40.5 (100%) of mainline trails, 162.4 miles (59%) of secondary trails, and 62.3 miles (41%) of way trails. Field data was recorded on trail monitoring forms and photographs.

Many of the same trends found on the Wapiti District are also found on the Clarks Fork. Mainline trails receive annual routine maintenance, however budgets rarely allow crews to maintain these trails to their identified management objective. Because the management objective is lower more secondary trails on the Clarks Fork are currently in compliance.

Use trends on the District indicate that day use and horse use in the Beartooth Mountains continues to rise sharply. Along with this rise in visitor use trail crews are recording a corresponding increase in maintenance problems.

Winter Use Trails

The Shoshone also experiences winter trail use. On the Clarks Fork District field personnel inspect the Clarks Fork snowmobile trail annually in the summer or fall. The trail is groomed through a cooperative agreement with the Park County Snowmobile Association and the Wyoming Division of State Parks. Copies of the trail maintenance logs are reviewed by Forest recreation staff and maintenance inspection is done by state park personnel.

The snowmobile system trails on the Wind River and Washakie Districts cover about 200 miles and connect with the system trails on the Pinedale, Jackson, and Buffalo Districts of the Bridger-Teton National Forest. The Continental Divide Snowmobile Trail (CDST) is a designated winter recreational trail that begins in Lander, Wyoming and traverses north across the Wind River Mountains to Grand Teton National Park. These trails are inspected annually by District personnel, local snowmobile organizations, and Wyoming Department of Commerce personnel for personal safety, trail reroutes, and additional signs. The Department of Commerce grooms the trails and the Forest, together with local volunteer groups, signs and stakes the trails. Trail counters are placed annually on several main trails to monitor use trends and, indirectly, trail condition as the two are somewhat related. Forest personnel also monitor use and facility condition through periodic inspection and feedback from users.

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

Nordic skiing and dog mushing are activities that also involve winter use on trails. These activities are growing in popularity. In some cases they have created safety hazards for all trail users. In addition to signing on most dual use trails to warn people of hazards, the Forest has encouraged dog mushers and nordic skiers to use separate areas and trails.

Evaluation

Winter trail use - snowmobiling, cross country skiing and backcountry skiing - continues to be the fastest growing segment of recreation use on the Forest. Some high use areas are experiencing deteriorated conditions. In 1996/1997 in response to the increase in snowmobiling on the Washakie and Wind River Districts the Shoshone committed over 265 days of personnel time to administering winter use.

Beginning in early December of 1995 Forest personnel on the Clarks Fork District monitored snowmobile use at the Pilot Creek trailhead. Concentrating on weekend use data was collected for the months of December, January (1996) and February. Total recreation visitor days for this time frame are estimated at 4,514. Weekends in December averaged 188 Recreation Visitor Days (RVDs), January weekends averaged 279 RVDs, and in February 336 RVDs were counted.

GYA Winter Visitor Use Assessment

The Shoshone National Forest has been represented on an interagency team charged with evaluating winter visitor use in the Greater Yellowstone Area. The team was chartered by the Greater Yellowstone Coordinating Committee (GYCC) in response to greatly elevated levels of snowmobile use in Yellowstone National Park, and a number of other issues that are, or could potentially, affect all eight Forests and Parks represented. The team performed an assessment of the current winter use conflicts that are occurring in the GYA. Issues include crowding, safety, air quality, wildlife impacts, community expectations, wilderness trespass, adequacy of facilities, and conflicts between different user groups. The assessment will be available for the public during the winter or spring of 1997. The conflicts identified on the Shoshone National Forest are tabulated below.

Table 2. Winter Use Conflicts: Shoshone National Forest. Type 1=Conflicts within a single user group; Type 2=Conflicts between user groups. Type 3=Resource impacts from users; Type 4=Trespass use

Map#	Area Name	Conflict Type	Comments/Description
21	AB Wilderness and High Lakes Wilderness Study Area	2,4	Moderate to high levels of wilderness trespass, and moderate to increasing levels of conflict between skiers and snowmobilers.
23	Beartooth Highway corridor	1,2	Low levels of conflict between skiers and snowmobilers, except in selected areas. Risk of conflict is increasing.
52	Pahaska	1,2,3,4	High level of conflict. Insufficient parking. Safety hazard due to moving cars, snowmobiles, snow sliders, skiers, lodge visitors, bison in a confined area. Potential human/grizzly conflicts from spring skiing/snowmobiling north of the lodge. Snowmobiling north of the lodge trespasses into the North Absaroka Wilderness.
53	Goff Creek to Pahaska	2,3	Safety hazard due to moving cars, snowmobiles, snow sliders, skiers, bison. Risks increasing.
55	Blackwater to Pahaska	1,2,3	Low level of conflicting uses: skiing, snowmobiling and wildlife.
57	North Fork Highway	3	Winter pleasure driving, access to skiing, snowmobiling, bison on the highway increasingly represents a safety issue. Low level of conflict.
59	Kitty Creek	4	Low levels of wilderness trespass.
67	Upper South Fork	3	Ice climbing access conflicts with private lands, crucial winter range for bighorn sheep, elk, primarily. Occurring at low levels presently. Noncommercial ventures, NOLS instructors.
72	Teton/ Washakie Wilderness	4	Ridge riding - wilderness trespass at low to moderate levels.
77	Double Cabin	3	Low level of conflict with snowmachines in winter moose habitat.
80	Brooks Lake	1,2,3	High level of conflict between snowmachines and skiers, with the additional moderate impact of dog mushers. Crowding and wintering wildlife are other factors.

Table 2. Winter Use Conflicts: Shoshone National Forest. Type 1=Conflicts within a single user group; Type 2=Conflicts between user groups. Type 3=Resource impacts from users; Type 4=Trespass use **(continued)**

Map#	Area Name	Conflict Type	Comments/Description
86	Togwotee Highway	2,3	Same conflict assessment as in 80, with the added factor of parking. Parking area is insufficient; vehicles park along the road and represent a safety hazard along the highway for passing traffic and snow clearing vehicles.
87	Dunoir	3	Moderate impact on wintering elk by snowmachines.
89	Horse Creek to Fivemile	3	Moderate impact on wintering elk by snowmachines. Contains an area that is closed to motorized winter use except on designated routes, due to winter elk habitat.
92	East Fork	3	Impact on wintering elk by snowmachines at low levels. Contains an area that is closed to motorized winter use except on designated routes, due to winter elk habitat.
97	Union Pass/CDST	1,2	Low to moderate levels of conflict and crowding among skiers, snowmobilers, and dog mushers.
106	Warm Springs	3	Present low level of impact on wintering moose by snowmachines.
112	Fitzpatrick	4	Wilderness trespass.
116	Trail Creek	3	Impacts on bighorn sheep at low to moderate level.
131	Sinks Canyon	1,2	Snowmobiles on road, conflict between skiers and snowmobilers at moderate to high levels.
132	Blue Ridge	4	Moderate level of snowmobile trespass into the Popo Agie Wilderness
133	South Pass to Christina Lake	1,2	Low to moderate levels of skier vs snowmobiler conflict, periodically high usage by snowmobiles to the point of crowding and safety hazard.
177	Sunlight	3	Low levels of use. Represents an area that is closed to motorized winter use except on designated routes, due to winter wildlife habitat, and is a potential conflict area.
178	Bald Ridge	3	Low levels of use. Represents an area that is closed to motorized winter use except on designated routes, due to winter wildlife habitat, and is a potential conflict area.

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

These two monitoring items are dealt with together in this report because they are highly interrelated. The Forest Plan recommends that dispersed recreation use and experience be measured using the Recreation Information Management (RIM) system. Management is to be re-evaluated when use exceeds the Recreation Opportunity Spectrum (ROS) capacity guidelines for the management area prescription. Because the RIM system has been in a state of flux for the past several years, Forest employees currently monitor dispersed sites through observation and inspection and note use trends.

Forest Plan standards for campsite condition are stated in terms of Frissell Condition Class. Use of this system for monitoring proved to be un-workable as the Limits of Acceptable Change (LAC) process was undertaken on the Popo Agie wilderness. The modified Cole methodology proved much more descriptive and, as a result, more helpful in developing potential solutions to problems. Monitoring in accordance with this method has been applied primarily in wilderness backcountry sites (see Wilderness section).

The monitoring chapter of the Forest Plan (Chapter IV, Table IV-1) is currently being amended to reflect these changes in monitoring methodology.

Evaluation

In July of 1996, 23 areas were identified as problems and were scheduled for monitoring. Of the twenty three areas identified only 8 areas were actually inventoried. These are: Crandall Creek (3), the Point, Pilot Creek, The Rock, Willow Park, and Muddy Creek.

The Cole numerical ratings for the inventoried campsites indicate a range of degradation from moderate to high. None of the inventoried campsites received a Cole rating of "low degradation" or "pristine". Data indicates that development and cleanliness consistently receive high ratings. Several sites are approaching a rating of maximum degradation. Rehabilitation that removes developments and refuse will unilaterally improve the condition of all dispersed sites. The process for dispersed campsite inventory is very labor intensive. In order to inventory and rehabilitate targeted sites it will take one full time seasonal employee at least 3 months.

Of the inventoried sites Crandall Creek #1 on the Clarks Fork District should be considered first for rehabilitation management practices.

On the Wapiti District 5 separate areas were identified for dispersed recreation monitoring in 1996. The areas identified for inventory are Carter Mountain, Aldrich Creek, Corral/Aldrich Creek, Boulder Creek, and the North Fork Corridor.

The primary use season for the Carter Mountain, Aldrich Creek and Corral/Aldrich Creek is during hunting season. The dispersed sites in these areas are showing unacceptable levels of soil erosion and vegetation damage. Many of these campsites are located within grazing allotments. The dual use by cattle and humans is compounding the site degradation problem. Resource degradation has also been noted within the Boulder Creek area. Horses tied to trees appears to be the cause of the resource damage. The problems at Boulder Creek appear to have lessened due to diligent education of users by Forest personnel.

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

On the south end of the Forest areas identified as receiving heavy dispersed use in the 1995 Monitoring Report continue to have use problems. Monitoring of these areas is by observation and inspection which provides relative use trends. Problem areas on the Wind River District are Brooks Lake, the Wiggins Fork Road/Double Cabin area, and the Union Pass area.

On the Washakie District, Louis Lake Basin is in need of dispersed recreation management.

5. Developed Site Use

Developed recreation site use is monitored largely through user fees and observation. More reliable use data is available for sites where fees are collected. Where user fees are not collected, District recreation personnel keep track of use in a number of ways including car counts at trailheads, visual estimates, and sign in sheets. In 1996 the Forest experienced approximately 1,521,500 RVDs, up slightly from the 1,321,300 in 1995. The following is a breakdown by activity of developed site use.

Table 3. Developed Site Use by Activity in Thousand RVDs

Activity	FY1994	FY1995	FY1996
Camping and Picnicking	327	321	362
Winter Sports	17	19	25
Resorts, Cabins, and Camps	133	137	154
Other Recreation Activities	74	75	78

Evaluation

The Forest Service nationwide is adopting a new system for collecting uniform and consistent data on recreational sites and areas. The new system is referred to as Meaningful Measures. The goals of this effort are to identify measurable components; establish standards of quality; determine realistic costs; prioritize work to be accomplished; allocate the program of work and agree on management attainment targets; and monitor, measure, and report actual management attainment. This system is the result of a Government Accounting Office (GAO) report on recreation resources which acknowledged in its findings that the Forest Service does not have uniform and consistent data on recreational sites or areas. It found that reliable data on maintenance and reconstruction needs is also lacking. There is an effort underway across the Forest Service to address this situation.

In 1995 baseline data was collected and verified during the field season. Forest personnel participated in several Region wide "leveling" meetings. Region wide standards for maintaining recreation facilities were developed and prioritized. Implementation of the Meaningful Measures system should begin in 1998. This process is expected to help the Forest better define the quality of use it provides in addition to just the amount. Measures used to monitor will be consistent throughout the National Forest system.

6. Developed Site Condition

Operation and maintenance of developed sites is part of the Forest's annual program of work. Facilities are maintained to the extent that funding levels allow. In recent years the level of funding has made it very difficult to keep up with both operation and maintenance of developed sites and future funding is not expected to increase. In 1995 in an effort to address the problem, a decision was made to look for other

ways to run some of our developed campgrounds. Volunteers, concessionaires and partnerships are some of the options that were considered. Volunteer camp hosts and interpreters have been utilized throughout the Forest and provide a tremendous service. In August of 1995 the Shoshone issued a prospectus to potential campground concessionaires. In March of 1996 a permit was awarded to Rocky Mountain Recreation to operate many of the developed recreation facilities on the Clarks Fork, the Wapiti, and the Wind River Districts.

Evaluation

Implementation of Meaningful Measures, the new Forest Service system mentioned under the previous monitoring element, will help the Forest establish clearer standards for measuring the condition of facilities at developed recreation sites. An inventory of developed sites was recently conducted on the Forest and that information is being loaded into a database during the winter of 1996/97. Information on developed site condition will be easier to manage once the database is complete.

On the Clarks Fork District 8 campgrounds (110 campsites) were managed by the Rocky Mountain Recreation Company. Management operations and facilities were inspected 3 times per week. Four formal inspections of concessionaire operations were also performed. Complete facilities inspections were made at the end of the operating season.

Campground facilities on the Clarks Fork are nearly all of uniform age. Picnic tables, fire rings, and toilets are in need of replacement. Very few of the District's facilities are accessible to disabled persons. In 1996 the District installed two new accessible toilets; one at Top of the World Store and the other at Hunter Peak Campground. Many facilities were stained or painted in 1996. With limited budgets maintenance levels at developed recreation sites are generally routine and the heavy maintenance backlog is extremely high.

Developed sites on the Wapiti District receive heavy use from June through mid September. Campgrounds on the North Fork Corridor were operated by Rocky Mountain Recreation Company during the 1996 season. Monitoring of site condition occurred almost daily and was recorded in daily logs and on site inspection forms.

Daily journals indicate that in general campground facilities are clean and well maintained. The primary problem noted by Forest personnel is the degradation of these facilities through daily wear and tear. Most of the picnic tables, hand pumps, fire rings and toilets have been in place since the 1960's and need to be replaced. Despite the heavy use these sites receive soil and vegetation condition is generally good.

Two leaking toilets were identified in Wapiti Campground. These toilets will be replaced in 1997. Since most toilets on the North Fork corridor have been in place for many years vaults will be monitored closely throughout the 1997 season.

Deer Creek campground has experienced an increase in visitor use over the last two years. Currently no fee is charged at this camping facility. Although facilities at this campground are in need of replacement, soil and vegetation condition is good.

Concessionaire offset fees are expected to help the Forest fund facilities replacement in developed areas. In 1996 offset fees were used to replace 8 bulletin boards and a water pressure tank for Wapiti campground. Future projects include replacing hand pumps and fire grates in campgrounds.

The campground facilities on the southern half of the Forest are in poorer condition than those on the northern half. Heavy maintenance work has not been completed in a number of locations because of personnel, time and funding limits. As a result, facilities are beginning to show signs of deterioration. The Louis Lake campground (see Dispersed Recreation discussion), for example, is receiving heavy use and subsequent resource impacts to the campsites and surrounding area. Major rehabilitation and/or reconstruction is needed. The water system in the Sinks Canyon campground requires constant maintenance. In 1995, six breakdowns occurred. Additional Capital Investment funds are needed to upgrade these facilities.

7. Downhill Skiing Use

The Shoshone's single developed downhill ski area, Sleeping Giant, is located on the Wapiti District. The area can accommodate approximately 2,000 skiers at one time (SAOT). In fiscal year 1995 (1994/1995 season) Sleeping Giant received 1,124 skier visits in the month of December, 1,178 in January and 1,036 in February. Skier visits for the 1996/1997 use season have, so far, been consistent with 1995/1996 use levels.

Evaluation

The Forest Plan recommends re-evaluation of the ski area development schedule when use exceeds managed capacity for three years. Sleeping Giant did not operate during the 1991/1992, 1992/1993 and 1993/1994 winter seasons. Use figures for 1994 through 1996 indicate that Sleeping Giant has not come close to reaching capacity.

WILDERNESS

1. Wilderness Use

The Shoshone National Forest contains all or part of 5 wilderness areas totalling 1,379,048 acres or 56.7% of the total Forest acreage. They are the North Absaroka, Absaroka-Beartooth, Washakie, Fitzpatrick and Popo Agie. Every ranger district on the Forest contains areas of wilderness. Though the Forest Plan recommended RIM as the technique for monitoring wilderness use, it has not been used for a number of years. The Forest Plan is in the process of being amended to reflect newer monitoring techniques including that for wilderness use. Wilderness Implementation Schedules (WIS) have been completed for all wilderness areas on the Forest although funding has not been available to implement them completely. A WIS in its most simple form is a listing of activities, practices and projects that go into wilderness management.

In 1995 the Shoshone experienced an estimated 189,000 recreation visitor days (RVD) in wilderness. In 1996 that number was slightly over 225,000 RVD. These are approximate numbers and do not provide as much information as the types of use, seasons of use and where use is concentrated. Wilderness use varies between the north and south halves of the Forest and between the wilderness areas themselves.

2. Wilderness Campsite Condition

Wilderness campsite condition is closely tied to wilderness use. The Forest Plan recommended Frissell inspection as the technique to monitor wilderness campsite use. However, application of this method has been un-workable in wilderness areas and the modified Cole methodology is preferred. As mentioned above, the Forest Plan is currently in the process of being amended to reflect newer monitoring techniques.

Campsites in wilderness areas that receive heavy use are the most impacted ones. For example, campsites in the Popo Agie wilderness were almost all surveyed by NOLS volunteers in the late 1980s. They found some of the same problems which occur in heavily used dispersed recreation campsites. Many campsites were exceeding Forest Plan standards and guidelines. This is part of what drove the use allocation process and subsequent permitting system.

Campsites in other wilderness areas on the Forest are not systematically monitored due to budget constraints although ranger district personnel are aware of where the majority of the problems are. On the north end of the Forest the largest impacts occur during hunting season when use is concentrated. On the south end use is relatively steady year long. It is certain that a number of campsites are in poor condition. Wilderness Implementation Schedules address many of these problems but unless funding improves they will not be fully implemented.

Evaluation

Wilderness crews and trail crews monitored wilderness campsite condition through visual observation during the summer of 1996.

Campsites on the north zone of the Forest were inventoried by a 2 person Wilderness crew. 18 campsites were inventoried in the North Fork of the Shoshone drainage, North Crandall Creek and in the Sunlight drainage.

North Fork campsites receive the highest use and are in the poorest condition. Damage to soil and vegetation is high in a majority of the sites. North Crandall and Sunlight have a wider range of conditions; from good to poor.

Although the resources in all sites received some impact, little trash or litter was found. It may be assumed that this is in response to the Grizzly Bear Food Storage Order and intensive public education efforts.

With only a two person Wilderness crew, completing Wilderness campsite inventories will be a slow process. Rehabilitating campsites which are in poor condition is cost prohibitive under current Wilderness budget allocations.

As mentioned in the 1995 Monitoring and Evaluation Report a permitting system for the Forest wilderness areas is being considered. This system would redistribute use and allow impacted areas recovery time.

VISUALS

Adopted Visual Quality Objective (VQO)

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

VQO are monitored on a project level and attained through project implementation. Projects are monitored for VQO compliance on the Shoshone Forest through the NEPA (environmental analysis) process. If project level analysis shows that an existing VQO, as identified in the Forest Plan, is not going to be met by the proposed action, mitigation measures must be planned for and implemented to meet the VQO in a minimum amount of time. Timeframes for meeting VQO vary between individual visual quality objectives.

In 1996 the program of work for managing visual quality objectives mainly involved the monitoring of road construction and timber sales.

Evaluation

ROAD CONSTRUCTION

Visual quality objectives were managed for retention and partial retention throughout the reconstruction of the Buffalo Bill Cody Scenic Byway and adjacent lands. To accomplish these objectives, roadway slope treatments included: blending soil and colluvial cut faces into surrounding landscapes; creating natural appearing rock cuts to match surrounding landform; leaving vegetation untouched where ever possible; and placing new recreation facilities subordinately within the landscape. These treatments were successful in meeting the VQO. Only the gravel pit does not blend subordinately into the landscape, however measures were taken to place the equipment/ machinery out of the viewshed. The gravel bar is a short term visual aberration; mitigation for the entire staging area is planned, immediately following the completion of the entire byway reconstruction.

TIMBER SALES

Photographic monitoring points were established in the summer of 1996 for the proposed Ellsbury Timber Sale on the Clarks Fork District. These photographs will serve as baseline data for monitoring the visual affects of the proposed sale activities.

Photographs were also taken of many of the viewsheds which were burned in the Clover Mist Fire of 1988. 1996 was the second year of this documentation. No change in visual quality was noted in these areas. It is expected that the real monitoring benefits of these photographs will be shown in the long term.

CULTURAL RESOURCES

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

As required, all National Register sites were monitored for condition and discernible impacts from any activity. No major affects were noted although normal decay appeared to be a serious problem on some historic structures. Problems were discussed with owners of private facilities and substantial repair has been conducted on Forest Service facilities. Careless recreational use continues to be a major impact on prehistoric sites with surface components. Possible remedies including increased agency presence, public stewardship, and remote sensing are being explored. One goal, to relocate and validate sites recorded in the 1970's, has been somewhat successful. Several sites have proven to be grossly exaggerated as to importance and content; others have proven inaccurately located.

In addition, survey and monitoring was conducted as part of the agreement on rangeland management activities (Agreement #1102-0002-95-037) and in accordance with the National Environmental Policy Act, documentation was prepared for 36 of 82 range allotments on the Shoshone National Forest. These allotments are identified in Table I-1 and locations are keyed to figures I-A and I-B in the Range Permit EA. The following describes heritage resource monitoring activities in connection with range permit issuance.

Beginning in 1995, file searches were requested at a county level. These provided more than adequate information, including location (with 1/4 sections), site type, eligibility, recording agency, and so forth. County wide file searches for Park, Fremont, Hot Springs, and Sublette Counties were requested from the Wyoming State Historic Preservation Office Cultural Records Office were used in conjunction with forest cultural resources files to determine locations of sites in allotments.

Field survey was conducted on 11 allotments during the 1996 field season by an Heritage Resource Program specialists. Acreage figures are documented in Table 4 below. Several new sites have been recorded as a result of this work, some of which are quite intriguing and scheduled for additional work.

For the 1996 field season, survey locations were based largely on the model using degree of slope, distance from permanent water source, aspect, and vegetation cover as criteria.

Allotments with expiring permits were the primary focus except where weather and other circumstances prevented such work. Field examination was then shifted to other allotments as accessible. An attempt is being made to utilize every opportunity in connection with any project to expand coverage and understanding of site distribution in range allotments and other areas.

Table 4. Range Allotments Surveyed for Heritage Sites

Allotment Name	Acres surveyed	Sites
North Zone		
Basin (002)	500	14
Bobcat (134)	1200	0
Community (135)	2000	2
Face of the Mtn (005)	3000	19
Hunter Creek (044)	1000	1
Ishawooa Hills (145)	1000	0
Wood River (500)	500	1
North Zone Total	**9200**	
South Zone		
Bear Creek (192)	100	3
Dickinson Park (092)	500	4
Wiggins Fork (190)	500	18
Doby Cliff (101)	500	0
South Zone Total	**1600**	
Additional Survey Areas		
Bald Ridge (001)	300	11
Bench (003)	100	3
Horse Creek (183)	150	12
South Pass (109)	100	4
Slate Creek (109)	50	3
Forest Total	**11500**	

Evaluation (specific to grazing agreement)

National Register sites are being monitored and evidence no damages associated with grazing. This may be due to most being fenced (in the case of historic structures) or buried at such depth to prevent damage (in the case of prehistoric sites).

On the sites monitored, there is no damage that could be attributed to grazing impacts on the sites. Allotments surveyed to a point where it is judged that impacts are unlikely to be a result of grazing activities are indicated on the allotment schedule. This is based on an assessment of sites found in areas where livestock are frequently gathered, number of acres examined in high site/high impact probability areas, and general trends of vegetation and soil stability in areas with sites or high probability.

As noted, in conjunction with the agreement regarding Section 106 compliance and grazing permit issuance, the Forest has been identifying areas of major impact possibility and areas of high site probability. Heritage Resources program personnel and range conservation specialists have coordinated field work to maximize results. Existing information and field data obtained during the summer of 1995 was utilized. Field personnel made every effort to focus field survey where potential major impact areas overlap high site probability.

The predictive model was more extensively utilized in the 1996 field season and is proving to be moderately accurate. There still appear to be elements that are not understood, however, as some areas judged to be of high probability based on the model have failed to produce any prehistoric cultural material. It may be that sites are present but at sufficient depth to preclude surface indications. Limited testing would be the ideal solution but hard to implement given workload, personnel availibility, and priorities set by line officers in regard to the range permitting process.

THREATENED AND ENDANGERED SPECIES

1. Grizzly Bear Mortalities

The Shoshone National Forest lies within the Greater Yellowstone Area (GYA) which is home to one of the larger populations of the threatened grizzly bear in the lower 48 states. The Endangered Species Act requires special protection and management on Federal lands. The Forest Service is committed to help achieve the bear's recovery and works actively with other agencies towards this goal through implementation of the Interagency Grizzly Bear Guidelines.

This monitoring item was included in the Shoshone Forest Plan but is also a goal for the entire GYA. An important aspect of the grizzly bear's recovery program is the prevention of mortalities whenever possible. The Forest Plan identified a limit for preventable grizzly bear mortalities of 6 bears for the GYA to be monitored on an annual basis. However, since the Forest Plan was implemented (1986), revised monitoring criteria have been adopted by the U.S. Fish and Wildlife Service on the recommendation of the Yellowstone Ecosystem Grizzly Bear Management Subcommittee (YES) of the Interagency Grizzly Bear Committee (IGBC). Shoshone National Forest officials, as members of YES, have played an active role in formulating the revised monitoring criteria.

The 1993 Recovery Plan established a number of parameters to be monitored for determining recovery within the GYA. Criteria for recovery include a limit on grizzly bear mortalities that applies to all jurisdictions within the GYA. Known human-caused mortality is not to exceed 4 percent of the minimum population estimate calculated on a 6-year running average. In addition, female mortality (6-year running average) is not to exceed 30 percent of the 4 percent. Methods for estimating populations and calculating mortality limits are documented in the recovery plan. Because all recovery information reported by IGBC is summarized by calendar year, mortality information will similarly be presented and discussed.

Evaluation

In 1996 total mortality in the GYA from known human causes was 9 bears. Four of them were females (three adult females). Females of reproductive age are noted because they are particularly important to recovery. Only one mortality occurred on the Shoshone National Forest. A subadult male grizzly was mistaken for a black bear and killed by a hunter. The 6-year running average (1991-1996) mortality limit for the GYA is 8.8 for all bears and 2.6 for female bears. The actual know human-caused mortality for the 1991-1996 period is 7.1 for all bears and 2.8 for females. Total known human-caused mortality 6-year average for 1996 is below the limit but known female mortality slightly exceeds the limit. Both total and female mortality limits were exceeded in 1995 and marked the first time since the development of this monitoring criteria that the mortality limit had been exceeded (Table 5).

Grizzly Bear mortalities had been on a downward trend during the first seven years of the last decade. However, beginning in 1994 mortalities have increased. Both 1994 and 1995 were poor food years for the bear and resulted in an increase in the number of human/bear conflicts and subsequent habituation, management removal and mortality of bears. Five of the nine mortalities in the GYA in 1996 (management removals) were bears with a previous history of conflicts with humans or livestock, possibly precipitated during previous poor food years. One of the 1996 mortalities was a bear killed by a vehicle on a highway and the other three were hunter related, including the single mortality on the Shoshone National Forest.

Throughout the GYA, hunter related bear mortalities are an issue. Much time, effort and money is spent on hunter information/education, bear mortality prevention patrols, and enforcement of food storage orders to minimize human/bear encounters during the hunting season. Efforts were increased on the Shoshone in 1996 to educate hunters and outfitters. Three hunter related mortalities occurred on the Shoshone in 1995. The Forest will continue to be diligent in this effort and look for new or more effective ways to educate hunters.

In spite of relatively high levels of mortality in the GYA during the last 3 years, the population appears to be expanding and moving towards recovery. The Forest does not believe that higher levels of mortality are due to a lack of effort on the Forest or in other areas of the GYA. Rather a combination of poor food years and increased numbers of bears are likely the reasons for higher levels of mortality in recent years. Mortalities will likely continue to be high due to increasing grizzly bear population. However, the goal will still be to have mortality levels at or below the limit set in the recovery plan unless it is determined after careful review and consideration that the population can sustain a higher mortality level and still achieve other recovery criteria. The IGBC is currently reviewing the methodology used to estimate minimum population numbers on which mortality limits are based. Newly published methodology for reducing the yearly fluctuation and increasing the reliability of these estimates may be used.

Grizzly bears are showing up in areas of the Forest where they have not been documented for decades. The Forest is taking steps to preclude human/bear conflicts and grizzly mortalities in newly occupied or potential habitats by expanding efforts to educate users regarding proper storage of food and carcasses and to install bear resistant facilities.

Table 5. Known Human Caused Grizzly Bear Mortalities in the Greater Yellowstone Area and on the Shoshone National Forest (SNF) 1987-1996.

Year	Annual Total Mort (SNF)	Total Female Mort (SNF)	Total Mort Limit	Total Mort 6-Yr Avg	Female Mort Limit	Female Mort 6-Yr Average
1987	3 (0)	2 (0)				
1988	5 (1)	3 (0)				
1989	1 (0)	0 (0)				
1990	9 (3)	6 (2)				
1991	0 (0)	0 (0)				
1992	4 (2)	1 (0)	9.4	3.7	2.8	2.0
1993	3 (2)	2 (1)	9.2	3.7	2.8	2.0
1994	10 (2)	3 (0)	8.2	4.5	2.5	2.0
1995	17 (5)**	7 (3)**	6.9	7.1*	2.1	3.2*
1996	9 (1)	4 (0)	8.8	7.1	2.6	2.8*

* 6-Yr average exceeded mortality limit

** 1 female captured and removed from ecosystem in Montana. Mortality attributed to Shoshone National Forest where the original management action (capture and relocation) occurred. Mortalities are not tracked to original management action prior to 1995.

2. Compliance with Grizzly Guidelines

Compliance with Grizzly Guidelines is incorporated into the Shoshone National Forest's annual program of work. All activities authorized, funded, or carried out are reviewed to determine the effect they may have on grizzlies and their habitat. This includes an examination of potential cumulative effects as well as individual project effects. Projects are reviewed for compliance with the guidelines through the preparation of a biological evaluation. Mitigation measures are incorporated where necessary. When it is determined through this biological evaluation process that activities may affect grizzlies or their habitat, consultation with the U.S. Fish and Wildlife Service occurs. This includes both informal and formal (when appropriate) consultation to ensure compliance with the guidelines.

Evaluation

Twenty biological evaluations were written on projects potentially affecting grizzly bears in FY96. The only formal consultation conducted in FY96 was on the recreation enhancements in the North Fork Corridor. This consultation resulted in several terms and conditions designed to maintain or improve habitat for the grizzly bear in the corridor. Most of the terms and conditions were directed at minimization of grizzly bear/human conflicts. All terms and conditions will be implemented in FY 97. Major informal consultations in FY 96 included requests for concurrence on several timber sales and a range allotment environmental assessment on 36 livestock allotments. Fish and Wildlife Service recommendations were incorporated.

The Forest and the U.S. Fish and Wildlife Service agreed in FY 96 to work together even more effectively to promote recovery of the bear. Forest and District biologists will meet quarterly with U.S. Fish and Wildlife Service biologists to review all proposed projects and set priorities for consultation. The first of such meetings was held on September 25, 1996. In addition, more effort will be put into cooperative on the ground review of projects and collaboratively written evaluations.

Coordination was also conducted with other knowledgeable parties, including biologists with the Wyoming Game & Fish Department. Grizzly bear clauses, as identified in the Guidelines, were included and updated where appropriate in all special use permits, grazing permits, contracts, etc. issued for activities in grizzly habitat on the Forest.

Efforts to minimize grizzly-human conflicts are an integral part of the ongoing Forest program of work and are given the highest priority. Public education is paramount to the continued success in grizzly bear recovery. The Forest disseminated considerable information concerning areas of high seasonal bear activity, identification, behavior, foods, and measures to prevent or minimize grizzly/human conflicts. Information was made available at Forest offices, trailheads and campgrounds, the Wapiti Information Center, Clay Butte Information Center, included in mailings to potential visitors and hunters and distributed by Forest Personnel through personal contacts with Forest users.

Campgrounds on the Clarks Fork, Wind River and Wapiti Districts were managed through a concessionaire in FY 96. The operating plan included measures requiring the concessionaire to inform users of proper behavior in bear country. The concessionaire developed a newsletter that was distributed to all campers which informed them of bear necessities. They conducted a bear information and safety program, as part of their free nature programs, at least once every two weeks at various campgrounds on the Clarks Fork District. Several bear programs were also sponsored by the concessionaire on the Wapiti and Wind River Districts (See discussion under North Fork Corridor below).

Classroom presentations were given at local schools on various aspects of the National Forest including information on the habits of the grizzly and how to behave when visiting grizzly country. The Forest Service and the Wyoming Game and Fish Department conducted public workshops in Cody, Powell and Riverton in 1996 to educate forest users on the proper behavior in bear country. Additional workshops are scheduled in 1997 and beyond. A Forest employee taught the bear education portion of the Hunter Safety Program in the fall of 1995 and 1996 and the spring of 1996 in Dubois, Wyoming. A press release in the spring reminding people about proper behavior in bear country was carried on the front page of the Cody Enterprise. The release was also sent to Powell, Meeteetse, and local radio stations.

A special order requiring that all human foods and other attractants be kept unavailable to bears was strictly enforced. The order has been implemented in most areas of the Forest that receive consistent use by grizzly bears. Bears are expanding their range on the Forest. A large portion of the Greybull District and additional portions of the Wapiti District were included in the Food Storage area in 1995. Efforts began in 1996 to educate users regarding the need for food storage in additional areas south and east of the current food storage boundary, again in response to increased documented use by grizzlies. Education and providing bear resistant facilities (Dumpsters and meat poles) will precede any further application of the Food Storage Order in these areas. Social acceptance of expanding bear populations is paramount to the success of further recovery. Increased regulations are not considered the best initial approach. If satisfactory success is not achieved application of the Food Storage Order will be considered.

Throughout the field season, compliance officers monitored campgrounds and lodges on a regular basis to assure that visitors were complying with food storage and other bear-related regulations. In the fall, Forest employees participated in hunter patrols in both the front and backcountry. Hunters received information packets which included bear literature. Camps and trailheads were inspected for bear attractants and food storage compliance. Hunter patrols were a high priority on the Forest. Permanent employees were often reassigned to this task at the expense of other ongoing or previously planned work. In 1996 fourty-three violation notices and many more warnings were issued for non compliance with the food storage order throughout the Forest.

Signs are posted at major travel corridors alerting travelers that they are entering grizzly country. Warning signs are also utilized where temporary situations exist such as livestock or wildlife carcasses, gut piles, unusual bear activity, etc. All posters and signs were inspected and replaced as necessary. In 1995 the Forest developed a new more permanent sign design for installation in appropriate areas around the Forest. Numbers and general locations of the new signs installed in FY 96 are listed below. More signs will be installed in FY 97.

7 - Entrances to campgrounds and dispersed camping sites on the Clarks Fork District.

1 - Entrance into Food Storage area along the Chief Joseph Highway on the Clarks Fork District

3- Wind River District replacing signs that were stolen.

1 - Cody-Yellowstone Highway at the West entrance to the Food Storage area on the Wapiti District.

5 - All roads entering the food storage area on the Greybull District.

7 - New bulletin boards were installed to display bear information on the Clarks Fork District at highway pullouts on the Beartooth Highway, dispersed camping sites and Forest roads.

Food storage compliance was facilitated through widespread availability of bear resistant dumpsters, boxes and bear poles for storing food at both developed and dispersed campsites as well as numerous backcountry locations. All dumpsters and bear boxes on the Forest were inspected for effectiveness. Approximately 12 hinges were replaced on defective boxes in back country locations on the Forest. Twelve new bear poles were installed on the Greybull district and one on the Wind River District.

Bear resistant panniers and backpacker tubes were available at the Clarks Fork and Wind River Ranger District offices for use by the public when traveling in bear country.

The Forest worked closely with the Wyoming Game and Fish Department to document all grizzly bear/human and grizzly bear/livestock conflicts and to eliminate the cause. The location, cause and result of all conflicts were documented and summarized in a GYA-wide report coordinated by Yellowstone National Park. This report, which includes recommendations for resolution, was reviewed at the spring meeting of the Yellowstone Ecosystem Grizzly Bear Manager's Subcommittee (YES). Only eight bear/human conflicts were documented on the Shoshone National Forest in 1996. Only one conflict resulted in the bear receiving a food reward. Two resulted in minor property damage (scratched camper and damaged snow machine seat), four involved depredations on cattle and one was hunter related (Grizzly killed when mistaken for a black bear).

North Fork Corridor

The North Fork corridor is one of the most heavily used areas of the Forest by both grizzlies and people. The Cody-Yellowstone highway provides access to Yellowstone Park for millions of visitors annually. Most of the Forest's permitted lodges are located along this corridor as well as the bulk of the developed campgrounds. Most of the front-country bear-human conflicts on the Forest have historically occurred in this corridor. As such the Forest gives special emphasis to minimizing conflicts in this area. The following identifies more specifics and additional efforts to minimize grizzly-human conflicts in this important area in FY 96.

Beginning June 10, 1996 the Forest sponsored interpretive programs at six of the lodges in the North Fork Corridor. Three interpreters made at least 8 presentations weekly at these lodges thru August 31 that always included information on proper behavior in grizzly bear country. Several programs were also conducted at campgrounds in the corridor. A total of about 800 people attended these programs thru the summer of 1996. This is the fourth year of the program which has received accolades from the lodges that participate and the guests for whom the talks are designed. Every effort will be made in 1997 to have all lodges involved.

The Wapiti Valley Information Center provided verbal bear information, a bear video and distributed an average of 400 pamphlets/day on proper behavior in bear country to over 13,000 registered visitors in 1996 (only about 1/3 of the visitors sign the register). In 1996 an additional volunteer was added to talk with those who stop to see the outside exhibits and/or use the restrooms but do not come inside the center. The Clay Butte Lookout Information Center on the Clarks Fork District had about 7,000 registered visitors in 1996 each receiving verbal bear information with thousands of bear pamphlets distributed.

The Forest made it mandatory that all personnel working in the Corridor associated with highway construction participate in a training session on proper behavior in bear country. The Wyoming Highway department assisted the Forest Service in the development of a video. The video was shown at least 30 times reaching approximately 180 employees. Copies were made and distributed to all five ranger districts on the Forest. Additional presentations were made to the campground

concessionaire employees and hosts, seasonal lodge employees, Buffalo Dam Visitor Center employees, and the boy scout camp.

Campground concessionaire hosts talked with all campground users and handed out nearly 7,000 "Bear Us in Mind" brochures. The concessionaire also produced a newsletter for June 1996 that highlighted grizzly bear information. All signs at campground entrances, bulletin boards, and in bathrooms were kept updated and replaced if needed. A customer service officer hired by the concessionaires visited on a nightly basis (6:00 P.M. until 2:30 A.M.) every campground and site to educate, inform, and if need be confiscate unattended food, beverages, and garbage. Forest Service officials were contacted if a violation notice needed to be issued and advised of any bear activity. Mark Bruscino (WGFD) reviewed the concessionaire operating plan and proposed newsletter and provided some suggestions which were incorporated.

Forest Service officers were on regular patrol to check for compliance with grizzly bear special orders and to educate and inform users about camping, hiking, hunting, fishing, etc. in grizzly country. Between May 15 and October 1 (not to include hunter patrol) the following were issued: approximately 250 courtesy messages thanking those who were utilizing safe methods in grizzly bear country (mainly at trailheads); 30 violation notices issued for non compliance with grizzly bear special orders; 73 warning notices given for minor infractions of orders such as a pop/beer can left in bed of truck or at camp site. All campgrounds and trailheads in the corridor were monitored daily.

During hunter patrol (September 30 - November 17) there were 23 Forest Service employees involved in informing, educating, and compliance. Front country statistics for this period of time are as follows: 1048 vehicles logged; 1019 flyers placed with vehicles or at camps thanking user for compliance, five violation notices issued, 32 warning notices issued. Approximate back country statistics are: 50-60 camps checked, 30-40 thank you flyers placed, 10-12 violation notices given, 8-10 warnings given.

Tributary roads and other pullouts or river access ways in the Corridor were monitored at about the same frequency as campgrounds and trailheads. The non-system roads up Clocktower Creek and Blackwater were gated and signed closed in 1996 partly to eliminate the potential for Food Storage violations by dispersed campers. Overnight stays or camping within one half mile of the North Fork Highway, other than at developed campgrounds and certain trailheads, is prohibited.

Letters were sent to each summer home owner in the spring reminding them of the need to comply with the grizzly bear/food storage special order. Recreation residence owners are required to submit a self-inspection form annually that indirectly addresses requirements relating to bears. An intensive on site inspection of summer homes was conducted in 1996 which included taking photographs and identification of potential problems. In addition, every summer home on the Wapiti District was inspected at least one other time for compliance with the grizzly bear special order. There was not a single violation noted - thank you flyers expressing gratitude for compliance were left at each home. Random cursory inspections of summer homes occurred often as compliance officers or other employees drove by.

As in previous years, letters were sent to each lodge owner in the spring reminding them of the need to comply with the food storage special order. Lodge operating plans were reviewed by Forest Service personnel and by Mark Bruscino from the Wyoming Game and Fish Department. Suggested improvements were incorporated into several plans in 1996, with the remainder to be updated this winter. At the beginning of the season (May 25-30) all guest lodges were given a courtesy inspection to point out areas that could be improved to discourage bear curiosity and incidents as well as possible violations of the special orders.

Lodges were visited at least weekly throughout the summer and almost always were in compliance with the special order. One lodge (new owners 1996) was found to be in non-compliance with the food storage order several times during the summer. The lodge owners were warned initially for minor infractions but issued a citation in late summer for leaving trash out at employee quarters. The lodge is on probation for the 1997 operating season partially due to attractant storage non-compliance. In early July unannounced full inspections were held with all lodges found to be in compliance with the exception of a guest leaving a cooler outside the cabin - a violation notice was given.

Violation of food storage regulations have decreased in the campgrounds over previous years. Only 2 incidents were reported. One where a bear received a food reward and partially destroyed a tent after cheese from pressurized cans was squirted on the ground and on a tent at the Boy Scout Camp. The responsible boy was issued a $75 violation notice. The other incident was in Eagle Creek Campground where a bear walked around and clawed at an occupied camper. There was no food reward or property damage.

The Forest is complying with the Guidelines and will continue to do so. We believe cooperative efforts towards managing grizzly bears and their habitat are making positive contributions to the recovery goals. Numbers of grizzly-human conflicts were significantly lower than the two previous years partly due to increased education and food storage compliance efforts.

3. Grizzly Habitat Effectiveness

Originally this monitoring item required the Shoshone National Forest to monitor grizzly bear habitat effectiveness and to correct deficiencies in compliance prior to the second decade after the Forest Plan was published (1986). The Grizzly Bear Cumulative Effects Model (CEM) was identified as the tool for measuring grizzly habitat effectiveness in the original Forest Plan. Forest Plan amendment 91-002 (1991) changed the data sources and techniques for monitoring this item from the CEM to the following:

- Interagency Grizzly Bear Guidelines
- Grizzly Bear Recovery Plan
- Yellowstone Subcommittee Reporting System Task Force
- Consultation Procedures
- Biological Evaluations

The amendment also changed the allowable variability for compliance with deficiencies identified through monitoring from the second decade after release of the Forest Plan (1986) to "as soon as practical."

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 Forest grizzly bear habitat. The latter is often done in conjunction with the annual deliberations of the Yellowstone Ecosystem Grizzly Bear Management Subcommittee. Data from various monitoring efforts, as well as professional judgements are used to assess overall habitat effectiveness for the entire Forest and for specific projects.

Previous sections in this report have identified Forest efforts in FY 96 as it relates to several of the above identified data sources and techniques (Interagency Grizzly Bear Guidelines, consultation procedures and biological evaluations). See section on Compliance with Grizzly Guidelines in this report.

The Yellowstone Subcommittee Reporting System Task Force as a definitive group has been dissolved in recent years. The Forest does take an active role in reporting grizzly bear observations, mortalities and conflicts to the Interagency Grizzly Bear Study Team and the Wyoming Department of Fish and Game. Grizzly bear/human conflicts for FY 96 are discussed elsewhere in this report (See section on Compliance with Grizzly Guidelines).

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

1. Fifteen females with cubs over a running 6-year average both inside and outside the recovery zone and within a 10 mile area immediately surrounding the recovery zone.

2. Sixteen of 18 bear management units (BMUs) occupied by females with young from a running 6-year sum of observations. No two adjacent BMUs will be unoccupied.

3. Known human caused mortality not to exceed 4 percent of the minimum population estimate based on the most recent 3-year sum of females with cubs. Furthermore, no more that 30 percent of the 4 percent mortality limit shall be females.

In 1996, there were 33 females with cubs of the year (highest number recorded in the GYA since 1974) and all 18 BMUs were occupied by females with young. The 6-year average for females with cubs of the year was 22.8 and 18 of 18 BMUs occupied. All recovery objectives are being met with the exception of female mortality. See section on Grizzly Bear Mortalities in this report for 1996 mortality data.

These parameters are also recorded by BMU. BMUs were delineated in order to divide the recovery area into smaller units defined by biologically meaningful features that have known significance to bears. There are 18 BMUs in the recovery area, three of which are entirely on the Shoshone National Forest (Crandall/ Sunlight, Shoshone and South Absaroka). The only other BMU on the Forest is the Lamar, most of which is in Yellowstone Park and a small portion on the Gallatin National Forest.

Evaluation

Five unduplicated females with cubs of the year (COY) were documented in the Shoshone BMU and three in the South Absaroka BMU in 1996, accounting for about 1/4 of the Females with COY in the GYA. All BMUs on the Forest were occupied by females with cubs and the only mortality on the Forest in 1996 occurred outside the recovery area. Grizzly bear/human conflicts were much lower in 1996 than in the two previous years.

The Forest has done an adequate job of assessing the impact of projects on habitat effectiveness at the site specific level, as well as on the Forest as a whole, given the assessment tools readily available. Biological evaluations, adherence to the Interagency Grizzly Bear Guidelines, consultation with the U.S. Fish and Wildlife Service and various reporting and monitoring efforts appear to have been successful in maintaining habitat effectiveness for grizzly bears on the Forest.

A positive step towards maintaining grizzly bear habitat effectiveness was the policy adopted by the Forest in 1994 of "no net increase in roads." Roads were identified as significant factors in cumulative

impacts to bears and other resource values. The Forest constructed 1 mile of new road, reconstructed 4.5 miles of road, closed 3 miles and obliterated 9 miles. All activity was outside the recovery zone but within areas potentially used by bears. Roads, or rather the human access associated with roads, are known to reduce habitat effectiveness for grizzly bears. Road closures and obliterations in FY 96 undoubtedly increased habitat effectiveness for bears on the Forest.

The Forest is contributing to the overall goal of grizzly bear recovery. Grizzly bear habitat on the Forest appears to be stable to increasing. Expansion of bears into new areas and apparent increases in population size and reproduction (females with cubs) on the Forest all point in the direction of positive habitat effectiveness. Continued progress in achievement of population recovery objectives will serve as a barometer for overall habitat effectiveness.

Current techniques identified in the Forest Plan are less than ideal for quantitatively monitoring habitat effectiveness for grizzly bears. Although they provided the only available tools at the time, pending developments through the Interagency Grizzly Bear Committee including, the draft conservation strategy, road density and core area analysis, and the Grizzly Bear Cumulative Effects Model (CEM) will provide a better basis for long term monitoring. Use of these tools in establishment of a baseline for future monitoring is discussed in the Trend Analyses section of this report.

3. Wolf Population Status

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

Seventeen additional wolves from Canada were reintroduced to Yellowstone National Park in the latter part of January 1996. Ten pups from two different packs in Montana were captured and transferred into holding pens (August 29 and September 8, 1996) in Yellowstone National Park after adults from the packs had been involved in livestock depredations. As of September 30, 1996 there were 32-33 free ranging wolves in the Yellowstone area and 20 in captivity in the Park.

Identified wolf packs are Rose Creek, Crystal Creek, Soda Butte, Leopold, Nez Perce Family (No adult male), Chief Joseph, Druid Peak, Lone Star Male/Nez Perce Female and Male #15/Female #26. There are also several lone wolves.

Wolves are monitored as closely as circumstances will permit by the U.S. Fish and Wildlife Service. The Forest maintains contact with representatives of the U.S. Fish & Wildlife Service and the National Park Service regarding the status and location of the reintroduced wolves. Weekly written reports from the Wolf Recovery Coordinator are received by the Forest Service. Observations of wolves or tracks are recorded as received by Forest Service personnel and Forest users (Table 6).

Table 6. Gray Wolf observations reported to the Shoshone National Forest in FY 96.

DATE	LOCATION	WHO	TYPE OF SIGHTING
10/15/95	Upper Pilot Creek	Public	Tracks 4-5 wolves
2/1/96	Near Crandall Ranger Station	FS employee	Observed single light gray wolf

DATE	LOCATION	WHO	TYPE OF SIGHTING
late 5/96	Highway near Sugarloaf Mountain	Public	Observed single gray wolf
7/10/96	Gwinn Fork of Dick Creek	Public	Observed single gray wolf
9/1/96	Upper Pilot Creek	Public	Tracks of several wolves
9/6/96	Closed Creek	Public	Observed pack of 5-6 wolves
9/30/96	15 Miles SE of Yellowstone Lake on SNF	USFWS	Lone Star Male/Nez Perce Female

Evaluation

Only one pack from the original 1995 wolves has been documented to include part of the Shoshone National Forest in their home range. Radio-tracking in 1995 verified that part of the NE corner of the Clarks Fork District is included in the home range of the Soda Butte Pack. No radio relocations were reported from the U.S. Fish and Wildlife Service during FY 96 but there have been several observations of wolves or tracks in or close to the area identified as the Pack's home range (Table 6).

A lone male wolf that separated from the Soda Butte Pack, and was last located South of the Park, was found dead near Pinedale, WY on February 11, 1996. Another lone wolf, last located on February 10, 1996, was killed near Meeteetse, WY around the 30th of March, 1996. Both wolves, especially the one killed near Meeteetse, likely passed through the Forest. The Fish and Wildlife Service received a report of a gray radio-collared wolf near Lander, WY shortly before the wolf was killed in Meeteetse.

The only other report of wolves, other than singles or wolves suspected to be the Soda Butte Pack discussed above, was the Lone Star Male/Nez Perce Female that were documented on the Shoshone National Forest, 15 miles SE of Yellowstone Lake about September 30, 1996.

No wolves have been documented denning on the Forest. Because the Forest has considerable desirable wolf habitat in the form of migratory big game herds, it is probable that wolf use on the Forest will increase and denning will occur as recovery progresses. As more pups are born there will be more wolves without radio-collars, making tracking and documentation of use more difficult.

In accordance with provisions of the Endangered Species Act and pertinent regulations, the Forest is a cooperative partner in helping achieve recovery for this species.

WILDLIFE AND FISH

1. Cavity-Dependent Species Habitat

Monitoring of this habitat component, which generally takes several decades to produce, is designed to ensure it is maintained as part of overall Forest wildlife habitat diversity. Failure to ensure replacement habitat is being produced could result in decline in this habitat component and associated dependent species for many years.

Some monitoring of this element was completed for the Burroughs Creek/Cartridge and Ellsbury timber sales as well as the North Fork Highway/Pahaska riparian habitat improvement project. In addition, resolution of some past problems in manipulation of the Forestwide vegetation data base provided substantial information for an examination of present status and trend.

Evaluation

This issue was monitored and addressed in depth this year by a thorough examination of the Forest vegetation data with regard to the amount and distribution of wildlife habitat structural stages. That information and a narrative discussion of conclusions and implications is presented in the trend analysis part of this report. Generally speaking there is a relative abundance of late successional mature conifer forest habitat which should provide adequate snags for cavity-dependent species, now and in the future. It would be highly desirable to use available tools to regenerate areas capable of providing aspen, cottonwood, and other deciduous trees for the future needs of cavity dependent and other wildlife species, as this type is very limited on the Forest.

For the three specific projects mentioned above, the Forest Plan guidelines were followed in terms of ensuring the minimum number of snags or mature replacement snags for the given acreages would be available for cavity dependent wildlife. However, as pointed out in the 1995 monitoring report, because management activities such as timber sales have the potential to only affect a very small part of the Forest, the potential for either negative or positive effects on such species is probably miniscule. That assumes of course that the suited base area remains the same for each generation of the Forest Plan. Nevertheless the existing guidelines in the Plan do provide a safety net for cavity species in those areas.

It is recommended that in addition to following the Plan guidelines for specific projects, a Forestwide status/trend analysis be conducted once every five or ten years depending on budget and other priorities. Annual forestwide monitoring of this item does not appear to be necessary or particularly meaningful in view of anticipated changes as the Forest Plan is implemented.

It is also recommended that the Forest guideline to maintain at least 10% of forested diversity units in old growth be addressed by the North and South Zones in the next two years. Addressing would primarily mean identifying which 10% of forested areas to manage for this purpose.

2. Winter Range Carrying Capacity

During the past year, detailed observations and habitat and trend data collection were planned for three areas on the Shoshone's South Zone (Dunoir, Ramshorn/Parque, and Horse Creek allotments), and two allotment areas (Basin and Ghost Creek) on the North Zone. The sample areas planned for the South Zone allotments did not occur in elk crucial winter range but some do occur in moose winter range. They also occur in key areas representing spring and fall transition areas

important for elk and also for domestic livestock. The sample area for the Basin allotment occurs in key elk crucial winter range. Planned monitoring for the Ghost Creek allotment was primarily to establish transects for long term monitoring and none of those were planned in winter range although some winter range for elk and moose occurs in the lower part of the allotment near Crandall. In addition to this planned monitoring by Forest personnel, monitoring was also planned and carried out by Wyoming Game and Fish Department (WYG&FD) and Forest personnel on the North Fork Shoshone River drainage. No livestock grazing occurs in this area but in the past decade, migrating bison from Yellowstone Park have moved into this winter range area which is also utilized by elk, deer, and bighorn sheep. This has raised carrying capacity questions.

Evaluation

Five transects were established in the North Fork drainage in May near the Wapiti Campground , Wapiti Horsepasture, Clearwater Creek, Blackwater Pond, and Eagle Creek Trailhead. Photos were taken during May, July, and September, and sample areas were clipped in September on four of the five areas to estimate herbaceous production. Production figures varied from 288 to 1908 pounds per acre. The same sample sites will be clipped again this spring to determine utilization by bison and other wildlife.

The continued presence of trespass cattle in the Long Creek unit of the Dunoir allotment complicated monitoring and interpretation of monitoring results. Very high willow utilization due to total ungulate use occurred in the Lower Middle Fork of Long Creek (80%) and the East Fork of Long Creek (52%). Moderate to high use also occurred in the Upper West Fork of Long Creek. The amount of hedging on willow plants sampled also indicated these areas have received relatively high use by ungulates historically. While it is recognized that data collection is from a single year, it is recommended that the trespass livestock problem be solved so future monitoring data can be used to better address the effects of planned management actions.

The willow shrub condition data for the Horse Creek allotment indicated relatively high percentages in the moderate or closely hedged condition class in some areas. This indicates historic total ungulate use of relatively high proportions. Livestock use data on willows obtained during 1996 was relatively low. It is recommended that additional monitoring of these sample sites be conducted this spring to determine use by wildlife. Although definitive conclusions can not be drawn from one year's data, information of this type would be very useful in helping to focus management actions.

The data collected for the Ramshorn/Parque Creek allotment indicated moderate to high wildlife use of willows and herbaceous vegetation in Amoretti Park and Ramshorn Basin, and moderate to high use by cattle in Brent Creek. It appears that some limited additional monitoring in these areas could help prioritize management actions.

3. Fish Habitat Improvements

No new fish habitat structures were installed in 1996. Monitoring continued on the Pilot Creek and Horse Creek fish habitat enhancement projects. Details of the enhancements can be found in the 1995 Monitoring and Evaluation Report.

Evaluation

Although the Clarks Fork river migrated, somewhat eroding a portion of the stream bank, the road barrier and planted vegetation are doing well on the Pilot Creek project. Planted willows are growing slowly due to heavy moose browsing.

On the Horse Creek project, very high spring runoff during 1996 undermined a few of the structures but they still remained functional. High flows did wash out one of the log revetment structures. Since it was placed on the outside of a major bend in the river that had bedrock downstream, we decided not to replace it since it would likely be a continued problem and the stream could not really go anywhere due to the bedrock on the lower portion of the bend. Planted willow was highly successful. Fish surveys by Wyoming G&F personnel found an abundant trout population. Overall, the enhancement project has worked well although some of the structures should have been placed higher to the bankfull level which would have helped improved resistance to erosion.

5. Riparian Condition

Watershed field crews collected integrated information including channel morphology, instream fine sediment, aquatic habitat and some forage use to determine riparian condition on a cross section of reaches on the Wind River District in 1994 and 1995 and on the Washakie District in 1996.

Range crews collected information about forage use, vegetative composition and condition, channel morphology, stream bank alteration, instream fine sediment aquatic habitat and macroinvertebrates, where applicable in 1995 and 1996.

At the time the 1995 monitoring report was written, much of the watershed and range data that was collected had not been analyzed. As a result, the information that has been analyzed was combined and is summarized in this 1996 report. Detailed information can be found in the Shoshone Forest Supervisor's Office and in the respective District files.

Since 1994, the seasonal watershed crew and a seasonal range crew have been collecting various physical and biological data for use in stream health assessments. Initially, physical information was primarily collected. In 1995 and 1996 more biological information was also collected. Each year the criteria, methods and procedures have been refined and integrated to better evaluate overall stream health and riparian conditions including both physical and biological integrity.

Physical integrity is only a part of overall stream health and riparian condition. The physical component directly and indirectly affects the biological components. The Forest aquatic biologist has evaluated the available information collected on biological integrity. It includes vegetative condition, ungulate use, and aquatic habitat conditions.

In the future, this information will be used to evaluate overall riparian condition by taking all the available physical and biological components of the riparian system and reviewing them with an interdisciplinary riparian team. Some riparian conditions will be relatively easy to evaluate in situations that are very good or very poor. Others are more subtle and more difficult to interpret, especially if sufficient data or site visits are lacking. This portion has not been completed and will be included in future reports. Additionally, this group has and will continue to refine methods and procedures based on issues, available money and people.

On the next few pages are tables that summarize biological integrity at each reach (see Water Resource section for tables summarizing the physical aspects of the same stream reaches). Within each table there

are 3 columns. Columns' one and two contain the name of the stream where the reach occurs and a reach number. Column three contains a biological integrity assessment class, described as follows:

Column 3 describes biological integrity class based on the following criteria:

G (Good): The reach has the proper vegetation for the site potential. Ungulate vegetative use is within current standards and guidelines. Ungulate stream bank alteration has not adversely affected channel morphology and aquatic habitat, instream fine sediment levels are acceptable for natural geologic conditions. A cow-fish habitat rating of good or excellent. Potential aquatic habitat is being provided for aquatic species.

F (Fair): The reach has at least some portion of the proper vegetation for the site potential. Ungulate vegetative use is approaching levels that exceed standards and guidelines. Ungulate stream bank alteration is having some affects on channel morphology. Instream fine sediment levels are approaching unacceptable levels for natural geologic conditions. A cow-fish habitat rating of fair to poor. Some of the potential aquatic habitat is being provided for aquatic species.

P (Poor): There has been a vegetative site conversion on the reach. Ungulate stream bank alteration is or has adversely affected channel morphology and aquatic habitat. Instream fine sediment levels are unacceptable for natural geologic conditions. A cow-fish habitat rating of poor. Very little potential aquatic habitat is being provided for aquatic species.

U: Unable to assess due to incomplete or no biological information.

Table 7. Clarks Fork District

Reach Name	Reach Number	Biological Class
Lodgepole	101	U
Barrs	117	F
Barrs	118	G
Ghost	119	G
Ghost	120	P
Ghost	121	P
Exclosure	122	F

Table 8. Greybull District

Reach Name	Reach Number	Biological Class
NF Dick	108	G
NF Dick	113	F
NF Dick	114	P

Table 9. Washakie District

Reach Name	Reach Number	Biological Class
Dickinson	133	F
Sand	134	G
Cole Spring	115	P
Squaw	116	G
MF Popo Agie	131	G
Sawmill	124	F
Sawmill	127	G
Crooked	136	P
Canyon	132	F
Louis Lake	128	G
Hidden	137	F
L Popo Agie	135	F
Snow	129	G
Snow	130	G
Slate	125	F
Rock	123	F
Rock	126	G

Table 10. Wind River District

Reach Name	Reach Number	Biological Class
Bonneville	97	G
Brooks Lake	98	G
W Brooks Lake	99	P
West Dunoir	10	U
West Dunoir	11	U
Dunoir	33	U
Dunoir	34	U
Dunoir	35	U
Dunoir	36	U
Dunoir	37	U
Frontier	1	U
Frontier	2	U
Frontier	13	U
Frontier	14	U
Frontier	15	U
Frontier	16	U
Frontier	24	U
Frontier	25	U
Frontier	26	U
Frontier	32	U
Frontier	38	U
Frontier	39	U
Wiggins	17	U

Table 10. Wind River District (continued)

Reach Name	Reach Number	Biological Class
Wiggins	18	U
Wiggins	19	U
Wiggins	20	U
Wiggins	27	U
Wiggins	28	U
Wiggins	29	U
Wiggins	30	U
Fire	6	U
Snow Lake	7	U
Caldwell	12	U
Castle	5	U
EF Wind	21	U
EF Wind	22	U
EF Wind	109	U
Alkali	90	U
Bear	23	U
Bear	31	U
Wayne	91	U
Wiggins	3	U
Wiggins	4	U
Cartridge	8	U
Charlie	89	P
Parque	41	U

Table 10. Wind River District (continued)

Reach Name	Reach Number	Biological Class
Burroughs	42	U
Horse	110	G
Horse	111	G
Burroughs	88	U
Burroughs	139	U
Parque	41	U
Parque	140	U
Little Horse	40	U
Tappan	138	F
WF Long	85	P
WF Long	104	P
WF Long	141	P
MF Long	105	F
MF Long	106	P
MF Long	142	P
MF Long	143	P
EF Long	144	F
Wind	107	U
Sheridan	112	U
Green	86	U
Trappers	87	U
SF Warm Spring	92	U
Camp	93	U

Table 10. Wind River District (continued)

Reach Name	Reach Number	Biological Class
Trout	94	F
Fish Lake	95	U
Coyote	96	U
Enos	103	U
Salt	100	U
Warm Spring	102	U

Evaluation

Physical Integrity

Over one hundred individual reaches of stream have been assessed for *physical integrity* since 1994. Fifty-six reaches are in Class I condition, twenty-three are in Class II, and twelve are in Class III. Condition on eleven reaches cannot be fully assessed until additional information is collected. Causative factors resulting in Class II and III conditions have been identified as have recommended corrective actions (see Stream Health Assessments in Water Resources section).

Of concern on most reaches is the delivery of sediment from the transportation network to the stream system. Improving erosion control by disconnecting the transportation system from receiving streams would be beneficial to maintaining or improving physical integrity.

Many reaches are still in a recovery mode from past management. Time is the most appropriate remediation for these reaches. There are some reaches where recovery may be accelerated through land treatment measures. These possibilities need to be pursued.

Some reaches are being negatively impacted by ungulate use. Better enforcement of permits and proper management of big game numbers would be beneficial for correcting these situations.

Biological Integrity

Very limited biological information was collected in 1994. Aquatic habitat and some vegetative use was collected in 1995. More detailed biological information was collected in 1996. Of the 41 reaches on the Forest where there was enough information to make an initial determination on biological integrity 15 were rated in good condition, 14 were rated fair and 12 were rated poor.

Improper livestock use and excessive fine sediment levels were of most concern. Strict permit administration and compliance would help improve conditions. In some areas big game were adversely affecting riparian vegetation. Big game populations need to be managed within the carrying capacity of the habitat in order to maintain the long term integrity of riparian vegetation. Livestock impacts were most often to vegetation and then to stream banks, particularly those that are not well armored. Wildlife impacts were primarily to vegetation. Excessive instream fine sediment

above natural levels was a concern in some reaches. Much of this can be traced back to poor road conditions. Improved road maintenance and drainage would help reduce fine sediment levels.

6. Population and Habitat Trend of MIS

The Forest Plan documents the identification of seventeen management indicator species in addition to game trout to reflect management needs for all species inhabiting the Forest. Although it is required by current law, it is still debated in the academic, scientific and wildlife management communities whether this is a desirable approach to planning and implementing wildlife habitat management goals.

The Forest uses this item as only one of many tools to help set management goals and guide management actions. Some monitoring of the anticipated effect of management actions on MIS species was completed this year for the Burroughs Creek/Cartridge and Ellsbury timber sales, management actions proposed for 32 range allotments, and the North Fork/Pahaska riparian habitat improvement project. In addition, resolution of some past problems in manipulation of the Forest-wide vegetation data base provided substantial information for an examination of present status and trend of each of these species.

Evaluation

This issue was monitored and addressed in depth this year by a thorough examination of the Forest vegetation data with regard to the amount and distribution of habitat generally associated with most of these species. Other available information was also utilized to address the population or habitat status and trend for various species in this group. A discussion of conclusions and implications from analysis of that data is presented in the trend analysis part of this report. Generally speaking there is reason to be optimistic about the status and trend for most species except those more closely tied to deciduous hardwoods such as the ruffed grouse. It would be highly desirable to use available tools to regenerate areas capable of providing aspen, cottonwood, and other deciduous trees for the future well being of these species.

For the specific timber sale and other projects mentioned above, Forest Plan standards and guidelines were followed to ensure a diversity of habitat situations including that for all MIS species is maintained on the Forest. The effects of proposed management actions on MIS species were considered in the above project proposals as appropriate.

It is recommended that in addition to following routine project planning procedures which take into consideration effects on MIS, that a trend analysis such as the one contained in this report (see Trend Analysis section of this report) be completed only once or twice each decade if MIS are maintained as a planning tool. Management activities on this Forest typically do not have the potential to effect changes that would warrant an annual trend analysis.

Additional MIS - Yellowstone Cutthroat Trout

Due to an extended period of high water during the 1995 Spring runoff, research was delayed on the North Fork of the Shoshone River until 1996. Researchers surveyed reaches representative of 382 miles out of the 478 miles (80 percent) of potential fish habitat present in the North Fork system upstream of the Buffalo Bill Reservoir. They found the drainage supports a very good fishery with (in order of abundance) hybrid rainbow-cutthroat trout, brook trout, rainbow trout, Yellowstone cutthroat trout (YSC), whitefish, brown

trout, longnose dace and longnose suckers. In no location of the North Fork and its tributaries was a population of pure YSC found. No cutthroat trout populations were found above an upstream fish barrier. All upstream fish migration barrier sites were barren. Good fish habitat conditions were found considering the geomorphology of the area.

Because of the concerns of the status of native cutthroat trout populations throughout the West a Habitat Conservation Assessment for Inland Cutthroat Trout was completed by the Forest Service in 1996. It describes the historical and current distribution, status and habitat management implications for these species including YSC. Additionally, a YSC management guide was recently developed cooperatively in Montana and is currently being reviewed by the Wyoming Game and Fish Department.

The Forest also conducted integrated riparian habitat surveys addressing physical and biological components including the condition of trout habitat, where applicable (see Riparian Condition section above).

Evaluation

The Forest plans to conduct further integrated riparian surveys including fish habitat on various reaches of streams in the North Zone with the watershed and range crews, if they are funded. The University of Wyoming will conduct further research on the South Fork of the Shoshone River for YSC distribution and habitat in 1997.

RANGE

1. Grazing Use

This monitoring item is defined as the amount of forage used by permitted commercial livestock on the Forest and does not account for the amount of forage consumed by recreation visitor livestock.

Commercial Livestock: Management practices, such as grazing, and their proposed outputs are listed in Chapter III of the Forest Plan (see table III-1, pages III-13 to III-14 for range projections). The Plan predicted an average annual output of 78 thousand animal unit months (AUM) for cattle and horse grazing and 25.4 thousand AUM for sheep and goats for the period of time between 1985 and 2000. It also predicted total Forest commercial livestock grazing at 103.4 thousand AUM annually. The allocation is currently lower than what the Plan predicted because a number of allotments (4 or 5) are no longer allocated for commercial livestock. The allocation for cattle and horses is 77.4 thousand AUM and that for sheep is 20.3 thousand AUM, or a total of 97.7 AUM.

Authorized commercial livestock use on the Forest for the last 11 years is displayed in table 11. Authorized non-use is grazing use offered but not taken by the permittee for personal reasons or for resource protection. Vacant allotments are available for grazing, but are not being grazed due to lack of demand from the livestock industry (mostly sheep) or because grazing permits have been waived back to the Forest Service and new permits have not yet been issued.

Table 11. Actual Available Commercial Livestock Grazing Use (1,000 AUM)

Year	Cattle/Horse	% of Plan	Sheep/Goat*	% of Plan	Total	% of Plan
Plan	77.4		20.3		97.7	
1986	54.6	71	3.5	17	58.1	60
1987	58.6	76	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	0.9	5	50	51
1993	56.0	72	1.4	7	57.4	59
1994	53.6	69	0.4	2	54	55
1995	56.8	73	0.2	1	57	58
1996	56.8	73	1.3	7	58.1	59

*** AUMs in this column represent sheep grazing use. No commercial goat grazing is occurring on the Shoshone.**

Evaluation

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

2. Forage Utilization

In 1996, utilization studies were completed on 18 allotments (listed below) or 23% of a total of 77 allotments grazed.

> Bald Ridge, Basin, Crandall, Table, Ghost Creek, Lake Creek, Face of the Mountain, Little Rock, Dick Creek, Horse Creek, Ramshorn, Parque Creek, Union Pass, Dickinson Park, Sawmill, Bayer Mountain, Ed Young Basin, DuNoir.

Allowable forage utilization is determined by applying the allowable use guides in the Forest Plan to the grazing system being implemented on the ground. Most of the allotments on the Shoshone are managed under a deferred rotation grazing system. Under this system, grazing is delayed or discontinued on a given area or unit of the allotment for a period of time to allow for plant reproduction, establishment of new plants or recovery of existing plants.

Evaluation

In general, during the 1996 grazing season, forage utilization did not exceed acceptable standards in any one allotment. In some instances, utilization for specific areas within allotments did exceed acceptable standards. The level of utilization within these areas was not representative of the average utilization within the entire allotment and did not exceed acceptable standards by more than 10% on the allotment.

3. Range Condition and Trend

In 1996, field exams were conducted on 17 allotments (listed below) by a range resource specialist and/or one of two interdisciplinary field crews. Data was collected using various techniques such as re-reading permanent trend transects, re-taking photo points, establishment of condition/trend transects in "key areas", browse transects and other approved methods found in the Region 2 Range Analysis Handbook.

Allotments monitored were:

> Bald Ridge, Basin, Crandall, Table, Ghost Creek, Lake Creek, Face of the Mountain, Little Rock, Ed Young Basin, Bayer Mountain, Sawmill, Dickinson Park, Union Pass, Warm Springs, DuNoir, Horse Creek, Ramshorn/Parque Creek.

Evaluation

Preliminary findings, of the data collected in 1996, indicate that except in a few problem areas, overall conditions are improving. Resource conditions are moving toward the desired future condition. This positive trend can be attributed to improved management practices by permittees and to stocking levels which have been declining over the past several decades.

4. Allotment Management and Permittee Plans

The Shoshone National Forest has been involved in the permit issuance and allotment management plan (AMP) analysis effort. Environmental analysis was conducted on a number of allotments where National Environmental Policy Act (NEPA) analysis is necessary. The Forest has focused on allotments where past monitoring indicated that some adjustment in the grazing system, level of permitted numbers, or season of use will help the resource move more rapidly toward the desired future condition than under present

management. Analysis was initiated on 36 allotments in FY 95 which will result in decisions, AMPs, and permits on 32 allotments in 1997. These allotments are:

Basin, Lake Creek, Little Rock, Dick Creek, Kirwin, Wood River, Sugarloaf, East Fork, Sunshine, Timber Creek, Francs Peak/Yellow Steer, Carter Mountain, Meeteetse Creek, Bobcat, Ishawooa Hills, Community, Hardpan, Hunter Creek, Valley/Boulder, Dickinson Park, Hays Park, Meadow Creek, Squaw Creek, Doby Cliff, Fish Lake, Salt Creek, Horse Creek, Ramshorn, Parque Creek, Whiskey Mountain, Wiggins Fork and Bear Creek.

Review and development of allotment management plans and annual grazing instructions is required by the Forest Plan. The annual instructions specify the rotation schedule, number of livestock, the season of use and any other instructions or permit conditions that will assist in the management of the resource and implementation of Forest Plan standards.

Evaluation

In 1994 and 1995 AMPs were reviewed and updated. In 1995, environmental analysis was initiated on 36 allotments, or 41% of all livestock allotments on the Forest. Annual operating instructions were issued to all permittees authorized to graze livestock on National Forest Lands.

5. Forage Development (Range Readiness)

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

Evaluation

The "on" dates of the following eight allotments were field checked in 1996 to confirm the on date: Timber Creek, Dick Creek, Community, Ishawooa Hills, Rock Creek, Valley/Boulder, Wood River, Deer Creek.

6. Noxious Weeds

The forest is actively involved in site identification and control of noxious weeds. In all cases an integrated management approach is used. This includes improved livestock management, a Special Order requiring the use of only certified weed free hay on the forest, cooperative agreements with the local Weed and Pest Districts, participation in Weed Management Area boards, application of herbicides and the introduction of biological controls where available.

Evaluation

In 1996 415 acres were treated to control noxious weeds. In addition, several thousand acres were surveyed for the presence of noxious weeds.

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 Shoshone Forest Plan was amended in August 1994 to reflect a recalculated (ASQ). Monitoring since the Forest Plan was written in 1986 indicated that timber data and assumptions used in the Forest Plan analysis had overestimated the amount of timber that the Forest could produce. The allowable variability of 5 percent was being exceeded. This coupled with the fires of 1988 which burned over 9,000 acres of suitable timber land resulted in the need to amend the Forest Plan. The revised ASQ is 45 million board feet (MMBF) or an average annual of 4.5 MMBF.

Evaluation

In 1986 the Shoshone Forest Land and Resource Management Plan was released. It set an ASQ of 112 MMBF over the ten year planning period or an average annual volume of 11.2 MMBF on a suitable timber land base of approximately 86,000 acres. Implementation and monitoring indicated that the volume per acre predicted by the Forest Plan was unrealistic. There were several reasons for this problem:

- Data used in the Forest Plan did not completely reflect the situation on the Forest. Timber stands were assumed to be uniformly forested when in fact many have inclusions of non-forested areas such as rock outcrop or grassy openings. Timber data collected since the Forest Plan was published was used to re-analyze the ASQ.

- Growth and yield projections used in the Forest Plan were ambitious. For example, the Forest Plan assumed that over an average rotation of 120 years, every acre of suitable timber land would have to produce over 15 MBF per acre. On average, timber sales sold between 1986 and 1992 (for which volume and acreage figures were available) yielded an average volume per acre of 8.5 MBF per acre. Forest Plan data mentioned above contributed to yield overestimation. Also contributing are limitations inherent in growth and yield models.

The situation was compounded by the 1988 Clover-Mist fire which burned approximately one third of the timber base on the Clarks Fork District. Another 11,000 acres of suitable timber adjacent to or near the burned areas were deferred from harvest. Once the bulk of the timber salvage was removed, the volume offered annually came down to 4 to 5 MMBF per year.

The problems mentioned above were addressed in the ASQ recalculations and the Forest is currently operating at an ASQ of 45 MMBF for the next decade or at an annual average of 4.5 MMBF until the Forest Plan is revised. Approximately 3.4 MMBF of sawtimber and some multi-product sales were offered and sold in FY 1996. In addition to this volume in FY 1996 the forest offered and sold approximately 2.3 MMBF in personal use fuelwood, post and poles and other product sales

2. Restocking of Clearcuts

This monitoring item was included in the Shoshone National Forest Plan to insure that restocking occurs by the 5th year following a clearcut. Restocking of clearcuts is a requirement of the National Forest

Management Act (NFMA) which states 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)).

Since 1989 only 56 acres of the Shoshone National Forest have been treated by the clearcut regeneration harvest method. These acres represent three timber sales on the Wind River district:

Table 12. Acres Treated by Clearcuts in the Last Five Years

Sale Name	Final Harvest	Acres
Union Pass Blowdown Salvage	06/01/92	22
Trapper Creek	06/01/92	12
Wildcat Blowdown Salvage	09/30/92	22

The Forest Plan requires that this item be monitored by regeneration survey. The Union Pass Blowdown, Trapper Creek and Wildcat Blowdown Sales are programmed in the FY 97 workplan to have the 5th year regeneration surveys done.

Evaluation

Clearcut areas are monitored on the Shoshone the 1st and 3rd years after harvest although they are not documented unless a problem is noted. The major effort goes into verifying that restocking will occur 5 years after harvest. As mentioned above, the 1992 clearcuts will be surveyed for regeneration in 1997.

In addition to regeneration surveys on recently harvested acres, the Forest has dedicated considerable time visiting, evaluating and surveying acres treated by clearcut prior to the passage of the NFMA in 1976, in order to update records and evaluate past silvicultural treatments on the Forest. Regeneration limitations are often due to site preparation or slash disposal methods applied prior to passage of the NFMA. The vast majority of acres of clearcut on the Shoshone were treated prior to 1976. Although the NFMA only required surveys on those lands harvested after enactment of the act, the Forest has chosen to expend effort on evaluating previously harvested acres.

In FY 96 on the South Zone of the Forest (Wind River and Washakie Districts), 1742 acres received regeneration surveys and a total of 1997 acres were certified. On the North Zone of the Forest, (Clarks Fork, Wapiti and Greybull Districts), the Clarks Fork District conducted 1st year regeneration surveys on 611 acres, 3rd year regeneration surveys on approximately 498 acres and approximately 646 acres of 5th year regeneration surveys on plantations that were established after the fires of 1988. The areas that were surveyed on the Clarks Fork District are not associated with clearcut harvest methods. These areas were planted to establish tree stands on suited lands that were damaged and devoid of live trees due to the fires of 1988.

3. Timber Stand Improvements

Timber stand improvement (TSI) are vegetation management activities that improve the composition, condition or growth of a stand of trees. This monitoring item requires that acres of timber stand improvement not vary more than 25% from what is planned annually. The Forest Plan projected 121 acres per year of Timber Stand Improvement for the time period between 1991 and 2000 (Land and Resource Manage-

ment Plan, Table III-1, page III-14). Between 1991 and 1996 the Forest treated a total of 954 acres or an annual average of 159 acres. The following is a list of the acres of TSI projected by the Forest Plan and accomplished for the last six years:

Table 13. Timber Stand Improvement 1991-1996

Year	Forest Plan	Acres Treated	% of Forest Plan
1991	121	40	67
1992	121	407	336
1993	121	0	0
1994	121	140	115
1995	121	250	206
1996	121	117	97
6-yr Avg	121	159	131

The focus of TSI activities on the Forest has been in past cutover areas. The goal is to enhance new stand growth by reducing competition on desirable species and to promote individual tree growth. Most of this work is done through the use of TSI contracts which are inspected by Forest personnel. Payment to contractors is approved after they meet the minimum requirements of the contract and the inspectors approve the units. Force account crews and seasonal work crews under the guidance of a forester are also utilized. Accomplishments for the period shown above were monitored on the ground by contract inspectors and foresters, through the use of daily diaries and inspection reports.

Evaluation

Between 1991 and 1996 the Forest accomplished approximately 131% of what the Forest Plan projected for acres of TSI. In FY92, 336% of the projected acres of TSI were completed and in FY95, 206% was accomplished. The Forest exceeded the 25% allowable variability in both years. It should be noted that some of these contracts are multi-year contracts and therefore acreage accomplishments will vary from year to year. In some years accomplishments may exceed the planned acreage target while in others they are under estimates.

4. Growth Response

Growth response is monitored by Forest personnel through stand exam surveys. In FY 1996 the Forest surveyed 7300 acres, which is in addition to information gathered during the regeneration surveys mentioned in section 2 of this report. Both of these surveys are used to monitor growth and growth response of timber stands on the Forest.

Growth response of timber stands to vegetative treatment was reviewed on the Shoshone as part of the 1994 Allowable Sale Quality (ASQ) amendment to the Forest Plan. Following the release of the 1986 Forest Plan, it was noted that the predicted yields were not being realized in some cases (see discussion under Allowable Sale Quantity heading). The ASQ amendment addressed those issue and modifications were made to the growth and yield tables to correct some of the discrepancies.

Evaluation

In predicting timber yields for the Shoshone Forest, the Forest Plan assumed a level of treatment, particularly thinning, that is not being realized. Some prescriptions modeled 2 or 3 thinnings prior to harvest to stimulate growth. On the ground monitoring indicates we don't get the growth response projected in the Forest Plan and timber stands are, for the most part, thinned once prior to harvest.

5. Size of Clearcuts

Clearcuts greater than 40 acres in size require the Regional Forester's approval. Clearcuts on the Shoshone National Forest have not exceeded the 40 acre maximum. (See discussion under Restocking of Clearcuts heading for additional information).

6. Openings Created by Management Activities

This monitoring item was intended to assure that openings created by management activities not exceed the size of adjacent natural openings 20 acres or more in size. This says, in effect, that management activities should not result in an opening greater than 40 acres.

Vegetation management activities which will result in openings in forested areas are monitored through the interdisciplinary team process before activities occur. Areas selected for treatment are reviewed in an interdisciplinary forum to make sure openings created by management activities will not exceed the maximum requirements of key wildlife indicator species.

Evaluation

Openings created by management activities have not exceeded the specified limits. The Shoshone will continue to monitor openings in forested areas created by management activities to assure that desired future conditions are met and that standards and guidelines are being followed.

7. Lands not Suited for Timber Production

This monitoring item was designed to monitor vegetative treatment on lands which are outside the timber suited base. Within the suited base, vegetative treatment may occur for the goal of producing timber. On lands not suited for timber production, vegetative treatment is one of several tools that may be used for other purposes, such as wildlife habitat enhancements, removing trees from the clearing limits for highway construction or reconstruction, powerline clearing, etc. Wood fiber production may be a by-product but is not the goal.

Standards and guidelines in the Plan specify what types of activities are permissible outside the suited timber base and are reviewed before activity occurs.

Evaluation

Two vegetative treatment projects were proposed in 1995-1996 on the Washakie District to create a migration corridor for bighorn sheep. A timber sale contract was used to achieve this treatment. The Poleback Sale was advertised and sold and is 75% complete. The Switchback Sale was advertised but did not sell. The district is evaluating other methods of treating the Switchback Sale area.

Additionally, a fuel treatment project will be accomplished in FY 97 on approximately 60 acres on the Washakie District. A service contract will be used to achieve this treatment. Mandatory removal of all designated trees in the contract area will be specified in the contract. Slash will piled by the contractor and the slash piles will be burned by Forest personnel after contract completion. Forest Service personnel will administer and monitor contract progress. The purpose of this fuel treatment project is to reduce the amount of woody vegetation on National Forest land directly adjacent to homes on private land.

In FY 1996, on the Wapiti District, the first phase of reconstruction of the North Fork Highway began. It was determined that the best way to complete the clearing limits for the highway reconstruction, as well as the clearing limits for the relocation of powerlines, phonelines, and riparian area enhancement, was through the use of timber sale contracts. Five timber sale contracts were used to achieve the necessary clearing of vegetation for this first phase of the project. All five of these contracts were administered by Forest Service personnel. Monitoring and contractual compliance was accomplished through daily, bi-weekly and weekly visits by various contract administrators during the operational period of each contract. In addition to timber sale contracts, personal use fuelwood collection was encouraged in the construction area on weekends when construction activities were not in progress. Fuelwood collection was only allowed in designated locations. Enforcement and monitoring of this activity was done with Forest Service Law Enforcement Officers, Recreation, Special Use, and Timber personnel from the Forest with training in Law Enforcement and permit and or contract administration experience.

Annually, an estimated 2.0 MMBF of products other than sawlogs (fuelwood, post and poles, etc.) are sold from both suited and non-suited timber lands on the forest. Approximately half of that (1 MMBF) comes from lands not suited for timber production.

WATER RESOURCES

1. Water Quality Trend: Effects of Specific Resource Management Practices on Water Yield/Quality; Verification of Models/Coefficients Used to Predict Effects in the Plan and to Set Threshold Levels

Water resource monitoring on the Shoshone National Forest has and continues to occur in many programmatic and project level arenas. More specifically:

Programmatic Level Monitoring

Review of Forest Plan Chapter IV Water Resources Monitoring Requirements

The Shoshone National Forest Land and Resource Management Plan (LRMP) includes monitoring requirements for water resources. These requirements are found in Table IV-1 (page IV-8). These requirements, in part, are no longer current with either the science of watershed management or Regional direction.

The monitoring requirements were written in the mid-1980's, more than fifteen years ago. Since then, much has been learned. Not only has watershed management on National Forest lands evolved as a science, but watershed issues and concerns have changed, as have budgets, workloads, and available workforce. Because of this, some narrative in the table is no longer current. More specifically,

1) The table lists four monitoring items. Some confusion exists as some people interpret only two items exist - water quality trend and water uses. The semicolons between items one, two, and three are probably the cause of the confusion. This confusion could easily be corrected by replacing the semicolons with periods. However, such a simple task does not totally solve the situation. The monitoring items themselves, as worded, are no longer current. More discussion on this is forthcoming.

2) The data source and techniques to be used in monitoring the first three items are, as indicated in the table, defined in the Shoshone National Forest Water Resource Monitoring Plan. This plan was approved in 1985, but, for several reasons as described later, has never been fully carried out.

3) The table calls for annual monitoring reports and updates to the water resource inventory. The inventory has been maintained, but annual reports have not been prepared every year.

The Water Resources Monitoring Plan contains two objectives. They are:

"monitor streams or lakes on the Forest to identify trends in quality to provide a basis for water management planning", and

"monitor management activities on the Forest in order to ensure that water quality standards are met and that necessary best management practices are developed and applied".

The first objective was designed to address the trend analysis monitoring item. The objective was to be met through establishment of a set of permanent stations, monitored routinely at specified intervals, through the collection of chemical water quality parameters. Eleven stations were to be established. None of the eleven stations were ever established.

This monitoring item and its associated objective were developed at a time when it was believed chemical water quality monitoring and permanent water quality trend stations were beneficial for monitoring land management on National Forests. Extensive reviews and conversations with the Environmental Protection Agency (EPA) and State water quality agencies within Region 2 have produced consensus that water chemistry is rarely the real problem. Rather, the concern is with aquatic habitat variables, mainly sediment. The Rocky Mountain Region watershed management staff has actively discouraged generic water column chemistry measurement unless a precisely defined need for the data develops. Regional direction has shifted toward sediment and stream health determinations for waters of the U.S., with a focus on reporting in State 305/319 reports. In response to the change in direction, the Shoshone National Forest has fielded watershed/stream health assessment crews over the past few years to inventory and monitor watershed condition and stream health. Current efforts are scheduled to continue as displayed in out year budget planning.

The second Water Resources Monitoring Plan objective was developed to address the second LRMP monitoring item. Again, as previously mentioned, efforts in the mid-1980's centered around the water chemistry side of water quality. Additionally, there was a concern at the time timber harvest, particularly clear cutting, resulted in a large enough increase in water yield that stream channels could erode at an unacceptable rate. Research has shown such effects can occur, but are unacceptable only when timber harvest prescriptions are designed outside Best Management Practices (BMP's). Besides this, timber harvest levels have declined and clear cutting is no longer a common silvicultural practice. Today's concerns are with proper project design and implementation of effective soil and water conservation practices that disconnect the project from the watershed drainage network to eliminate or significantly reduce the amount of delivered sediment to waters of the U.S. Current protocols used by the Shoshone Forest are supported by the Regional Office and have had extensive review by EPA and the State of Wyoming Department of Environmental Quality (WyDEQ).

The third monitoring item - verification of models/coefficients used to predict effects in the Plan and to set threshold levels - was developed with good intention. Computer models are useful tools, provided they can be adapted to the situation under analysis. During LRMP development it was believed HYSED was an adequate model to predict land management effects on National Forests in Region 2. Region 2 has since withdrawn its support for continued development of process models overall and HYSED in particular. This was done primarily because there are too many unknowns, both for data input and the processes being modeled, to ever replace good, competent field investigation and professional judgement. The Shoshone Forest now uses a watershed cumulative effects analysis screening process to focus the field inventory and monitoring efforts previously discussed. The Forest also actively monitors projects across the Forest for soil and water mitigation implementation and effectiveness. This approach for predicting effects in the Plan is being adopted, in whole or part, by many other Forests in Region 2 and the nation.

The fourth LRMP monitoring item - water uses - remains current as written.

Evaluation

The above narrative shows the water resources monitoring section of Chapter IV needs to be updated and revised to make it current with either the science of watershed management or Regional direction. More specifically the following items should be considered:

> Revise and update the Shoshone National Forest Water Resource Monitoring Plan. De-emphasize trend monitoring for cumulative effects and project effects monitoring.

Eliminate "water quality trend" and "verification of models/coefficients used to predict effects in the Plan and to set threshold levels" as Forest Plan monitoring items. In concert with this, delete the use of HYSED as Forest direction (blue pages in the LRMP).

Change "effects of specific resource management practices on water yield/quality" to "effects of specific resource management practices on waters of the U.S.".

Tentatively, change the Data Source/Techniques Used narrative to read "Objectives and protocols are defined in the revised Shoshone National Forest Monitoring Plan. Areas or sites to be monitored depend upon watershed cumulative effects analysis screens and project NEPA mitigation measures and monitoring requirements. Monitoring results will be presented in project reports as appropriate or summarized in the annual Forest Plan Monitoring and Evaluation Report, as appropriate. State reports will be kept current". Develop final wording after completion of the Water Resource Monitoring Plan revision. Changes in the Allowable Variability from Plan Objectives narrative may then be necessary also.

Some above items are currently being considered by the Forest as part of a proposed Plan amendment to update Chapter IV. Any remaining items should be considered through other amendments or during Plan revision.

Transportation System Monitoring and Inventory

Since 1994, a seasonal watershed crew has been inventorying the transportation network on the Forest. The focus of this work has been to assess effects on watershed condition and stream health. Information useful to other resources such as engineering, recreation, and wildlife are collected as well. In 1996, the crew finished field work on the Washakie and Wind River Districts. The crew is scheduled to conduct field work on the Greybull, Wapiti, and Clarks Fork Districts in 1997.

Evaluation

Transportation network information is presently being digitized into the Forest GIS. Condition and use data is presently being entered into a Forest database. The field data provides the most detailed information ever collected on the Forest transportation network. The information will be extremely valuable at Plan revision. It has already been used to set priorities for watershed improvement project needs and some road maintenance needs.

A cursory review of the data identified several areas of concern: transportation networks are expanding in some areas, most notably the southern end of the Washakie District, primarily due to fuelwood collection; some old timber harvest roads, primarily on the Wind River District, were ineffectively waterbarred and closed or obliterated and thus continue to erode or receive use by the public; many roads drain directly into streams (e.g., - inside ditches) and thus need intermediate drainage to divert runoff into filter strips; many two-track roads open to public use are eroding at an unacceptable level primarily because of a lack of erosion control or existing erosion control is breached because the roads are used when wet.

The Forest is presently conducting a more detailed analysis of the data. The analysis could lead to identification of travel management, watershed improvement project and road maintenance needs.

Stream Health Assessments

Since June of 1994, the previously mentioned seasonal watershed crew and a seasonal range crew have been collecting physical and biological data for use in stream health assessments. The physical data have been reviewed by a hydrologist for an assessment of physical integrity. Adequate physical integrity means the stream reach is in dynamic equilibrium. Dynamic equilibrium is the continual adjustment of stream forms and processes within a natural range of conditions, interrupted only by extreme disturbance (reset) events. Three primary integrity questions are considered during an assessment: does the stream have access to its flood plain, can it transport its sediment load, and is the water table being maintained? However, physical integrity is only a part of stream health. Biological integrity is important as well. The Forest aquatic biologist does the biological integrity assessment (see Riparian Condition Section).

Field work is conducted on a reach of a stream, not the entire stream. A reach varies in length, but is commonly 1000 feet long. Field work has purposefully focused on reaches of streams where concerns with stream health are known or suspected. Many known or suspected stream health concerns are so because of past management activities. Heavy grazing in the early 1900's, tie-hacking in the early and mid-1900's, and large-scale timber harvest and road construction activity between 1950 and the 1980's are examples. This disclaimer is important because the Forest contains many more miles of stream where health is not a concern than miles where it is.

On the next few pages are tables that summarize physical integrity at each reach. Within each table there are five columns. Columns' one and two contain the name of the stream where the reach occurs and a reach number. Column three contains a physical integrity assessment class, described as follows:

> Class I: The reach is in dynamic equilibrium because hydrologic function has not been compromised. Physical integrity within the reach is not jeopardizing State designated beneficial uses.
>
> Class II: Dynamic equilibrium is stressed because hydrologic function has been partially compromised due to current disturbances (within or upstream of the reach) or because the reach has not yet fully recovered from past damage. Therefore, physical integrity within the reach is jeopardizing full support of State designated beneficial uses. The reach can recover in the short-term through revised management or minor project work within or upstream of the reach.
>
> Class III: The reach is not in dynamic equilibrium because hydrologic function has been severely compromised due to current or past disturbances. Physical integrity within the reach is not supporting State designated beneficial uses. The reach can recover only over a long period or through major project work within or upstream of the reach. Land disturbing actions do not need to be precluded, but they do need to complement hydrologic function recovery.
>
> Class U: Extenuating circumstances, such as loss of part of the seasonal crew to return to college, resulted in incomplete data collection on this reach. Therefore, an assessment cannot be completed until additional information is collected.

Column 4 identifies causative factors if the reach is in class II or III condition. The types of causative factors are:

1. Wildfire

2. Past damage - livestock grazing prior to the 1980's; large scale timber harvest and road construction prior to the 1980's; tie-hacking; unregulated two-track road development by off-road vehicles

3. Current ungulate grazing within the reach

4. Current ungulate grazing upstream of the reach

5. Transportation system location, drainage or use

6. Recreation activity - dispersed camping, off-road vehicle use, recreational livestock, recreational special uses

Column 5 lists recommended remedial actions that could be taken to return Class II and III reaches to Class I. The potential types of remediation are:

1. Time

2. Travel management

3. Transportation system maintenance (improved drainage, erosion control, closure, or obliteration)

4. Strengthened ungulate use management

5. Improved recreation use management and permit administration

Following each table, which are arranged by District, is narrative that describes where the reach is located and general information on the major activities occurring within the watershed. This narrative is by Planning Watershed in order to group related reaches.

Table 14. Clarks Fork District

Reach Name	Reach Number	Class	Cause	Prescription
Lodgepole	101	III	1	1
Barrs	117	II	2, 5	1, 3
Barrs	118	I		
Ghost	119	II	4, 5	
Ghost	120	III	2, 3, 4, 5	1, 3, 4
Ghost	121	II	2, 3, 4, 5, 6	1, 3, 4, 5
Exclosure	122	I		

Planning Watershed C25B

Lodgepole Creek (101)

This reach is upstream of the Crandall Creek Ranch irrigation withdrawal and downstream of the Reef. Primary management activities in the watershed are timber harvest and roading. Most of the watershed was burned by the 1988 Clover-Mist Wildfire.

Planning Watershed C06A

Barrs Creek (117)

This reach is parallel to the Morrison Jeep Trail, in an alpine meadow. Primary management activities in the watershed are grazing and roading.

Barrs Creek (118)

This reach is upstream of reach 117. It is in the alpine. The primary management activity in this watershed is grazing.

Planning Watershed C04A

Ghost Creek (119)

This reach is on private land (per the landowner's permission). This reach was assessed to serve as a potential "best available" reference for Ghost Creek. Primary management activities in this watershed are grazing, roading and recreation.

Ghost Creek (120)

This reach is approximately one mile upstream of reach 119, in a large meadow. Primary management activities in the watershed are grazing, roading, and recreation.

Ghost Creek (121)

This reach is approximately one-half mile downstream of reach 119, in a small meadow below where the Clarks Fork trail crosses the creek. Primary management activities in the watershed are grazing, roading, and recreation.

Exclosure Creek (122)

This reach is on a tributary of Ghost Creek below an exclosure. Primary management activities in the watershed are grazing and recreation.

Table 15. Greybull District

Reach Name	Reach Number	Class	Cause	Prescription
NF Dick	108	II	2, 4, 5	1, 3, 4
NF Dick	113	II	2, 4, 5	1, 3, 4
NF Dick	114	II	2, 3, 4, 5	1, 3, 4

Planning Watershed G11B

North Fork Dick Creek (108)

This reach is within a long-term exclosure built in 1983. Primary management activities in the watershed are grazing, timber harvest, roading and recreation.

North Fork Dick Creek (113)

This reach is downstream of reach 108, in a temporary exclosure built in 1994. Primary management activities in the watershed are grazing, timber harvest, roading and recreation.

North Fork Dick Creek (114)

This reach is downstream of reaches 108 and 113. It is not in an exclosure. Primary management activities in the watershed are grazing, timber harvest, roading and recreation.

Table 16. Washakie District

Reach Name	Reach Number	Class	Cause	Prescription
Dickinson	133	II	2, 5	1, 3
Sand	134	I		
Cole Spring	115	II	2, 3 ,4 ,5	1, 3, 4
Squaw	116	I		
MF Popo Agie	131	I		
Sawmill	124	II	2, 3, 5	1, 3, 4
Sawmill	127	I		

Table 16. Washakie District (continued)

Reach Name	Reach Number	Class	Cause	Prescription
Crooked	136	II	2, 3, 4, 5	1, 3, 4
Canyon	132	I		
Louis Lake	128	I		
Hidden	137	II	2, 5	1, 3
L Popo Agie	135	I		
Snow	129	I		
Snow	130	I		
Slate	125	II	2, 5	1, 2, 3
Rock	123	II	2, 5	1, 2, 3
Rock	126	I		

Planning Watershed L07G

Dickinson Creek (133)

This reach is directly upstream of the Guard Station at the downstream end of a large meadow complex. Primary management activities are grazing, roading and recreation.

Sand Creek (134)

This reach is near its confluence with the North Fork Popo Agie River, close to the Forest boundary. There are no major management activities near the reach. Dickinson Park (see reach 133) is several miles upstream of this reach.

Planning Watershed L12G

Cole Spring Creek (115)

This reach is below Cole Spring near the Forest boundary. Primary management activities are grazing and roading.

Squaw Creek (116)

This reach is directly upstream of the South Fork Squaw Creek confluence near the Forest boundary. The primary management activity is grazing.

Planning Watershed L14G

Middle Fork Popo Agie (131)

This reach is in Sinks Canyon near the Forest boundary. Primary management activities are recreation and roading.

Planning Watershed L15G

Sawmill Creek (124)

This reach is in a meadow in Sawmill Park. The Loop Road crosses the reach. Primary management activities are grazing, timber harvest, roading and recreation.

Sawmill Creek (127)

This reach is below the Townsend Creek confluence. Primary management activities are grazing, timber harvest, roading and recreation.

Crooked Creek (136)

This reach is below the Elderberry Creek confluence at the Forest boundary. Primary management activities are grazing and roading.

Planning Watershed L18G

Canyon Creek (132)

This reach is below the Spring Creek confluence. Primary management activities are grazing and roading.

Louis Lake Creek (128)

This reach is upstream of Louis Lake. The primary management activity is dispersed recreation.

Hidden Creek (137)

This reach is in Maxon Basin, directly upstream of the Little Popo Agie River confluence. Primary management activities are grazing and roading.

Little Popo Agie (135)

This reach is below the Pass Creek confluence. Primary management activities are grazing, timber harvest, roading and recreation.

Planning Watershed L19G

Snow Creek (129)

This reach is within the Snow Creek exclosure. Primary management activities are grazing and roading.

Snow Creek (130)

This reach is upstream of the Snow Creek exclosure. Primary management activities are grazing and roading.

Planning Watershed L21G

Slate Creek (125)

This reach is downstream of the Loop Road. Primary management activities are grazing (including trailing of domestic sheep), timber harvest (personal use fuelwood), roading and recreation.

Rock Creek (123)

This reach is in Grannier Meadow. Primary management activities are roading and recreation.

Rock Creek (126)

This reach is downstream of Grannier Meadow. Primary management activities are roading and recreation.

Table 17. Wind River District

Reach Name	Reach Number	Class	Cause	Prescription
Bonneville	97	I		
Brooks Lake	98	I		
W Brooks Lake	99	III	2, 3, 4, 5, 6	3, 4, 5
West Dunoir	10	U		
West Dunoir	11	U		
Dunoir	33	U		
Dunoir	34	U		
Dunoir	35	U		
Dunoir	36	U		
Dunoir	37	U		
Frontier	1	I		
Frontier	2	I		
Frontier	13	I		
Frontier	14	I		
Frontier	15	I		
Frontier	16	I		
Frontier	24	I		
Frontier	25	I		
Frontier	26	I		
Frontier	32	I		
Frontier	38	I		
Frontier	39	I		

Table 17. Wind River District (continued)

Reach Name	Reach Number	Class	Cause	Prescription
Wiggins	17	I		
Wiggins	18	I		
Wiggins	19	I		
Wiggins	20	I		
Wiggins	27	I		
Wiggins	28	I		
Wiggins	29	I		
Wiggins	30	I		
Fire	6	I		
Snow Lake	7	I		
Caldwell	12	I		
Castle	5	I		
EF Wind	21	III	2, 3 ,4, 5	1, 3, 4
EF Wind	22	III	2, 3, 4, 5	1,3, 4
EF Wind	109	II	2	1
Alkali	90	I		
Bear	23	II	2, 5	1, 5
Bear	31	II	2, 5	1, 5
Wayne	91	II	2, 5	1, 5
Wiggins	3	I		
Wiggins	4	I		
Cartridge	8	I		
Charlie	89	II	2, 3, 4, 5	1, 3, 4

Table 17. Wind River District (continued)

Reach Name	Reach Number	Class	Cause	Prescription
Parque	41	U		
Burroughs	42	U		
Horse	110	I		
Horse	111	I		
Burroughs	88	I		
Burroughs	139	I		
Parque	41	U		
Parque	140	I		
Little Horse	40	U		
Tappan	138	II	2, 3, 4, 5	1, 3, 4
WF Long	85	III	2, 3, 4, 5	1, 3, 4
WF Long	104	III	2, 3, 4, 5	1, 3, 4
WF Long	141	III	2, 3, 4, 5	1, 3, 4
MF Long	105	II	2, 4, 5	1, 3, 4
MF Long	106	III	2, 3, 4, 5	1, 3, 4
MF Long	142	III	2, 3, 4, 5	1, 3, 4
MF Long	143	III	2, 3, 4, 5	1, 3, 4
EF Long	144	II	2, 3, 4, 5	1, 3, 4
Wind	107	II	2, 3, 4, 5, 6	1, 3, 4
Sheridan	112	I		
Green	86	I		
Trappers	87	II	2, 5	1, 3, 4
SF Warm Spring	92	I		

Table 17. Wind River District (continued)

Reach Name	Reach Number	Class	Cause	Prescription
Camp	93	I		
Trout	94	II	2, 4, 5	1, 3, 4
Fish Lake	95	I		
Coyote	96	I		
Enos	103	I		
Salt	100	I		
Warm Spring	102	I		

Planning Watershed R01E

Bonneville Creek (97)

This reach is near its confluence with Brooks Lake. Primary management activities are timber harvest, roading and recreation.

Brooks Lake Creek (98)

This reach is upstream of Brooks Lake. The primary management activity is recreation.

West Side Brooks Lake Creek (99)

This reach is near its confluence with Brooks Lake. Primary management activities are special use permit horse pasture grazing and recreation use.

Planning Watershed R02E

In 1994, two reaches on West Dunoir (10 and 11) and five reaches on Dunoir Creek (33, 34, 35, 36, and 37), all within the Dunoir Special Management Area, were monitored. Extenuating circumstances, such as loss of part of the seasonal crew to return to college, resulted in incomplete data collection on these reaches. Assessments cannot be completed on these reaches until additional information is collected.

Planning Watershed R06E

In 1994, stream health assessment work was focused on identifying reference conditions. Twelve reaches were established on Frontier Creek (1, 2, 13, 14, 15, 16, 24, 25, 26, 32, 38, and 39) upstream of its confluence with Wiggins Fork. The primary management activity in this watershed is recreation.

Planning Watershed R07E

In 1994, stream health assessment work was focused on identifying reference conditions. Eight reaches were established on Wiggins Fork (17, 18, 19, 20, 27, 28, 29, and 30) upstream of the Frontier Creek confluence. Additionally, one reach on Fire Creek (6) and one reach on Snow Lake Creek (7) was established. The primary management activity in this watershed is recreation, although there is a recent burn in Fire Creek.

Planning Watershed R08E

Caldwell Creek (12)

This reach is near the Wiggins Fork confluence. The primary management activity is grazing.

Planning Watershed R11E

Castle Creek (5)

This reach is near the East Fork Wind River confluence. Primary management activities in the watershed are timber harvest, roading, and recreation.

East Fork Wind River (21 and 22)

These two reaches are near the East Fork Guard Station. The primary management activities in the watershed are roading, timber harvest, and recreation. The riparian area around the reach was used as a horse pasture for the Guard Station. There is also unauthorized livestock use from the nearby Wind River Indian Reservation.

East Fork Wind River(109)

This reach is upstream of reaches 21 and 22. The primary management activity in the watershed is recreation.

Alkali Creek (090)

This reach is near the Forest boundary. The primary management activities in the watershed are roading and recreation.

Planning Watershed R12E

Bear Creek (23 and 31)

These two reaches are directly downstream of Bear Basin. The primary management activities in the watershed are roading and recreation.

Wayne Creek (91)

This reach is near the bottom end of Waynes Hole. The primary management activities in the watershed are roading and recreation. Watershed improvement projects to improve riparian and upland range condition in Waynes Hole took place in the recent past.

Planning Watershed R13E

Wiggins Fork (3 and 4)

These two reaches are on small tributaries of the Wiggins Fork along the Wiggins Fork Road. Primary management activities in their watersheds are timber harvest, roading, grazing and recreation.

Cartridge Creek (8)

This reach is near the Wiggins Fork road. Primary management activities in the watershed are grazing, timber harvest, roading, and recreation.

Charlie Creek (89)

This reach is near the Wiggins Fork confluence. Primary management activities in the watershed are grazing, timber harvest, roading, and recreation.

Planning Watershed R14E

Parque Creek (41) and Burroughs Creek (42)

In 1994, one reach on Parque Creek (41) and one reach on Burroughs Creek (42) was monitored. Extenuating circumstances, such as loss of part of the seasonal crew to return to college, resulted in incomplete data collection on these reaches. An assessment cannot be completed on these reaches until additional information is collected.

Horse Creek (110)

This reach is near the Forest boundary. Primary management activities in the watershed are timber harvest, roading, grazing, and recreation.

Horse Creek (111)

This reach is directly upstream of where FDR 504 crosses Horse Creek. Primary management activities in the watershed are timber harvest, roading, grazing, and recreation.

Burroughs Creek (88)

This reach is directly upstream of the Horse Creek Guard Station. Primary management activities in the watershed are timber harvest, roading, grazing, and recreation.

Burroughs Creek (139)

This reach is in Amoretti Park. The primary management activity in this watershed is grazing.

Parque Creek (41)

This reach is on an unnamed tributary of Parque Creek. Extenuating circumstances, such as loss of part of the seasonal crew to return to college, resulted in incomplete data collection on this reach. An assessment cannot be completed on this reach until additional information is collected.

Parque Creek (140)

This reach is in Ramshorn Basin. Primary management activities are grazing and recreation.

Planning Watershed R15E

Little Horse Creek (40)

This reach is near the Forest boundary. The primary management activity in this watershed is grazing. Extenuating circumstances, such as loss of part of the seasonal crew to return to college, resulted in incomplete data collection on this reach. An assessment cannot be completed on this reach until additional information is collected.

Tappan Creek (138)

This reach is directly upstream of the Forest boundary. Primary management activities in this watershed are timber harvest, roading, and grazing.

Planning Watershed R16E

West Fork Long Creek (85, 104, and 141)

These three reaches are scattered along the entire length of the drainage upstream of the Forest boundary. Primary management activities in the watershed are grazing, timber harvest, roading, and recreation.

Middle Fork Long Creek (105, 106, 142, and 143)

These four reaches are scattered along the entire length of the drainage upstream of the Forest boundary. Primary management activities in the watershed are grazing, timber harvest, roading, and recreation.

East Fork Long Creek (144)

This reach is downstream of the Gap Lake saddle. Primary management activities in the watershed are grazing, timber harvest, roading, and recreation.

Planning Watershed R17E

Wind River (107)

This reach is approximately one mile downstream of the Tiehack Memorial. Primary management activities in the watershed are private land development, timber harvest, roading, grazing and recreation.

Sheridan Creek (112)

This reach is directly upstream of the Wind River confluence. Primary management activities are timber harvest, roading, grazing, and recreation.

Planning Watershed R19E

Green Creek (86)

This reach is near the Warm Springs Creek confluence. Primary management activities in the watershed are timber harvest, roading, grazing, and recreation.

Trappers Creek (87)

This reach is near the Warm Springs Creek confluence. Primary management activities in the watershed are timber harvest, roading, grazing, and recreation.

South Fork Warm Spring Creek (92)

This reach is near the Warm Springs Creek confluence. Primary management activities in the watershed are timber harvest, roading, grazing, and recreation.

Camp Creek (93)

This reach is near the Warm Springs Creek confluence. Primary management activities in the watershed are timber harvest, roading, grazing, and recreation.

Trout Creek (94)

This reach is near the Warm Springs Creek confluence. Primary management activities in the watershed are timber harvest, roading, grazing, and recreation.

Fish Lake Creek (95)

This reach is near the Warm Springs Creek confluence. Primary management activities in the watershed are timber harvest, roading, grazing, and recreation.

Coyote Creek (96)

This reach is near the Warm Springs Creek confluence. Primary management activities in the watershed are timber harvest, roading, grazing, and recreation.

Enos Creek (103)

This reach is near the Warm Springs Creek confluence. Primary management activities in the watershed are timber harvest, roading, grazing, and recreation.

Planning Watershed R20E

Salt Creek (100)

This reach is near the South Fork Warm Springs Creek confluence. The primary management activity in the watershed is grazing.

Planning Watershed R21E

Warm Spring Creek (102)

This reach is upstream of where the Union Pass Road crosses Warm Springs Creek. Primary management activities in the watershed are timber harvest, roading, grazing, and recreation.

Evaluation

Over one hundred individual reaches of stream have been assessed for *physical integrity* since 1994. Fifty-six reaches are in Class I condition, twenty-three are in Class II, and twelve are in Class III. Condition on eleven reaches cannot be fully assessed until additional information is collected. Causative factors resulting in Class II and III conditions have been identified as have recommended corrective actions.

Of concern on most reaches is the delivery of sediment from the transportation network to the stream system. Improving erosion control by disconnecting the transportation system from receiving streams would be beneficial to maintaining or improving physical integrity.

Many reaches are still in a recovery mode from past management. Time is the most appropriate remediation for these reaches. There are some reaches where recovery may be accelerated through land treatment measures. These possibilities need to be pursued.

Some reaches are being negatively impacted by ungulate use. Better enforcement of permits and proper management of big game numbers would be beneficial for correcting these situations.

Project Level Monitoring

Watershed Improvement

Forty-seven culverts were installed on the Wiggins Fork Road (FDR 285) in 1995 to reduce the amount of sediment entering streams along the road. These culverts were reviewed in 1996. Most are working as intended, a few seem to be placed wrong so are not catching as much water and sediment as intended, and a few were not installed at the best angle to function as intended. Most, approximately 80 percent, are working well and are diverting significant amounts of water and sediment from road runoff away from waters of the U.S. Options for correcting the 20 percent are being pursued.

Numerous miles of road were obliterated in 1995 to improve watershed condition. A majority of this work was reviewed in 1996. On all but two of the roads, the obliteration has effectively closed the road from all vehicle traffic. About 100 yards of one road and about 0.7 miles of another were very difficult to barricade and have been used by vehicles. All water diversion structures constructed are 90 percent effective. The roads should recover and return to productive sites over the next few years. Overall the road obliteration effort has been very successful. Options for correcting the two ineffective closures are being pursued.

While conducting the above reviews, gullying near MP 4.4 of FDR 285, was noted. The gully is 6 to 8 feet deep. It may be related to grazing. Sediment is not reaching any streams, but soil productivity is being affected. Options for correcting this situation are being pursued.

North Fork Highway Reconstruction

Reconstruction of the Cody to Yellowstone Highway began in the spring of 1996. Considerable monitoring of the reconstruction effort took place between project start-up and September 30. This monitoring focused on compliance with Forest Plan standards and guidelines, the Corps of Engineers 404 permit, the Wyoming Department of Environmental Quality (WyDEQ) Pollution Prevention Plan and WyDEQ water quality standards. Monitoring was conducted individually by a hydrologist or in concert with other Forest and agency personnel. Many compliance concerns were identified and subsequently corrected. Others are being corrected. Because of the proximity of this project to the North Fork Shoshone River, monitoring will remain a high priority in 1997.

Bald Mountain Revegetation Research

Bald Mountain is located within the Kirwin Mining District on the Greybull Ranger District. This area received some mining activity near the turn of the century but was subsequently abandoned until the early 1960's. American Metals Climax Corporation (AMAX) then purchased the land to explore the mineral potential of Bald Mountain. An extensive road network was established throughout the mountain for exploratory drilling, of which approximately 50 percent is in the alpine. This property was donated to the Forest Service in 1993. Concerns exist with the revegetation taking place on the alpine road system. Todd Caplan, a graduate student from the University of Montana, conducted a vegetation study on Bald Mountain and completed his thesis in 1996. His thesis provides the Forest important native species revegetation information should the Forest decide to pursue rehabilitation of Bald Mountain. Information on his work may be found in Caplan, T.R. 1996. Final Report: Restoring Alpine Tundra Following Road Disturbances On Bald Mountain, Wyoming: An Ecological Approach To Species Selection, University of Montana, Department of Resource Conservation, School of Forestry.

Dano Fire Burned Area Evaluation Report

The Dano Fire was started by lightning in August of 1996. A hydrologist was dispatched to the burn area to assess emergency watershed rehabilitation needs. After considerable aerial and ground reconnaissance a determination was made that no watershed emergency existed; thus, no emergency treatments would be implemented. Normal suppression related watershed rehabilitation did occur however. This included drainage on fire line and access roads and re-seeding of suppression disturbed areas, mostly dozer lines. A review of the rehabilitation will occur in 1997 to determine the success of the effort.

Clover-Mist Wildfire Recovery

Monitoring of the effects of the Clover-Mist Wildfire of 1988 continued in 1996. The monitoring indicates vegetative recovery, mostly in the form of grasses and forbs is proceeding, albeit quite slowly in some areas, particularly on volcanic soils. Regeneration of conifers is particularly slow. An increasing number of mass movements are occurring, primarily because root masses are deteriorating. Most of the movements are occurring in areas not being actively managed. Actively managed areas are receiving close scrutiny by watershed specialists before activities proceed. This scrutiny will occur in these areas for many years to come.

Deep Lake Flooding

Snowmelt in 1996 was unusually high. Deep Lake, a natural landslide generated lake located on the Clarks Fork District, reached levels not seen in many years. Downstream property owners expressed

concern during the snowmelt season that the natural dam may be breaching, which could cause considerable flooding. The dam and lake were assessed from the air and at a later date by personnel from the United States Geological Survey. No evidence of potential failure was found.

North Fork Winter Range Utilization

Portions of the Sweetwater and Horse Creek drainages, both tributaries to the North Fork Shoshone River and both within big game winter range, were reviewed by a hydrologist during the spring of 1996. Evidence that overutilization of vegetation by big game, particularly elk, is occurring and creating watershed condition and stream health concerns. Upland condition is poor in some areas as evidenced by lack of ground cover, trailing, and pedestal development. Riparian and stream health is less than adequate as evidenced by trampled banks and heavy utilization of riparian vegetation. Monitoring of this activity will continue in 1997.

Chief Joseph Highway Reconstruction

Reconstruction of the Chief Joseph Highway was completed in 1996. A review of erosion control work throughout 1996 indicated revegetation of disturbed areas is occurring at an acceptable rate across much of the project. A few areas of concern were identified and the Wyoming Department of Transportation is reworking these areas in an effort to accelerate recovery. These areas will continue to be monitored in 1997.

Squaw Creek Flooding

A private property owner along Squaw Creek on the Clarks Fork District experienced considerable stream bank erosion and property loss due to the high runoff in the spring of 1996. The fact Squaw Creek was also burned by the 1998 Clover-Mist Fire is another contributing factor. The property owner expressed a desire to conduct stream bank stabilization work on National Forest land directly upstream of the property. This proposal was reviewed by a hydrologist and a determination was made, at least for the time being, that all bank stabilization work could be contained to private land and no work was necessary on National Forest, other than collection of a few boulders from an up slope location.

Bald Mountain Allotment

A cursory review of livestock use in the upper Dry Fork Paint Creek watershed, which is part of the Bald Ridge Allotment, was conducted by a hydrologist. Riparian condition and stream health concerns were identified. This concern was expressed to the District range staff. Options for addressing the concern are being pursued.

Basin Allotment

A cursory review of ungulate use in the Painter Gulch and Russell Creek areas of the Basin Allotment was conducted. Riparian condition and stream health concerns were identified. Options for addressing the concerns are being identified.

Wapiti Ranger Station Flooding

Stream banks near the Wapiti Ranger Station encountered considerable erosion during the 1996 runoff season. These areas were reviewed to determine if stream bank stabilization projects are

worth pursuing. The potential for projects is continuing. In the interim, certain facilities at the Ranger Station were relocated away from the river.

Evaluation

Project level monitoring is an important part of the Forest watershed management program. It is useful for assessing implementation and effectiveness of mitigation measures, compliance with standards, and general trend. This type of monitoring should remain a priority.

2. Water Uses

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

The Forest water use inventory electronic database no longer exists as it was inadvertently deleted from the agency computer in Fort Collins, Colorado. Efforts to reconstruct the database continue to be pursued by the Regional Office. In the interim, a hard copy database is utilized.

Evaluation

The Forest acquired one new water right for livestock use in 1996. The name of the use is East Rock Creek. It is a spring development with a tank for 5 gallons per minute located in the SW1/4, SW1/4, Section 27, T50N, R104W.

No new water related Special Use Permits were issued in 1996.

LANDS

1. Land Exchange Offers

The planning period target for land exchange for 1991-2000 is 0 acres. This figure represents the relative lack of need or opportunity for land exchange which is a function of the Shoshone National Forest's favorable land pattern.

In 1996 the Forest finalized the South Fork Exchange. Benefits of this exchange included consolidation of land ownership and acquisition of habitat for Bighorn Sheep. A trespass case was also resolved via this exchange and several special use permits eliminated. A total of 171.26 acres of non-federal land was acquired for 156.93 acres of federal land.

Evaluation

Although opportunities are limited for land exchange on the Shoshone, the Forest does pursue cases that are in the public interest. Proposals received with limited or no value to the public are rejected.

2. Right of Way Acquisition

The Shoshone Forest Plan proposed completion of 2 rights-of-way cases each year in the 1991-2000 planning period. Achievement of this target has become increasingly difficult as landowners become more and more reluctant to convey rights-of way. This is evident in the fact that the Forest did not acquire any rights-of-way in 1996. Most landowners are now willing to convey easements only in those cases by which they can acquire something of benefit to them in exchange. In 1996 the Forest began negotiations with the TE Ranch for an exchange though which access to the Table Mountain area of the Forest would be gained through acquisition of a right-of-way on the West Fork Twin Creek trail. Forest lands selected by the TE Ranch consist of land adjacent to the ranch which are currently under special use permit for hay production.

Evaluation

Right-of-way acquisition will continue to become more difficult and more expensive. Creative methods of acquiring access to the forest will need to utilized in order to successfully acquire access.

3. Land Line Location (Property Boundary Location) and Occupancy Trespass

Land line location on the Shoshone National Forest for the past several years has been conducted specifically as project support and in response to occupancy trespass only. In 1996 the Forest did not complete any land line location work, but did investigate a possible boundary dispute on the Wind River Ranger District. Preliminary investigations were inconclusive and more work is planned in 1997 in order to resolve this situation.

Evaluation

Although the Forest has had a limited land line program in recent years, funding to the Forest is expected to increase significantly in 1998 and beyond based on the new budget allocation process. Initial funding will be utilized to complete high priority work on the Wind River Ranger District where significant development adjacent to the forest is occurring. Expanding the land line program will aid

the public by clearly identifying forest boundaries and save the Forest administrative expenses in trespass/encroachment resolution.

4. Compliance with Land Use Authorizations (Special Uses) and Consistency with the Plan

The Special Uses workload continued to grow in 1996 as numbers of permits increased while the issues associated with permit administration grew more complex. In 1996 the forest converted over 50% of the developed recreation facilities to concessionaire operated facilities. These facilities were offered in three separate prospectuses: the North Fork Corridor, the Beartooth Corridor, and the Wind River Corridor. Rocky Mountain Recreation was selected to operate all three corridors. The Shoshone National Forest's organizational structure for administration of these three permits consisted of two forest-wide program managers and three permit administrators.

The 1996 monitoring plan for special uses was designed to focus on those permits which are at the highest risk for potential health and safety concerns and/or potential for resource degradation. These permits are the concessionaire permits through which services are provided to the public for camping, outfitter/guide services, skiing, recreation events and lodge/resorts. All permits within these categories were monitored in 1996. A summary of permits by type is attached.

Evaluation

Monitoring of the administrative aspects of high risk permits is accomplished via a series of charts. These charts are used to track receipt of updated operating plans, insurance policies and fees by date due. Items which are late are followed up on immediately through telephone and written correspondence.

On the ground monitoring consisted of weekly site visits at a minimum for compliance with food storage regulations at lodges, campgrounds, organization camps and recreation residences. The downhill ski area was monitored for safety items on a weekly basis. In depth evaluations of operations were conducted at the beginning, middle and end of the season for campgrounds and at the end of the operating season for resort and outfitter/guide permits. Items to be corrected were noted with time frames to correct. Documentation of these evaluations is contained within each permit folder as well as on permittee performance ratings.

In order to ensure fair market value is received for permitted activities on National Forest lands, the process of appraising recreation residence sites was begun on the Shoshone. Public meetings for permittees were held and site inspections were conducted. Implementation of the revised fees is scheduled for 2000, following the completion of staff and permittee review, the initial appraisal and any subsequent appraisals allowed for under the current policy.

Demand for permits for commercial film activities increased greatly in 1996. In order to meet this demand within the industry's time frames, collection agreements with the applicants were used to fund forest personnel to monitor permit operations. Permits were processed cooperatively with adjoining forests to reduce processing times and costs. Coordination meetings with film industry representatives, state film office representatives and State and other Federal agencies were held to streamline the permitting process and incorporate guidelines to ensure resource protection.

Efforts were increased in 1996 to provide information to permittees on important Forest issues such as living in grizzly bear country, proper backcountry camp management, and the status of backcountry trails which were damaged by heavy spring run-off. Letters on these issues were mailed to outfitter/guide permittees. Weekly talks were conducted at the Boy Scout Camp Organizational to

educate campers about the Shoshone National Forest and to convey information on camping in bear country. Presentations on Forest issues were also made to Forest users at lodges located adjacent to the Shoshone National Forest.

Collaborative efforts with the Wyoming State Board of Outfitters, the Wyoming Game & Fish Department, the US Fish and Wildlife Service, and the Bureau of Land Management were utilized to pursue resolution of illegal Outfitter/Guide activities.

Table 18. 1996 Special Use Permits. Number and Type on South Zone. South Zone = Washakie and Wind River Districts.

Number	Type of Permit
2	Organization Camp
5	Lodge/Resort
29	Recreation Residence
4	Recreation Event
87	Outfitter Guide
13	Agricultural
10	Road Easements/Permits
25	Communications Permits
16	Water conveyance
12	Miscellaneous
1	Campground
14	Mineral Material

Table 19. 1996 Special Use Permits. Number and Type on North Zone. North Zone = Wapiti, Clarks Fork and Greybull Districts.

Number	Type of Permit
1	Organization Camp
14	Lodge Resort
4	Ski area/activity
71	Recreation Residence
0	Recreation Event
45	Outfitter Guide
8	Agricultural
24	Road Easements/Permits
13	Communications Permits
66	Water conveyance
17	Miscellaneous
2	Campground
5	Mineral Material
23	Commercial Film

FOREST TOTAL: 507 Permits/Easements

5. Occupancy Trespass

In 1996 the Forest resolved one case of occupancy trespass through completion of the South Fork Land Exchange.

Evaluation

Occupancy trespass cases are acted upon when discovered. It is expected that discovery of occupancy trespass will increase in the future when the Forest expands its land line program.

FACILITIES

Forest Plan Monitoring Requirements for facilities were modified in the Allowable Sale Quantity amendment in 1994 (Allowable Sale Quantity Record of Decision, August 1994). The following incorporates the new monitoring requirements.

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

This monitoring requirement allows a 25% deviation from the planned accomplishment for road construction and reconstruction. The following are Forest Plan projections for collector and local road construction and reconstruction:

Table 20. Projected Road Construction/Reconstruction 1991-2000

Miles	Collector	Local
Road Construction	2.0	5.6
Road Reconstruction	1.7	1.9

In FY 1996, 1 mile of new local road was constructed and 4.5 miles of local road were reconstructed. No miles of arterial or collector road were constructed or reconstructed. Comparing to the projected average annual production, this is 18% of the average annual for new local road construction and 237% of the average annual for local road reconstruction.

During FY 1996, eight more miles of road were obliterated than were newly constructed, bringing the net five year mileage of new construction versus obliteration to -44.0 miles (44 more miles obliterated than newly constructed during the most recent 5-year period). See Road Obliteration, below.

Evaluation

Deviations from Forest Plan projections have occurred for various reasons and several years. FY96 was no exception. The failure of the Forest to reach +-25% of the projection is not considered serious and additional evaluation as to the reason is not necessary. The road construction/ reconstruction program for the Shoshone is entirely dependent on the timber and road capital investment programs. Roading for support of the timber program is kept to an absolute minimum necessary to harvest the timber and protect the surrounding resources. The road capital investment program has recently focused on recreation improvements rather than road construction or reconstruction. There has been no demonstrated public demand or need for new roading. Refer to the Trend Analysis section on Road construction/reconstruction for additional information.

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

This item was added to the monitoring requirements in the Forest Plan amendment to monitor the "no net increase in roads" policy (Allowable Sale Quantity, Record of Decision, August 1994). This direction has been implemented on the Forest. Roads that were constructed for short term uses, such as timber sales, have been subsequently closed or obliterated.

Three miles of road were closed in FY 1996. These roads were all local roads associated with timber sales. All three miles are existing roads which were reconstructed by timber sale activities and which will be

closed when sale activities are completed. At the end of FY 1996, there was an inventoried total of 298 miles of closed road on the Shoshone Forest. The one mile of new road construction shown above was not one of the miles closed.

Evaluation

Table III-1 in the Forest Plan shows that there should be 99 miles of closed road on the Shoshone each year. The inventoried number of closed miles, above, would indicate that the Forest is at 301% of its average annual accomplishment. This could indicate several things, but most likely indicates that the Forest needs to look at its closed roads to see if some are candidates for obliteration. Normally a closed road is a road which is not needed for several years for management purposes, but is needed sometime within a 20-yr period of time, beginning when it is constructed. It is recommended that this be assessed during plan revision and the need for the existing closed roads be examined.

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

This item was also added to the monitoring requirements in 1994 to monitor the "no net increase in roads" policy and goes hand-in-hand with the previous item. Miles of new Forest development road are measured against road miles obliterated so that for each five year period, beginning October 1, 1994, the number of miles of new Forest Development road construction does not exceed the number of miles of road obliteration, forestwide. A road is obliterated when its functionality is eliminated by reclamation/restoration and it is returned to resource production. The road ceases to exist and is removed from the Forest Development Transportation System.

Nine miles of road were obliterated in FY 1996. Two of these miles were inventoried Forest Development Roads and the other seven were inventoried, but not "system" miles. The road obliteration was part of the watershed improvement program. Forest Plan projections for road obliteration are 7.6 miles per year. The FY 1996 accomplishment was 118% of the projected. This item has a monitoring limit of +-15%.

Evaluation

Not being within the 15% allowance for road obliteration is not a factor of concern at this time. The watershed cumulative effects analysis and inspections are finding hundreds of miles of existing road which are not on the transportation system and which may not be necessary for proper national forest management. As the inventory of roads progresses, many more miles of possibly unnecessary roads will be discovered. Many of these will be candidates for obliteration as funding becomes available. It is likely that the +- figure will be exceeded in subsequent years. It is recommended that the disposition of these many miles of "unofficial" roads be analyzed as part of the Forest Plan revision.

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

This monitoring item was amended into the Forest Plan in 1994 (effective on October 1, 1994). Level 1 roads, by definition, are closed roads. Level 1 maintenance work includes regular visual inspection of drainages and erosion control and correction of deficiencies. The 1994 amendment added a requirement that effectiveness of the closure also be inspected and deficiencies corrected.

Level 1 maintenance was performed on 27.3 miles of inventoried system roads in FY 1996. This amounts to 9% of the total number of Level 1 miles. No deficiencies in the closures on these roads were reported.

The Forest Plan (Table III-1) set an average annual output for level 1 road maintenance at 332 miles. The actual miles maintained were 8% of this total, missing the +- 25% mark.

Evaluation

Level 1 road maintenance is the least expensive level of maintenance, but is the most labor-intensive. In FY 1996, priority was given to arterial and collector roads and to correct safety deficiencies on bridges. The Forest has developed a guideline in which Level 1 maintenance will be performed once every four years on Level 1 roads. The number of miles of Level 1 will change over the years as roads are added or deleted from the transportation system inventory. This new guideline will be fulling implemented in FY 1997. It is recommended that the new guideline of 25% of the Level 1 roads be maintained each year be included in the analysis and subsequent new output/monitoring guidelines during Forest Plan revision. It is virtually impossible to perform Level 1 maintenance on every mile of Level 1 road every year, as suggested in the present Forest Plan.

PROTECTION

Forest Insects and Disease

The Rocky Mountain Region's Forest Health Management department in Rapid City, South Dakota (Rapid City Service Center) coordinates and conducts monitoring for insects and disease on the Shoshone National Forest. Destructive forest insects and diseases are monitored following management activities, and through other methods such as aerial surveys.

An aerial survey of pest conditions was conducted on the Shoshone National Forest on July 22-26, 1996. This survey was done to estimate damage levels caused by a number of forest insects and diseases, including comandra blister rust, dwarf mistletoe, bark beetles, and other damage agents.

Widespread damage was detected on the Forest from dwarf mistletoe and comandra blister rust. Over 100,000 acres of national forest land were categorized as being in the heavy damage class. Areas affected by these agents were found on all parts of the forest, but the majority of heavy damage was located on the Wind River and Washakie Ranger Districts.

Sketch mapping indicated that there were 277 trees killed by mountain pine beetle on 467 acres on the Shoshone National Forest and surrounding lands in 1996. This includes attacks on lodgepole, ponderosa, whitebark and limber pines. Douglas-fir beetle killed 1075 trees on 1271 acres on the Forest and surrounding areas in 1996.

Detection surveys were conducted for the gypsy moth, an exotic insect, at 14 recreation or administrative sites on the Shoshone National Forest. In addition, 26 traps were placed in and around Falls Campground on the Wind River District in the vicinity of Togwotee Pass, as a delimitation survey for gypsy moth in response to a positive catch at this campground in 1995. No moths were caught in the traps located on the Forest. However a single moth was caught in Jackson, Cody and Sheridan along with 12 moths caught at an Air Force base in Cheyenne in 1996.

Permanent plots for studying comandra blister rust were revisited in 1996. The plots are being used to determine the effects the rust is having on stand structure and tree mortality over time. It is hoped that this study may lead to some management alternatives that can minimize the impact of this disease in the future.

Also, a general detection survey was conducted to look for white pine blister rust in whitebark and limber pine stands on the Forest. White pine blister rust is an introduced disease causing mortality in western white, whitebark and limber pine stands in the west. This disease was found in at least some stands on the Forest, with the heaviest infection levels and damage on the northern end of the forest.

Evaluation

The level of Douglas-fir beetle was the lowest it has been in the last 6 or 7 years since the outbreak started after the 1988 Clover Mist fire. There were 111,332 acres mapped as being moderately to heavily infected with dwarf mistletoe or a combination of dwarf mistletoe and comandra blister rust, mostly in lodgepole pine type. Finally, there were 12,549 trees killed on 7338 acres attributed to subalpine fir decline. This decline is thought to be caused by a number of factors including the western balsam bark beetle, root and stem diseases, and possibly other factors.

Evaluation of the outbreak of Douglas-fir beetle in the Clarks Fork and Sunlight areas, Clarks Fork District, was continued in 1996. This area has had high levels of beetle activity since 1989, a year

after the Clover Mist fire burned onto the Forest. It appears the outbreak may finally be subsiding possibly due to treatment of infected trees and a reduction in suitable host trees. Monitoring will continue.

No confirmed established populations of the gypsy moth have been detected on the Forest at this point, but the need for continued trapping is essential for identifying possible introductions in the future.

AIR RESOURCE

Effects of Other Resource Management on Air Quality and Air Related Values

Air Quality on the Shoshone National Forest is monitored on the south end of the Forest for two wilderness areas located in the Wind River Mountains, the Fitzpatrick and Popo Agie. The Shoshone and Bridger-Teton Forests have developed a long-term monitoring program in the Wind River mountains because of the extreme sensitivity of a large percentage of the lakes and many air pollution sources from the southwestern part of Wyoming such as existing and developing natural gas fields, coal-fired power plants, phosphate fertilizer plants, and trona mines.

The Bridger-Teton National Forest has been the lead in developing a long-term air quality monitoring program in the Wind River Mountains and the Shoshone is an integral part of that program. There are two parts to the that program. Air Quality Related Values (AQRV) monitoring consists of yearly sampling of two wilderness lakes for a number of chemical and biological parameters. The second part is the National Atmospheric Deposition Program (NADP) site and involves collecting weekly samples from a wet and dry deposition collector located at South Pass on the Washakie Ranger District.

In 1996 additional sampling was conducted, also coordinated with the Bridger-Teton National Forest. In cooperation with the National Outdoor Leadership School (NOLS) a synoptic survey was conducted on six high elevation wilderness lakes on the Shoshone as well as on several lakes on the Bridger-Teton. The synoptic survey consists of a one time water sample from the lake or the outlet to determine some baseline lake chemistry. Lakes sampled were selected for high potential to have low alkalinity. Low alkalinity lakes are the most sensitive to acidification and those lakes need to be identified for analysis of new pollution sources. NOLS planned to sample several more lakes but due to logistics and early snows sampling was hampered and fewer lakes were sampled than planned.

On the Shoshone National Forest, Lower Saddlebag Lake in the Popo Agie Wilderness and Ross Lake in the Fitzpatrick Wilderness are designated for long-term monitoring. These lakes are sampled regularly for trends and changes in lake chemistry and biology. Samples of macroinvertebrates and zooplankton are also taken as indicators of water quality. Because certain species of these organisms are very sensitive to chemical changes in water, species composition provides valuable information.

On the Bridger-Teton and the Shoshone National Forests this program is largely funded by cooperating industries and provides indicators of national air quality trends. The Shoshone National Forest has two NADP sites on the Washakie District. One is located at South Pass and is administered by the Forest. The other, located in Sinks Canyon south of Lander, is administered and funded by the Bureau of Land Management. Many chemical parameters are measured including pH and conductivity.

Evaluation

In July 1993, the Rocky Mountain Region (Region 2) of the Forest Service completed an air resources management plan titled **Managing Air Resources in the Rocky Mountain Region.** As defined in the plan the Shoshone is part of the Greater Yellowstone Airshed along with the Bridger-Teton and a portion of the Targhee National Forest.

Analysis of the data collected in the AQRV lake monitoring and the NADP program is documented in a report written by Jill Baron of the National Biological Survey at the Natural Resource Ecology Laboratory at Colorado State University. The report, dated December 1994, documents and inter-

prets data collected from 1984 to 1993. Some summary statements from the report are paraphrased as follows:

The Wind River Lakes represent the most sensitive lakes in the Western United States because their low base cation and acid neutralizing capacity (ANC) concentrations make them extremely sensitive to changes from environmental disturbance. Therefore, continuation of this long term monitoring program is necessary to detect future anthropogenic impacts. The baseline monitoring program has enabled us to detect trends and define the limits of natural variability in the chemical characteristics of the Wind River Lakes between 1984 and 1993. Preliminary findings suggest a trend for pH and ANC decreasing over time, with nitrates and sulfates (acid precursors) increasing over time. In other words, a change in water quality. Additional monitoring and analysis over a period of several years is needed.

The report makes several recommendations that are appropriate to point out:

1) continuation of the baseline sampling using the current laboratory (a change of labs occurred in 1990) until 1999, in order to be able to use the full period of record with appropriate statistical techniques for determining magnitude and direction of trends;

2) the monitoring program could be modified to sample the lakes at one location instead of three, preferably at the outlet since the lake locations are not significantly different;

3) if the number of lakes needs to be reduced because of budget constraints, Ross Lake in the Fitzpatrick Wilderness should be eliminated;

4) if more reductions are needed, the number of samples taken at each lake could be reduced to once per year. Based on this report and budgetary factors, less samples were taken at each lake in 1995.

The Clean Air Act contains provisions for Prevention of Significant Deterioration (PSD) of air quality in national wilderness areas. Before certain new air pollution sources are allowed to construct, they must apply for and receive a PSD permit from the appropriate air regulatory agency, in this case the State of Wyoming. The Forest Service carries out its responsibility under PSD by making recommendations to the State on permitting of new air pollution sources, whether or not permits are issued, and what modifications they may need. Collection of this monitoring data is resulting in a database upon which the Forest Service can base recommendations. The Bridger-Teton National Forest has recently developed a Model of Acidification of Groundwater In Catchments (MAGIC), a computer model using data from both Forests. MAGIC will be used to analyze potential new air pollution sources and will help provide recommendations to the State on permit applications.

Results for NADP and AQRV samples collected in FY96 have not yet been analyzed. NOLS and the Washakie District sampled the following lakes using the Rocky Mountain Region synoptic survey protocol: Double Lake, Upper Ross Lake, Goat Lake, Windy Lake, Upper Saddlebag, and Atlantic Lake. Preliminary data identifies Upper Ross Lake as having very low alkalinity meaning it is likely to be very sensitive to chemical change. Other lakes also have low alkalinity, but all the data has not yet been received from the lab.

INTERDISCIPLINARY TEAM CONCLUSIONS AND RECOMMENDATIONS

The intent of the Forest Plan is to emphasize the non-commodity resources (recreation, visuals, wildlife, and water quality) while producing commodities at levels allowed by the Forest Plan. In the 1995 report, the Interdisciplinary Team's conclusions stated that the Forest Plan is still valid. There have been three major Forest-wide analyses in the last five years with two of them resulting in amendments to the Forest Plan. This coupled with six additional amendments have kept the Plan relatively current. Although there are shortfalls between budgets predicted in the Forest Plan and actual budgets, an amendment was not deemed necessary, especially given the impending Forest Plan revision.

Fiscal Year 1996 monitoring resulted in the same conclusions. Changes to the monitoring chapter of the Forest Plan are also recommended and will be addressed during the Forest Plan Revision. These changes include more of an ecosystem approach to monitoring as well as revisiting the monitoring items themselves.

The monitoring chapter of the Forest Plan, however, is in the process of being amended in response to item 18 of the Order of Dismissal of lawsuit no. USDC-WY-96-CV-010-D, WYO Outdoor Council, et.al., v. Elliott, et.al. Though the settlement only required the Forest to address the "variable" monitoring frequency, we are taking the opportunity to make a few other minor changes that reflect updated or new data sources and techniques or that clarify a particular item. None of these changes will result in a change on the ground. More substantial changes will be considered during the Forest Plan revision.

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APPENDIX A

TREND ANALYSES

INTRODUCTION

This trend analysis section was prepared in response to item 13 of the Order of Dismissal of lawsuit No. USDC-WY-96-CV-010-D, Wyo. Outdoor Council, et.al. v. Elliott, et.al. The parties agreed that, to the extent feasible, the Forest Service would prepare trend analyses based on data from 1989 to 1996 for the following 14 Forest Plan monitoring items:

> grizzly habitat effectiveness, wildlife habitat diversity, cavity dependent species habitat, population and habitat trends of management indicator species, road construction/reconstruction, off-road vehicle use of designated travelways, roads closed, roads obliterated, riparian condition rating, water quality, restocking of clearcuts, wilderness use, wilderness campsite condition and dispersed campsite condition.

These trend analyses are to be included in the 1996 Monitoring and Evaluation Report. The agreement specified the 1989-96 time period, and available data for that time period has been examined. For some items data was not available for all the years in that time period hence, trends are based on the best available data. In some instances additional information back to and including 1985 has also been included to add additional perspective.

It was left to the discretion of the Forest Service to decide "what type of trend analysis is sufficient for each element based on existing data at the time the Settlement Agreement is approved". This section fulfills that requirement.

THREATENED SPECIES TRENDS

Grizzly Bear Habitat Effectiveness

Much of the Shoshone National Forest is important habitat for grizzly bears. Good grizzly habitat includes a mosaic of vegetation types providing preferred foods and cover and areas relatively free of human disturbance. Grizzlies prefer low elevation sites in spring that provide an abundance of grasses, forbs and winter killed ungulate carcasses. They generally prefer nonforested sites in summer. Areas of higher elevation whitebark pine trees surrounded by nonforested habitats are preferred during the fall season. Most areas of the Forest receive use by grizzly bears with the exception of the Washakie District.

Efforts to quantitatively assess habitat effectiveness for grizzly bears have been underway in the Greater Yellowstone Area (GYA) for the last decade. Several approaches have been developed, including the grizzly bear Cumulative Effects Model (CEM) and the Interagency Grizzly Bear Committee (IGBC) Access Management Process. The following discussion will focus on CEM as the access analysis is not yet completed for the GYA nor the Forest. Access standards (Road density and core areas) will be developed for the GYA as part of the Conservation Strategy process underway through IGBC. This will provide an additional tool in future years to monitor grizzly bear habitat effectiveness.

CEM produces quantitative output that describes the relative condition of grizzly bear habitat. This output reflects the abundance and quality of bear foods in an area as well as the degree to which grizzly bear access to these resources has been impaired by presence of humans. This combination of inherent habitat capability or habitat value (HV) and its impairment by humans is called habitat effectiveness (HE) . As currently programmed, CEM habitat effectiveness reflects the total or cumulative impacts of all human facilities and activities in an area.

The CEM uses a geographic information system (GIS) and software (ICE9) to manage information and calculate parameters with explicit reference to spatial location and key habitat features. The CEM also incorporates information into its calculations on the type, intensity, and duration of each spatially-referenced human activity.

CEM outputs are summarized by Bear Management Unit (BMU) and subunit within the recovery area. BMUs were delineated in order to divide the recovery area into smaller units defined by biologically meaningful features that have known significance to bears. BMU's are used primarily to monitor and report grizzly bear population information. Subunits, subdivisions of BMU's, were developed to provide further landscape resolution and finer attunement to grizzly bear habitat use patterns. Subunits are the optimal scale for evaluation of grizzly bear habitat parameters.

There are 18 BMU's and 40 subunits in the Yellowstone Grizzly Bear Recovery Area. Three of these BMU's are entirely on the Shoshone National Forest (Crandall/Sunlight, Shoshone, South Absaroka). The remainder of the recovery area on the Forest is encompassed by a small portion of subunit 1 of the Lamar BMU, most of which is within Yellowstone National Park and some on the Gallatin National Forest.

As of December 1996 databases were completed allowing for 14 of the 18 Bear Management Units (BMU's), 31 of 40 subunits, to be evaluated using CEM. All BMU's and subunits on the Shoshone National Forest were evaluated in September of 1996. The remainder of the BMU's in the recovery area will be run through CEM by September, 1997.

It is important to note that CEM outputs represent a quantification of documented bear habits and requirements, and do not constitute an evaluation per se. Additional steps and interpretations are required to perform the analysis. Efforts are underway through the IGBC to test, confirm and interpret model outputs,

as such results are preliminary. At this time it is difficult to say exactly what these outputs mean to the grizzly bear until further evaluation at the recovery area level is completed. All 40 subunits must be evaluated through CEM before testing can be completed.

CEM outputs are HV, HE and percent change from HV to HE for each of three seasons (Spring = March 1-May 31; Summer = June 1-August 31; Fall = September 1-November 30) and an annual average. The denning period is not evaluated. In a general sense, the higher the habitat value (HV) and the habitat effectiveness (HE) the greater the value to the bear. However, it is yet unknown as to what levels of HV, HE and percent change are acceptable to the bear.

Habitat value can only be modified through changes in vegetation or availability of supplemental foods like ungulates, spawning fish and moth aggregations. Man induced changes, other than fire and timber harvest, have little impact on HV. HV is mostly the inherent capability of the land to support grizzly bears. HE values, on the other hand, are directly influenced by human activities. Per cent change outputs provide a measure of the effects to existing habitat capability from human activities. However, the per cent change needs to be evaluated as it relates to the magnitude of the habitat capability or habitat value of the subunit. A ten percent change in a subunit that has an HV of .3 likely requires a different interpretation than a ten percent change in a subunit with an HV of 1.5. The low value subunit may not even be capable of supporting a bear whereas the high value subunit may receive use by numerous bears. Again we do not know what the magnitude of the various outputs truly mean to the bear at this time.

The outputs presented below in table 1 for the subunits on the Shoshone National Forest are considered preliminary and serve the purpose of establishing a baseline for long term monitoring. The intent is to run the model yearly to monitor changes in HV, HE and per cent change. The goal is maintain or improve habitat conditions for the bear.

Table 1. Grizzly Bear Cumulative Effects Model outputs for bear management subunits on the Shoshone National Forest, 1996.

SUBUNIT	MEAN AN HV	MEAN AN HE	% CNG	SPR HV	SPR HE	% CNG	SUM HV	SUM HE	% CNG	FALL HV	FALL HE	% CNG
CRANDALL/SUNLIGHT #1	1.35	1.01	24.9	.21	.17	19.9	1.56	1.14	27.0	2.28	1.73	23.9
CRANDALL/SUNLIGHT #2	1.03	.76	26.0	1.03	.67	35.5	1.14	.86	24.3	.91	.75	17.1
CRANDALL/SUNLIGHT #3	.92	.68	25.8	1.04	.75	28.2	1.15	.82	28.6	.56	.48	15.1
LAMAR #1	1.44	1.24	13.8	1.22	.99	17.5	1.44	1.24	13.9	1.67	1.50	10.4
SHOSHONE #1	.56	.53	5.8	.54	.51	5.2	.66	.61	7.6	.48	.46	4.1
SHOSHONE #2	1.01	.98	3.4	.47	.44	5.7	1.89	1.83	2.9	.68	.66	2.9
SHOSHONE #3	.80	.77	4.5	.43	.41	4.7	1.06	1.00	5.7	.92	.89	3.1
SHOSHONE #4	.59	.52	12.5	.30	.23	23.7	.78	.66	15.3	.70	.67	4.5
SOUTH ABSAROKA #1	.81	.78	3.7	.84	.83	1.9	.93	.88	4.9	.67	.64	4.5
SOUTH ABSAROKA #2	.57	.54	5.4	.67	.66	0.4	.69	.63	8.7	.34	.31	8.0
SOUTH ABSAROKA #3	.71	.65	8.3	.17	.17	3.2	.90	.82	8.8	1.07	.98	8.6

An indirect measure of habitat effectiveness is population response as measured by the population parameters identified in the Grizzly Bear Recovery Plan. Targets for each of these parameters are set in

the Recovery Plan that identify levels that must be exceeded or not exceeded, depending on the parameter, for recovery to be achieved. These criteria for the recovery area as a whole are as follows:

1. Fifteen females with cubs over a running 6-year average both inside and outside the recovery zone and within a 10 mile area immediately surrounding the recovery zone.

2. Sixteen of 18 BMUs occupied by females with young from a running 6-year sum of observations. No two adjacent BMUs will be unoccupied.

3. Known human caused mortality not to exceed 4 percent of the minimum population estimate based on the most recent 3-year sum of females with cubs. Furthermore, no more that 30 percent of the 4 percent mortality limit shall be females.

Recovery plan population parameters by BMU are available for the last 6 years. Females with COY and occupancy criteria for BMUs all or partially on the Shoshone National Forest are presented below in tables 2 and 3. Mortality data is not summarized by BMU in table 4 as mortalities outside the recovery area on private lands are attributed to the closest BMU by the Interagency Grizzly Bear Study Team for tracking purposes. Presenting data in that manner would overestimate the mortalities actually occurring on or attributed to the Forest for this analysis.

Table 2. Unduplicated Females with Cubs of the Year in BMU's all or partially on the Shoshone National Forest, 1991-1996.*

BMU	1991	1992	1993	1994	1995	1996	TOTAL
CRANDALL/SUNLIGHT	1						1
LAMAR		1	2	2		1	6
SHOSHONE	9	8	4	3	4	5	33
SOUTH ABSAROKA	2	1	2	1	2	3	11
TOTAL	12	10	8	6	6	9	51

* Unduplicated females with COY are reported only for the BMU in which they were first observed. Each female may have used more than the identified BMU during the year.

Table 3. BMUs all or partially on the Shoshone National Forest Occupied by Females with Young, 1991-1996.

BMU	1991	1992	1993	1994	1995	1996	TOTAL
CRANDALL/SUNLIGHT	X	X	X		X	X	5
LAMAR	X	X	X	X	X	X	6
SHOSHONE	X	X	X	X	X	X	6
SOUTH ABSAROKA	X	X	X	X	X	X	6
TOTAL	4	4	4	3	4	4	

Table 4. Known Human Caused Grizzly Bear Mortalities in the Greater Yellowstone Area and on the Shoshone National Forest (SNF), 1987-1996.

Year	Annual Total Mort (SNF)	Total Female Mort (SNF)	Total Mort Limit	Total Mort 6-Yr Avg	Female Mort Limit	Female Mort 6-Yr Average
1987	3 (0)	2 (0)				
1988	5 (1)	3 (0)				
1989	1 (0)	0 (0)				
1990	9 (3)	6 (2)				
1991	0 (0)	0 (0)				
1992	4 (2)	1 (0)	9.4	3.7	2.8	2.0
1993	3 (2)	2 (1)	9.2	3.7	2.8	2.0
1994	10 (2)	3 (0)	8.2	4.5	2.5	2.0
1995	17 (5)**	7 (3)**	6.9	7.1*	2.1	3.2*
1996	9 (1)	4 (0)	8.8	7.1	2.6	2.8*

* 6-Yr average exceeded mortality limit

** 1 female captured and removed from ecosystem in Montana. Mortality attributed to Shoshone National Forest where the original management action (capture and relocation) occurred. Mortalities not tracked to original management action prior to 1995.

Evaluation

All recovery plan population parameters have been met in the recovery area since 1994 with the exception of the mortality limits. Total mortality limits for the GYA were exceeded in 1995 and female mortality limits exceeded in both 1995 and 1996. Approximately 40% of the grizzly bear mortality in the GYA during the last decade was hunter related. Increases in mortality in the GYA in the last few years are likely due to increased populations, expansion into new areas and several poor food years, rather than decreases in habitat effectiveness. The IGBC is reviewing the methodology used to estimate minimum population numbers on which mortality limits are based. Newly published methodology for reducing yearly fluctuation in estimates and increasing reliability may be used.

A population trend analysis completed by the Interagency Grizzly Bear Study Team indicates that the grizzly bear population in the GYA is increasing by about 4% per year. Habitats on the Shoshone National Forest are contributing significantly to the recovery of the grizzly bear. The three BMUs entirely on the Forest have all been occupied by females with young during the last 6 years with one exception for the Crandall/Sunlight BMU in 1994. Approximately 33% of the unduplicated females with cubs in the recovery area during the last six years were observed in the BMUs on the Forest.

Approximately twenty-five percent of the total annual mortality in the GYA in the last decade has occurred on the Shoshone National Forest. However, other population parameters suggest that a large portion of the grizzly bear population uses habitats within the BMUs on the Forest. Additionally, the major population increases and expansion of bears into new areas outside the recovery area is occurring on the Shoshone and Bridger-Teton National Forests. More bears generally equates to more mortalities. Approximately 55% of the grizzly bear mortalities on the Forest since 1987 were hunter related. Both 1994 and 1995 were very poor food years for bears in the GYA and on the Forest and contributed to the higher mortality in recent years.

Although CEM outputs are not available to perform a trend analysis of grizzly bear habitat effectiveness, an evaluation of many of the variables that are used in the model to evaluate HV and HE can provide an indication of trend. The primary parameters used in CEM to estimate HV are habitat type and cover type of the vegetation and the availability of supplemental foods such as ungulates, spawning fish and aggregations of army cutworm moths.

Habitat type is relatively static and few natural changes in cover type have occurred on the Forest since approximately 130,000 acres were modified by the 1988 fires. The effect of the fires of 1988 and subsequent successional changes on grizzly bear habitat value is inconclusive. Man induced changes to vegetation (timber harvest) on the Forest have decreased significantly since 1989. Trend data for created openings (clearcuts and wildfire) and partial cuts on the Forest is available for two time periods (1985-1990 and 1991-1996, see section on Wildlife Habitat Diversity). Less than 1000 acres of created openings resulted from timber harvest activities in the 1985-1990 period. The figure for the 1991-1996 period is 172 acres. Partial cuts modified 4,459 acres from 1985-1990 and 3,174 during the 1991-1996 period. Although, the figures presented are for the entire forest most of the timber harvest occurred in areas potentially occupied by grizzly bears.

The allowable sale quantity in the 1986 Forest Plan was 11.2 average annual million board feet with 2,525 acres potentially being modified by timber harvest annually. An Environmental Impact Statement in 1994 amended the ASQ in the Forest plan to 4.5 average annual million board feet. Acres potentially modified under the new ASQ are 690 annually.

The effects on HV as calculated by CEM from removal of the overstory in most instances is minor as the habitat type is the key in estimating forage value to grizzly bears. The primary potential impact to grizzly bears from timber harvest is increased roading and human access.

The major threat to the long term maintenance of habitat value for grizzly bears in the GYA and on the Shoshone National Forest is from the blister rust. Blister rust can kill whitebark pine, which is the primary fall food for grizzly bears in the GYA. Data is unavailable as to the effects of blister rust on whitebark during the last decade, however efforts are underway through the IGBC to evaluate the extent of blister rust infestation in the GYA.

The primary supplemental foods for bears on the Shoshone National Forest are elk and army cutworm moths. Fish spawning streams on the Forest receive little use by bears. Army cutworm moth abundance has apparently been variable since 1989. Bears were first observed by members of the IGBC feeding on moth aggregations in alpine talus fields in 1986. The majority of the known moth sites are on the Shoshone National Forest. Moth abundance is monitored indirectly by monitoring bear use of known moth sites and because effort, weather, bear sightability, and bear use is so variable no real trend analysis has been completed. It is known that bears made significant use of moth sites in 1991 and 1996 and limited use in 1994 and 1995. The IGBC has been discussing potential ways to monitor moth abundance for future trend analysis.

Winter killed elk carcasses and newly born elk calves and are the most important foods for grizzly bears in spring and early summer respectively. Hunter killed elk carcasses and gutpiles are important to bears in the fall. Trend data indicate that elk populations for all elk herds on the Forest are either increasing or stable. More elk generally means more calves and winter or hunter killed carcasses. See section on Management Indicator Species in this report.

Habitat effectiveness (HE) outputs in CEM are generated by reducing habitat value (HV) due to the presence of human activities. Roads, trails, point source human activities and dispersed human

uses and levels of use of these features are all used to generate HE outputs. Features with high human use have a greater impact than features with lower levels.

Overall human use of the Forest has increased in the last decade as measured by Recreation Visitor Days (RVDs). An RVD is a person on the forest for 12 hours. RVDs in 1987 were approximately 1,031,000 and in 1996 total RVDs were estimated at 1,621,500. Trail use with horses on the north end of the Forest is increasing. Legal off road vehicle use of designated travel ways and illegal use has increased as has use of dispersed campsites. See sections in this report on Wilderness Use and Off-Road Vehicle Use of Designated Travelways.

Of all the features used in calculation of HE outputs in CEM, roads have the greatest impact. This is consistent with recent studies and evaluations of habitat use by grizzly bears. Road mileage has significantly decreased over the last decade. Fourty four more miles have been obliterated over the last 5 years than have been constructed. The Forest plan was amended in 1994 to include a "no net increase in roads" policy. Most of the needed transportation system roads are in place and extensive new roading is not necessary. Road construction activities in the future will be concentrated on upgrading existing roads where necessary. See sections in this report on Roads Closed and Roads Obliterated.

Efforts began in earnest in 1988 to install food storage poles and bear resistant boxes in numerous frontcountry and backcountry areas of the Forest. Numbers of poles and boxes increased significantly through 1991. With the expansion of the bear into areas of the Greybull District numerous poles and boxes have been installed in recent years. All bear resistant facilities at campgrounds were upgraded in 1994 and 1995. Bear resistant dumpsters were installed on all the campgrounds on the Lander District in 1995, ahead of the expansion of the grizzly bear into this area. All campgrounds on the Forest have bear resistant garbage facilities.

The special order requiring all attractants to be kept unavailable to bears was initiated in 1984. The area was expanded several times during the last decade to include additional areas. The latest expansion in 1994 included a large portion of the Greybull District. Information and education efforts continue to increase. Numerous presentations are given on an annual basis on proper behavior in bear country and thousands of pamphlets are handed out annually. Increased attention is being given to educate users in areas recently occupied by grizzly bears. New and additional signs have been and are being installed throughout grizzly habitat informing users of the presence of the bear and the need to store attractants. Interpretive programs were developed on the Wapiti District in 1992 to educate lodge guests about proper behavior in bear country and continue to increase in coverage. Compliance patrols are active throughout the Forest and especially intensive during the hunting season. All of these efforts contribute to the habitat effectiveness for grizzly bears on the Shoshone National Forest. See section on Compliance with Grizzly Bear Guidelines in the 1996 monitoring report.

One of the greatest threats to habitat effectiveness in the GYA is increased private land development and subsequent increased demands on public lands. The Forest, in cooperation with other forests and agencies in the GYA, is currently developing a long term strategy for conservation of the bear. Monitoring of private land development and increased use of public lands will be part of that strategy.

The Forest is cooperating in efforts through the IGBC to develop ecosystem-wide access standards for road density and core area (areas free of roads and high use trails) that will help ensure the maintenance of habitat effectiveness for the grizzly bear.

Although human recreation use has increased in the last decade on the Forest, road miles have decreased, timber harvest levels have decreased and availability of ungulate foods for bears has increased. Bear numbers are increasing and they are expanding their range into areas of the Forest only historically occupied. Efforts to keep attractants unavailable to bears have increased dramatically since 1988. The Forest has given special attention to increasing public contact, education, and compliance with the Special Food Storage Order. The Forest consulted with the U.S. Fish and Wildlife Service on all projects potentially affecting the grizzly bear throughout the decade. In 1996 a new initial review process of all projects was initiated with the Service in order to improve consultation efforts. Habitat effectiveness appears to have been stable to increasing on the Shoshone National Forest since 1987 as measured by the methods currently available. The CEM and access analysis process will be used in future years to more quantitatively monitor habitat effectiveness.

WILDLIFE TRENDS

Wildlife Habitat Diversity

The term wildlife habitat diversity as used in the Forest Plan generally relates to the successional or structural stages of plant communities, and their relative abundance and arrangement across the forest environment; horizontal diversity. It also relates to the layering from top to bottom of vegetation within plant communities or stands; vertical diversity. It is recognized that other non-vegetation factors such as rock, scree, talus, and water environments also provide habitat and contribute to diversity. However, the intent of the monitoring element in the Forest Plan monitoring and evaluation chapter was a primary focus on vegetation horizontal diversity across the forest with enough monitoring also to insure meeting vertical and other diversity standards. The vertical diversity standard is usually addressed in conjunction with specific project proposals such as timber sales. Thus the primary focus of this forestwide analysis for this sub-element was vegetation horizontal diversity across the Forest.

The Forest plan description of broad vegetation types included alpine, coniferous forest, montane meadow-parkland, sagebrush-grassland and riparian. The Allowable Sale Quantity EIS completed in 1994 listed the following seven broad types of forested wildlife habitats; Englemann spruce, subalpine fir, limber pine, whitebark pine, douglas fir, lodgepole pine and aspen. That document also stated that these types are often grouped into the spruce-fir forest, mixed conifer forest, lodgepole forest, and aspen forest, with the mixed conifer typically dominated by douglas fir mixed with other conifers. The recently completed Environmental Assessment for the Range analysis listed the following broad vegetation types for Shoshone National Forest Rangelands: riparian, meadow, sagebrush/grass, grassland, conifer with forage, aspen/forb, alpine/grassland, and transitory range. For the current analysis, Forest vegetation was broadly defined as it currently exists in the data base by the following structural types: grass/forb, shrub/seedling, sapling/pole, mature forest, and old growth forest.

An examination of the available forestwide vegetation data was made to first determine the existing situation in terms of vegetation types and structural stages. The data was also split by Ranger District to examine the distribution of habitat diversity/structural stages across the Forest. The overall results of that analysis are shown in Table 1.

Table 5. Estimated Acres of Wildlife Habitat Structural Stages (SS) on the Shoshone National Forest

District	SS 1	SS 2	SS 3	SS 4	SS 5	Total
Clarks Fork	131,114	31,390	33,072	250,708	5,250	451,534
Greybull	145,561	25,669	5,905	132,155	652	309,942
Washakie	59,670	27,488	95,453	100,891	1,682	285,184
Wapiti	171,931	41,219	17,808	512,052	4,442	747,452
Wind River	145,739	46,553	52,537	251,364	10,508	506,701
Forestwide	654,015	172,319	204,775	1,247,170	22,534	2,300,813
Percent	29%	7%	9%	54%	1%	

* Stage 1= grass/forb; stage 2= shurb/seedling; stage 3=sapling/pole; stage 4=mature forest; stage 5=old growth

Of the total acres on the Forest that have vegetative cover of any kind and have been classified (2,300,813 estimated acres) over half (54%) is classified as mature forest. The vast majority of that is mature coniferous forest as only slightly over 5,000 acres, of the 10,000 acres plus of forest hardwoods, are currently estimated as mature hardwoods; aspen, or cottonwoods. An additional 29% of forestwide vegetation is currently in the grass/forb stage, of which approximately 40% is on lands that will ultimately succeed to timbered lands while approximately 60% is permanent grasslands of various types. The final remaining forestwide vegetated acres are comprised of an estimated 7% shrub/seedlings, 9% sapling/poles, and 1% old growth. While the estimated amount of forested area currently classified as old growth forest is very low, extensive acres of mature forest occur on each district. A considerable amount of these acres should succeed to old growth forest over time. A relatively small amount of habitat currently exists in the shrub/ seedling and sapling/pole stages, and a relatively small amount also currently exists in the grass/forb stage as potential replacement for shrub/seedlings and sapling/poles.

The present status of wildlife habitat diversity as measured by the type and relative abundance of structural stages should not be too surprising. Historically, disturbance agents, particularly wildfire, played a much more significant role in shaping the vegetation type, pattern, and structure across the forest than in the recent past or present times. That and insect and disease activity combined with the variation in terrain, aspect, and Forest geology resulted in the presence of a wide variety of vegetative structures with varying stand densities and a high amount of edge. This described a very diverse wildlife habitat situation.

In the past decade, the Clover-Mist and Unit 40 wildfires in 1988 burned approximately 130,000 acres. Although burn intensity and other characteristics differed from many historic burns, these events resulted in a decreased amount of mature forest habitat and increased acres in earlier successional stages. The amount of designated wilderness, highly dissected nature of the terrain, and other factors limit options for manipulating timber stands through conventional logging systems. Currently timber harvest affects only about 690 acres on the Forest each year. The majority of treatments on these acres are shelterwoods which often help provide for vertical diversity, but do not alter the structural stage in terms of setting back succession similar to treatments like clearcuts or seed tree harvests. On forested lands, it is likely that the trend toward a late successional forest will continue unless the historic role fire has played can be re-instituted to some degree. The value of a natural mix of intermingled non-forest plant communities with the various forest structural stages becomes more apparent given these considerations.

Early in the analysis process, it was determined that a focus on individual years would generally provide few insights into changes in forestwide habitat diversity because of the relatively few acres affected in most years by factors such as wildfire and timber harvest, and because of the relatively slow process of natural vegetation succession. In recent times the exceptional year for wildfire was 1988 when a significant number of acres burned. In addition, the Forest vegetation data base has only been operational for a relatively short period of time with baseline or existing situation information. Updates to allow addressing questions such as natural rates of succession are currently not possible.

To further examine the habitat trend question, a decision was made to group some existing forest vegetation modification data from 1985 to 1996 into two groups of years (1985-90 and 1991-96) to determine the amount of habitat modification during those two periods. The parameters examined were openings created due to timber harvest or wildfire, and partial timber harvest cuts during the two periods. These items were selected since the majority of habitat changes other than plant succession relate to these two factors. Table 6 summarizes the information examined by ranger district. As expected, the open areas created by the 1988 wildfires resulted in substantial openings created during this period while few have been created since then. With regard to partial timber cuts and subsequent changes in habitat diversity the acre figures for year groups were similar but lower in the last year group reflecting a reduction in partial cut treatments because of the the 1988 fires and a subsequent lowering of timber treatment areas.

Table 6. Estimated Acres of Open Areas and Partial Cuts Created by Fire and Vegetation Management on the Shoshone National Forest for Two Periods: 1985-90 and 1991-96.

	Created Openings		Partial Cuts	
District	**1985-90**	**1991-96**	**1985-90**	**1991-96**
Clarks Fork	55,560	0	516	864
Greybull	0	5	77	163
Washakie	1	36	545	0
Wapiti	29,832	0	198	528
Wind River	966	121	3123	1619
Forestwide	86,359	172	4,459	3,174

Most of the created openings shown for the Clarks Fork and Wapiti districts for the 1985-90 period were caused by the 1988 wildfires. Less than 1000 acres of created openings were created from forestwide timber harvest activities during this same period. As shown in the table, few openings were created from both fires and timber management activities during the 1991-96 period. Again the data seem to demonstrate that the trend toward a mature late successional stage forest will likely continue, and that under the present management scenario the primary tool available to influence wildlife habitat diversity is prescribed fire.

Cavity Dependent Species Habitat

The data presented in table 6 above indicates the mid to late successional stage mature forest habitat required to produce snags necessary for cavity dwelling wildlife is relatively abundant on the Forest. It also indicates it is fairly well distributed across the Forest. Forestwide, an estimated 55% of of the acres that have vegetative cover of any kind are made up of the mature and old growth structural stages. These stages also occur in a variety of species types including Englemann spruce/subalpine fir, douglas fir, lodgepole pine, whitebark pine, and aspen/cottonwood. It is recognized that some mature conifer stands particularly those with low densities provide only limited snags for wildlife. However, the existing forest stand structure is also made up of many stands with mid to high level densities with higher numbers of snags per unit area.

As the data in table 6 demonstrates, certain factors have caused a trend resulting in a current forest vegetation mix composed of a large percentage of late forest successional stages. These factors include items such as large acreages of wilderness and thus no active timber stand manipulation, and suppression of potential disturbance agents such as wildfire. This is particularly true for forest coniferous tree species. Currently an estimated 1,858,427 acres on the forest is composed of conifers in all structural stages. Approximately 68% of this occurs as mature forest in late (4 or 5) structural stages.

The trend for hardwood species on the forest is drastically different. Currently the forest vegetation complex is estimated to be comprised of only 10,000 to 15,000 acres of aspen and cottonwoods. Although the historic acres of deciduous hardwoods on the forest is not known, casual observations and recent inventory work on some districts demonstrate the relative abundance of these types are decreasing as succession progresses and conifers invade. Since these species are, in many situations, early invaders following disturbance events, reversing the downward trend will require a more proactive management approach with disturbance agents such as prescribed fire, and conifer harvest. An environmental docu-

ment is currently in progress to address aspen regeneration on the North Zone of the Forest. Work addressing this issue is also in the planning stage for the Forest South Zone.

Population and Habitat Trends of Management Indicator Species

Seventeen wildlife species, in addition to game trout, were selected during the Forest planning process as management indicators. This included five recovery species; bald eagle, peregrine falcon, black-footed ferret, gray wolf, and grizzly bear; five featured species; elk, mule deer, bighorn sheep, moose, and mountain goat, and seven ecological indicator species. This part of the report will address all those species except the grizzly bear and wolf. For analysis of the status of those species see the Threatened and Endangered Species section of this report.

As part of the ongoing effort to monitor trends for wildlife species of concern (Endangered, Threatened, Sensitive, Management Indicators), the Shoshone National Forest has, in recent years, entered into several cost-share agreements with other agencies to obtain mutually beneficial data. During the past year the Wyoming Game & Fish Department (WG&FD) operating under such an agreement completed an Interim report summarizing available information on the status of many such species. Much of the following information is derived from that report as well as other known and readily available Forest data.

Recovery species

Bald Eagle - There has been a dramatic increase in bald eagle nesting populations during the past two decades in Wyoming and Montana. The number of nesting pairs in Wyoming has increased from 20 in 1978 to over 70 pairs in 1996. Currently no nests are known to occur on the Forest although two pairs of eagles were known to nest near the Forest in 1996. Both pairs successfully fledged 2 young. Nesting on the Forest seems likely in the future as the Greater Yellowstone Area population expands. A few eagles winter on or near the Forest's major drainages.

Special habitat requirements for bald eagles include open water and large trees for nesting, perching, and roosting. It is believed that the current low numbers of nesting pairs on the Forest is related to marginal habitat conditions of a relatively limited prey base during brood rearing, and a somewhat short supply of suitable nest structures adjacent to aquatic habitats. However, it is expected that the exploding eagle population in nearby areas will push nesting pairs into the available Forest habitats during the next decade. Artificial nesting platforms could probably be considered to increase the probability of nesting in some areas. They are not believed necessary at this point or necessarily a wise expenditure of scarce resources given the current eagle population and trend in adjacent environs.

Black-footed Ferret - As indicated in the 1995 Forest Monitoring and Evaluation report, there is no recent evidence of wild ferrets on the Forest. Historically this species occurred in prairie dog towns in the South Fork Shoshone River and Greybull River drainages below 8000 feet. However, information compiled by the Nongame Office of the WG&FD indicate there are no significant prairie dog town complexes which would constitute ferret habitat on the Forest. In addition, there currently is no evidence that this species occurs in any of its historical range in Wyoming except where it has been reintroduced. The current assessment is that no biological reason exists to have any management concern for this species on the Forest.

Peregrine Falcon - The Forest has been participating with other agencies in the cooperative recovery program for this species for the past decade. Over 131 birds were successfully released on the Forest or immediate adjacent areas between 1987 and 1995. Reintroduction efforts have

ceased because most recovery objectives have been attained. Nest surveys conducted on the Forest show a steadily increasing trend from none observed in 1987 to 11 nesting pairs in 1996. The number of young peregrines fledged on the Forest increased from none to 85 during the same time period. Intensive monitoring efforts are expected to continue for at least five more years to document recovery. However, with the availability of nesting cliff habitat, and open areas for hunting, the upward trend toward a viable stable population is expected to continue.

Featured Species

These species are the major big game species that occur on the Forest. The reader is referred to table 5 above and the associated narrative under the wildlife habitat diversity section for discussion related to current trends of Shoshone National Forest forested habitat. In addition, the Riparian Condition section of this report provides insight into the trend of this habitat type which is of importance to many wildlife species, but of particular importance with respect to moose. Finally, an environmental assessment (EA) for 36 livestock grazing allotments on the Forest this past year summarized what is known about the current trend of grassland and other major ungulate foraging habitats for these areas.

Generally, it was concluded and documented in the allotment grazing EA in 1996, that most grassland habitats were in an upward trend and slowly moving toward desired condition. It was noted for specific allotments, however, that some problems do exist with overgrazing concerns due to livestock or wildlife (primarily elk but also bighorn sheep in some areas like the Ishawooa Hills allotment) or both. The existing condition of riparian shrubs on some allotments was of noted concern. It was also determined that natural plant succession on some areas of transitory range on the South Zone of the Forest have decreased available forage for ungulates and a decision to reduce permitted livestock grazing was made. Recommendations were also made to keep elk populations within the carrying capacity of the available habitat.

A few other habitat changes and concerns currently existing on the Forest are worthy of mention. These include conifer encroachment in traditional bighorn sheep migration routes on the South Zone of the Forest. Timber harvest contracts are currently in progress to improve these travel corridors. On the northern part of the Forest, there has been some localized concern expressed recently due to the loss of mature spruce-fir forest in the 1988 wildfires. The widely dispersed moose population in the area depends heavily on this habitat type for winter survival. The habitat changes brought about by the fires that provide forage for early successional stage species such as deer and elk, and snags for cavity dependent species could result in a localized decline in moose numbers. Finally, the trend for mountain goat habitat on the Forest appears stable due to the remoteness of the terrain, and a lack of disturbance, such as mineral exploration, which might adversely affect the high alpine and subalpine habitats in the Beartooth Mountains that comprise the habitat for this species. Domestic cattle and sheep grazing occurs in part of the existing goat range but no potential conflicts have been identified.

Information relating to the population trend of big game management indicator species for herd unit areas that are on or partially on the Forest is summarized in Table 7. Some herd unit areas have been combined since 1985 when information was assembled for the Forest Plan. Table 7 reflects the most current herd unit areas. As the table indicates the trend has been an increase in big game numbers for the herd units of many species, particularly elk. In some instances the increase has been considerable. However, it should not be assumed that animal numbers have increased from approximate objective levels in 1985 to present day numbers. In some instances, refined modeling techniques simply have resulted in better predictions of on the ground numbers and objectives have been updated accordingly.

Table 7. Big Game Management Indicator Species Objectives, Estimated Numbers and Trend. ('+' = increasing, '-' = decreasing, '0' = stable)

Location	Species	1985 Population Objective	Present Population Objective	Current Estimated Population	Trend Past Decade
Clarks Fork	Elk	3550	3000	3450	+
Cody	Elk	4300	5600	7300	+
Gooseberry	Elk	1800	2700	2777	+
Wiggins Fork	Elk	4800	4800	7200	+
South Wind River	Elk	3300	3300	3460	0
Clarks Fork	Bighorn Sheep	500	500	470	0
Trout Peak	Bighorn Sheep	440	750	600	+
Wapiti Ridge	Bighorn Sheep	875	1000	1000	+
Franc's Peak	Bighorn Sheep	1000	1360	1218	+
Yount's Peak	Bighorn Sheep	900	900	679	0
Whiskey Mtn.	Bighorn Sheep	1060	1350	952	+
Clarks Fork	Mule Deer		9000	7400	0
Upper Shoshone	Mule Deer		12000	13250	+
Owl Cr/ Meeteetse	Mule Deer		8000	4850	-
Dubois	Mule Deer		5800	10000	+
South Wind River	Mule Deer		13000	8530	+
Clarks Fork	Moose	175	175	160	0
Shoshone	Moose	150	150	150	0
GB-Gooseberry	Moose	115	180	130	+
Dubois	Moose	350	400	370	+
Lander	Moose	350	450	496	+
	Mountain Goat	150	200	200	+

Ecological Indicators

Pine Marten - This species requires mature coniferous forest cover with canopy cover ranging from 30-70% for winter survival. During the spring, summer and fall a wider range of vegetation types will be occupied depending on prey availability. Large clearcuts or burned areas are generally avoided especially during winter. As demonstrated in table 3 above the trend on the Forest has been toward a late successional stage mature conifer environment in many areas; clearly preferred marten habitat. Martens were found on each snowmobile route on the Forest during the winter of 1995-96 when 233 miles of snow track surveys were conducted. The average rate of occurrence was .7 marten per mile of route. The marten appears to be widely distributed over the Forest and occurs wherever suitable habitat is available. The species is legally trapped in Wyoming and on the Forest, and harvest figures indicate a relatively stable population over the past decade.

Goshawk - This species is often associated with dense mature or old growth conifer, aspen, or mixed conifer aspen stands. Although the species exhibits habitat preferences in specific areas, they nest in a variety of habitat types. Goshawks appear to be relatively common in Wyoming including the Shoshone. As demonstrated in table 3 above the trend on the Forest has been toward a late successional stage mature conifer habitat which should provide abundant habitat for this species. However, as noted earlier in this report, the existing situation for aspen on the Forest appears to be one of decline. Future efforts to regenerate declining aspen stands is currently being planned.

No specific population survey work for goshawks has been conducted recently on the Forest. The WG&FD has assigned this species a lower priority for their non-game work in the past because of its widespread distribution, general abundance, and apparent adaptability to different habitat types. However, currently Forest and WG&FD personnel are discussing ways to efficiently conduct some additional survey for this species.

Brewer's Sparrow - This species uses early to late shrub vegetation stages having an abundant understory of herbaceous vegetation and brushy cover. On the Forest it is associated with sagebrush dominated areas and generally nests in sagebrush varying from 12 to 26 inches in height. Distribution of the species in Wyoming includes all 28 Latilongs, with confirmed or probable breeding occurring in 27 of the 28 Latilongs. Confirmed breeding has been documented in those Latilongs that include the Forest (Latilongs 2, 9, 16, and 17). The three Breeding Bird survey routes that occur on the Forest (Hunter Peak, Horse Creek, and Fiddler Lake) have all documented the presence of the Brewer's sparrow. In 1996, this species was recorded on all three Forest survey routes. A relatively high nineteen individuals was recorded for the Horse Creek survey route in 1996. It is believed that the three existing breeding bird survey routes are sufficient to adequately monitor the presence/absence and contribute to the statewide population trend analysis for this species. Although the Forest may not have an abundance of habitat usually associated with this species, where habitat does occur it appears that the Brewer's sparrow can generally be found.

Hairy Woodpecker - This species inhabits coniferous and aspen forests generally from 6,000-9,000 feet in elevation during the breeding season and lower habitats during the winter, especially cottonwood-riparian habitat. Special habitat requirements include trees over 10 inches (diameter at breast height) for nesting. Cavities are usually excavated in snags or in live trees with decaying heartroot. As indicated in table 3, above the Forest has an abundance of habitat usually associated with the needs of this species. The Forest provides habitat for this species during both the breeding and non-breeding seasons. Confirmed nesting has been documented in all Latilongs that are a part of the Forest. The breeding bird survey routes that occur on the Forest have all documented the presence of the species and it is believed these routes are able to adequately monitor presence/absence and contribute to statewide population trend analysis. Preferred habitat for the species does not appear to be restricted and current population trends seem stable.

Beaver - Good habitat for this species is characterized by a permanent, relatively constant flow of water of at least 0.5 cubic feet per second, accessible foods such as willow, aspen, or cottonwoods, and a relatively wide valley with low channel gradient (Olson and Huber, 1994). Optimum stream gradients are less than 3%, and valley widths exceeding 150 ft. are most suitable. For stream environments, maintenance of a beaver colony is believed to require approximately one-half mile or more of stream channel.

Although bank dwelling beaver are scattered throughout most of the major drainages on the Forest where suitable habitat occurs, recent observations of lodges, dams or colonies have been made by Mark Mckinstry and Carter Kruse in the following locations: Sweetwater drainage - Rock and Beaver Creeks; Little Popo Agie - Pass, Snow, and Cherry Creeks; Middle Fork Popo Agie - Sawmill, Townsend, and Roaring Fork Creeks; North Fork Popo Agie - Sanford Park; Wind River - Torrey, Jakey's Fork, Horse, Sixmile, Trout, South Fork Fish, Sheridan Creek and Upper Wind River; Clarks Fork - Sunlight, Gilbert, Lake Creek, and Libby Lake area; Greybull River - West Timber Creek.

Generally speaking much of the Forest stream habitat is too steep, the valleys too narrow, the substrates of unstable volcanic origin, and deciduous food supplies too limited to provide good beaver habitat. Also as indicated elsewhere in this report, declining aspen and cottonwood habitats have likely contributed to very localized declines in beaver numbers in some drainages. As opportunities are identified and implemented to regenerate declining deciduous vegetation throughout the Forest, limited opportunities may also be available to provide additional habitat for beaver. Statewide beaver populations have recently increased due to changes in land use and regulated harvest. Population trend on the Forest appears stable given the available habitat. In some areas of Wyoming, including private land on the North Fork Shoshone River drainage, attempts to reestablish beaver are occurring in suitable habitat, and in other areas beaver are being removed to solve damage problems.

This species is classified as a furbearer in Wyoming and trapping is permitted on most areas of the Forest. All Forest lands within the Little Popo Agie River drainage, and Sawmill Creek drainage are closed to trapping as are parts of the Sweetwater River drainage.

Blue Grouse - Habitat associated with this species includes spruce-fir, open lodgepole pine, aspen-shrub, mountain meadows, and mountain shrublands. Open space is required for displaying during courtship and thickets of coniferous or deciduous trees are necessary for protective cover. Blue grouse breed at lower elevations in open stands of conifers or aspen, or in meadows adjacent to these types. During the fall they migrate up in elevation to stands of conifers or to timberline.

Information obtained from the Wyoming Game and Fish Department wildlife observation system as well as other observations by Forest personnel indicate this species is common on the Forest. As with most gallinaceous birds, their annual abundance can fluctuate widely depending on seasonal weather during the nesting period. They are a hunted species in most mountainous areas of the state and on the Forest. Because of natural annual population fluctuations, any conclusions regarding habitat or long term population trend based on observations or harvest figures would have to be made with considerable caution. The diversity of habitat situations on the Forest as shown in table 3 above indicates a relatively secure future for this species on the Forest.

Ruffed Grouse - The distribution of this species throughout most of its range coincides closely with that of quaking aspen. Drumming sites with downed aspen or conifer logs are a special habitat requirement. Aspen mixed with conifers, and openings are also key habitat components. As these requirements would indicate, this species has likely never been one of great abundance on the Forest. Nevertheless, they along with other species associated with the aspen/conifer mixed forest add considerably, to the Forest's wildlife diversity. Observations from the wildlife observation system of the Wyoming Game & Fish Department and Forest personnel indicate a continual presence of ruffed grouse where available habitat exists. As with blue

grouse, they are a hunted species in Wyoming and on the Forest and similar factors contribute to annual population fluctuations. Ruffed grouse are also cyclic throughout much of their range which can also affect observed or harvested numbers. Although their is not an abundant opportunity on the Forest to manage habitat for ruffed grouse, it is likely that where such opportunities exist and are implemented, they will contribute to maintaining the presence of this species.

FACILITIES TRENDS

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

The road construction/reconstruction monitoring item in the Forest Plan initially included only arterial and collector roads. However, projections in the Forest Plan (see Table III-1, page III-15) related to collector and local roads making it difficult to compare projections with actual accomplishments. The majority of roads constructed or reconstructed since the plan was released have been local roads. This was one of the reasons the Forest Plan monitoring requirements were amended in 1994 to include local roads.

Following are Forest Plan projections for collector and local road construction/reconstruction:

Table 8. Projected Road Construction/Reconstruction 1985-2000

Miles	Collector	Local
1985-90 Road Construction	2.0	4.6
1985-90 Road Reconstruction	7.4	2.3
1991-00 Road Construction	2.0	5.6
1991-00 Road Reconstruction	1.7	1.9

Following are the actual miles of road construction and reconstruction accomplished in Fiscal Years 1987 - 1996.

Table 9. Actual Road Construction (Miles)

Year	Local Roads
1987	11.0
1988	3.0
1989	2.0
1990	13.0
AVERAGE	7.3
1991	6.0
1992	1.0
1993	4.0
1994	2.0
1995	0
1996	1.0
AVERAGE	2.3
10-yr AVERAGE	4.2

Table 10. Actual Road Reconstruction (Miles)

Year	Arterial	Collector	Local
1987	25.6	1.5	2.7
1988	0	6.6	6.7
1989	0	0	2.2
1990	0	8.1	7.2
AVERAGE	6.4	4.1	4.7
1991	0	0	4.9
1992	1.0	0	2.7
1993	0	0	3.8
1994	3.5	0	0
1995	0	0	0
1996	0	0	4.4
AVERAGE	0.8	0	2.6
10-yr AVERAGE	3.0	1.6	3.5

Evaluation

Virtually all new road construction during the past ten years has been local road construction. With the exception of a few tenths of a mile related to recreation or administrative site access, all the mileage was associated with the Forest's timber sale program. New local road construction between 1986 and 1990 averaged 159% of that projected in the Forest Plan. Much of the additional new mileage occurred as a result of the salvage of timber burned in the fires of 1988. New road construction for the period 1991 - 1996 averaged 75% of that projected in the forest plan. The ten-year average of 4.2 miles per year is below both the 1985-90 and 1991-2000 average annual outputs projected by the Forest Plan. The trend for new road construction appears to be declining.

From a forest management standpoint, there was no need to construct new arterial or collector mileage. The arterial and collector road system for the Shoshone is mostly in place. In several instances where the Forest Plan predicted a need for a collector road, closer, project evaluation showed that a collector road was either not necessary or that the necessary access could be accomplished with a local road.

Road reconstruction has been spread across all the road categories (arterial, collector and local) during the past decade. The arterial work was spot safety improvements on the Louis Lake Road. Collector road reconstruction was mixed 40-60 between general purpose/recreation roads and timber access roads. All but a few tenths of a mile of the local road reconstruction was in support of the timber program.

Local road reconstruction between 1986 and 1990 averaged 204% of that projected in the Forest Plan. Local road reconstruction for the period 1991 - 1996 averaged 137% of that projected in the Forest Plan. The ten-year average of 3.5 miles per year averaged about twice the 1991-2000 average annual outputs projected by the Forest Plan.

Collector road reconstruction between 1986 and 1990 averaged 55% of that projected in the Forest Plan. There was no collector road reconstruction between 1991 and 1996. The ten-year average of 1.6 miles was well below the predicted average for the decade.

The Forest Plan had no predicted outputs for arterial road reconstruction.

Construction and reconstruction of roads varies considerably from year to year. Because of high outputs in some years and almost no outputs in others it is more practical to compare trends over a period of several years with Forest Plan projections than to compare annual outputs. Though this item is monitored annually, comparing it to Forest Plan projections is difficult given changes that have occurred. For example, up until this monitoring item was amended in August of 1994, local road construction and reconstruction was not included. Yet the majority of roads constructed and reconstructed were in fact local.

A policy of "no net increase in roads" was adopted in the same amendment. This policy reinforces direction in the Forest Plan which states that "most local roads constructed for timber harvest will be closed to public use" except for reasons that include public safety. Cumulative effects analysis conducted in support of the Oil and Gas EIS (December 1992) and the Allowable Sale Quantity Amendment led to the determination that additional guidance was necessary to mitigate cumulative effects. Hence the "no net increase" policy. Many of the miles of local road construction and reconstruction shown in the tables above have been closed or obliterated. See the following sections on Roads Closed and Roads Obliterated.

Deviations from Forest Plan projections have occurred for other reasons as well. On the Shoshone National Forest virtually all road construction and much of the reconstruction is tied to timber sales. For example in 1987 all eleven miles of road were constructed for two timber sales - Squaw Creek and Wolf Creek. Between 1989 and 1992 harvest activities increased in an effort to salvage timber burned during the Yellowstone fires of 1988. In 1990 roads were constructed to access five timber sales - Blowdown Salvage, Upper Clint Creek, Camp Creek, One Mile East and One Mile West - resulting in higher outputs than projected. Once the bulk of salvageable timber was removed, harvest levels decreased. Consequently road construction and reconstruction in the six year period between 1991-1996 occurred at lower levels than in the first four year period following release of the Plan.

Funding levels have had a major impact on the Forest's ability to implement Forest Plan programs including timber and road building. The Shoshone timber budget dropped substantially in 1993 from what it had been in the previous two years. It remained low through 1994 - 1996. This has had a direct affect on road construction and reconstruction on the Forest.

The trend on the Forest appears to be going away from new road construction and toward reconstruction of existing roads to accomplish Forest programs. Virtually all of the transportation system's arterial and collector roads are already in place. Local, low impact roads are also in place in most areas. Because of the topography and vast amounts of wilderness, there is generally, no need for extensive new roading. There is, however, a need to upgrade the existing system to meet the needs of the public and commercial users. As the demand for access into and through the national forest increases, there will be a demand for improved roads. This need is reflected somewhat in the increase over Forest Plan projections for road reconstruction. Reconstruction not only provides for the needs of the public, but it allows protection of the substantial investment that the public has in the Forest's road system and allows for correction of road-related negative effects on the Forest's resources.

Roads Closed (System Road Miles Closed by Project Activities)

This item was added to the monitoring requirements in the Forest Plan amendment to monitor the "no net increase in roads" policy (Allowable Sale Quantity, Record of Decision, August 1994). The Forest Plan has direction that "all newly constructed roads be closed to public motorized use "subject to a number of considerations including public safety and public need" (Shoshone National Forest Land and Resource Management Plan, page III-8). This direction has been implemented on the Forest. Roads that were constructed for short term uses, such as timber sales, were subsequently closed or obliterated.

The Forest Plan predicted output for closed roads indicates a constant 99 miles each year through 2010. This figure is the number of miles of closed roads on the Forest in any given year, not the number of new miles physically closed per year.

Evaluation

Road miles constructed, reconstructed, closed or obliterated by road related projects have been tracked on the Forest by virtue of required year-end reports to Congress. Data on roads closed or obliterated by non-road projects had not been collected or reported before the 1994 amendment to the Forest Plan. Miles of roads closed in the latter situation could be tracked indirectly by checking the Transportation Inventory which is updated annually by the districts to reflect changes in the road system. This method would show mileage changes from one year to the next but would not be road specific or differentiate between miles added, deleted or corrected.

As is the case with road construction and reconstruction, it is more useful to look at trends over several years than data for a single year (see table below). Although no roads were closed in FY 94 or FY 95, 29.2 miles were obliterated while only 2 miles were constructed during that two year period. Since the Forest Plan was published an average of 4.2 miles per year have been constructed, 3.6 miles per year closed and 6.4 miles per year obliterated.

The number of inventoried miles of closed road on the forest has not been monitored on an annual basis, but has been 250 - 300 miles each year for the past decade. The value of of monitoring the miles closed per year gives an indication of the trend and is much easier to track. If used with the annual accounting of miles obliterated, an overall trend can be determined with respect to the total potential for resource disturbance associated with roading. Comparing the sum of road miles closed and the miles obliterated to the new miles of road constructed, there is a downward trend in overall open roading on the Forest over the past decade. With a downward trend in both existing and open roads, there is an associated downward trend in road-related negative effects to the Forest's resources.

Roads Obliterated (Road Miles Obliterated by Project Activities)

This item was also added to the monitoring requirements in 1994 to monitor the "no net increase in roads" policy and goes hand-in-hand with the previous item. Miles of new Forest development road are measured against road miles obliterated so that for each five year period, beginning October 1, 1994, the number of miles of new Forest Development road construction does not exceed the number of miles of road obliteration, forestwide. A road is obliterated when its functionality is eliminated by reclamation/restoration and it is returned to resource production. The road ceases to exist and is removed from the Forest Development Transportation System. Miles of roads constructed, closed and obliterated are shown in the following table.

Table 11. Roads Constructed, Reconstructed, Closed and Obliterated

Activity	FY87-90	FY91	FY92	FY93	FY94	FY95	FY96	Average
Mi Recon								
- Art.	25.6	0	1.0	0	0	0	0	3.0
- Coll.	16.2	0		0	0	0	0	1.6
- Local	18.8	4.9	2.7	3.8	0	0	4.4	3.5
Mi Const	29.0	6.0	1.0	4.0	2.0	0.0	1.0	4.2
Mi Closed	25.8	3.7	.9	2.5	0.0	0.0	3.0	3.6
Mi Oblit	7.2	5.3	12.3	1.5	10.0	19.2	9.0	6.4
Annual Net		0.7	-11.3	2.5	-8.0	-19.2	-8.0	
5-Yr Net		22.5	0.2	-0.3	-10.3	-35.3	-44.0	

Exhibits 1 and 2 graphically display the above information.

Evaluation

The five year net road mileage on the forest, measured in accordance with the amended Forest Plan guidelines shows a definite decrease in the miles of road on the Forest. Forty-four more miles have been obliterated over the last five years than have been constructed. If this trend continues, there will be a significant decrease in the road-related negative effects to the Forest's resources.

Exhibit 1

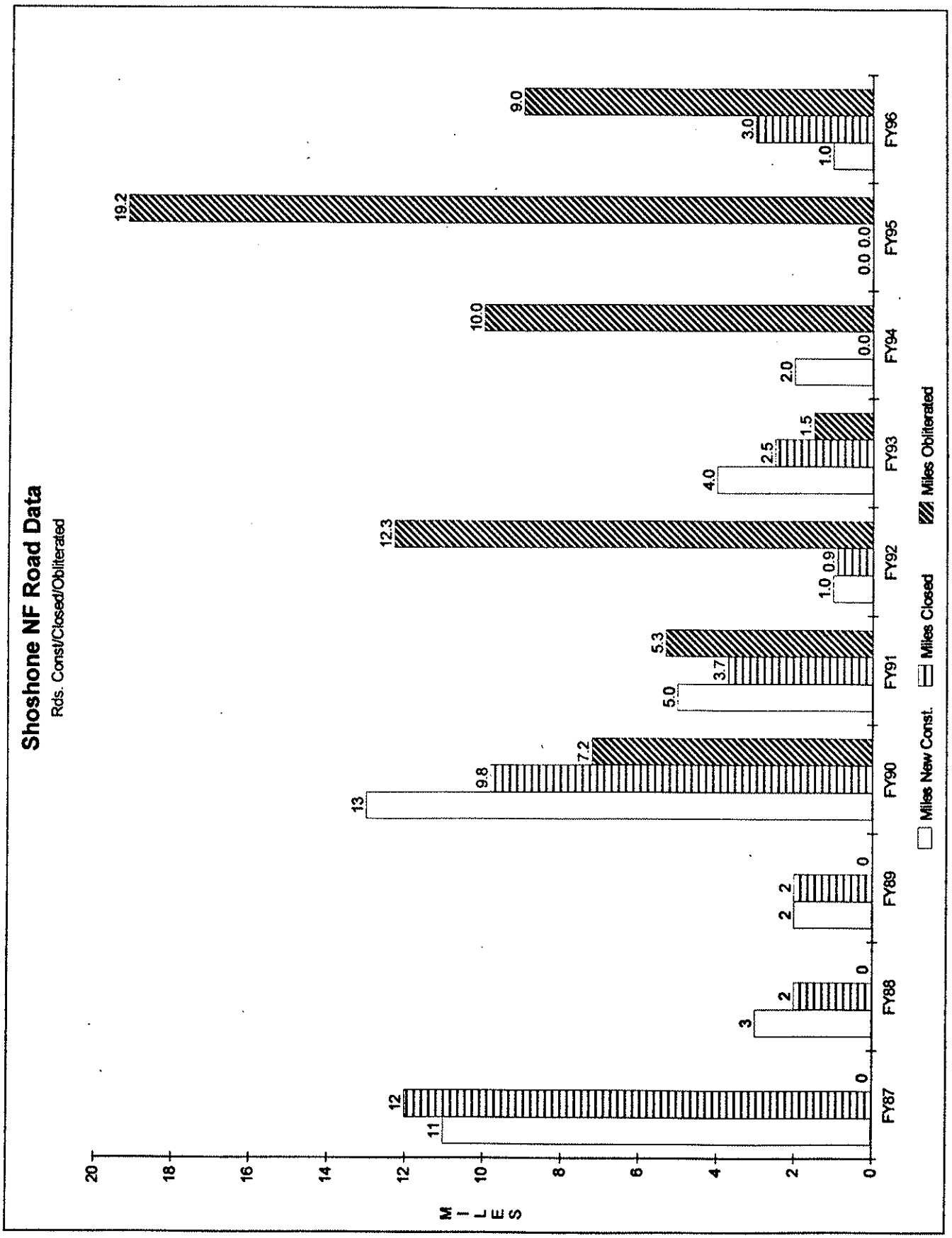
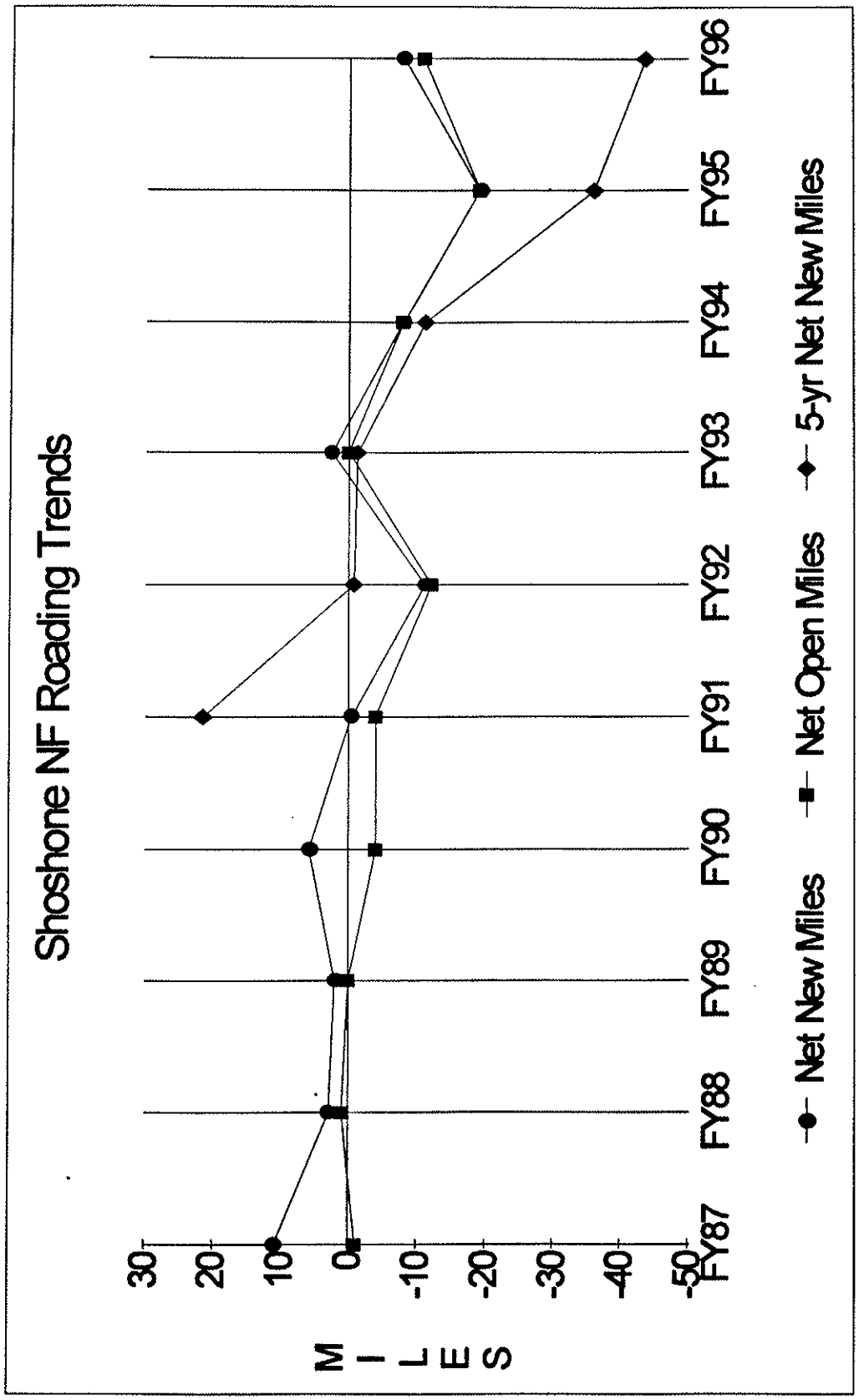

Shoshone NF Road Data
Rds. Const/Closed/Obliterated
MILES
20
18
16
14
12
10
8
6
4
2
0
FY87
FY88
FY89
FY90
FY91
FY92
FY93
FY94
FY95
FY96
12
11
0
3
2
2
2
0
13
9.8
7.2
5.0
3.7
5.3
1.0
0.9
12.3
4.0
2.5
1.5
2.0
0.0
10.0
0.0
0.0
19.2
1.0
3.0
9.0
Miles New Const.
Miles Closed
Miles Obliterated

Exhibit 2



Net New Miles = Annual difference between newly constructed and obliterated road miles.
Net Open Miles = Annual difference between newly constructed miles and the total of obliterated and closed miles.
5-yr Net New Miles = Running 5-yr sum of the value of "Net New Miles".

WILDERNESS TRENDS

Wilderness Use

DATA SOURCE: Citations, warning notices, ranger observations/notes/photos; permits, trailhead registration, recreation livestock use forms.

TIME SERIES DATA AVAILABLE: Four three-ring binders located in the monitoring lawsuit record.

Popo Agie: 1987 - 1995, Recreation livestock permits issued; 87-88, Outfitter/guide use days; 1987 and 95, trailhead registrations.

Fitzpatrick: 1987, 93 and 95, trailhead registrations.

Washakie near Dubois: 1993 and 95, trailhead registrations.

North Absaroka and Washakie near Cody: 1987 through 1995, permitted horse-months; 1989-91, trailhead sampling (people and horse counts).

Wilderness use reports: 1986 through 1995.

ANALYSIS:

Recreation livestock users are required to obtain permits to enter the Popo Agie Wilderness. In 1987, about 5500 visitor days were recorded through these permits. The number increased to over 7200 visitor days in 1989, and declined from 6000 in 1990 to 5000 in 1994, and 4200 in 1995. Data is unavailable for 1991 and 1992. This data reflects a peak in use over the last decade between 1989 through 1990. Lower numbers in recent years could be interpreted as less recreation livestock use or inability to administer permits and lower compliance. Available data on outfitter guide use is incomplete and insufficient in this data set for making trend observations; in 1987, about 23,000 visitor days were recorded through actual use reports. Outfitter use reporting should be present in the special use monitoring item. Visitor use of trailhead registration boxes and Forest Service attention to this data source both appear to have declined greatly over the decade. About 16,000 visitor days were counted in 1987 and 2200 in 1995 for the Popo Agie.

At trailheads entering the Fitzpatrick Wilderness, about 500 visitor days were registered in 1987, with 8000 in both 1993 and 1995. Based on this data, use appears to have increased drastically in this wilderness.

At trailheads entering the Washakie Wilderness near Dubois, about 2100 visitor days were registered in 1993 and 1600 were registered in 1995. This data is insufficient to make any observations on trends.

In the North Absaroka and Washakie Wilderness near Cody, the numbers of permitted horse-months are available for 1987 through 1995. The conditions under which these permits were issued, and the link to wilderness use is too vague to make any trend observations. In 1989-91, trailhead samples of numbers of people and horses indicate greatly increased use over that time by a factor of about 10. Inconsistent sampling techniques and the short time period involved render this analysis inconclusive.

Wilderness use reports show annual increases in use from 1986 to 1990, and then a decline and levelling off from 1991 to 1995. Use in 1986 was reported at 140,000 visitor days, increasing to over 200,000 in 1989 and 1990, and declining to 188,000 in 1995. The basis for these reports is not supported by the data that

exists in our files today. Undocumented observations, assumptions made from trailhead counts, occasional sample counts, wilderness ranger observations of trail use, etc., have over the years been used to provide a sense of increasing or decreasing use on each unit. The increases or decreases have been applied as a percentage to the previous year's reported use figure.

It has been recognized internally for many years that our ability to provide an adequate estimate of the actual use in wilderness is severely limited. Also, our sampling over time has been too inconsistent to develop a suitable quantitative picture of trend. It is possible to develop an index measure, and to sample accordingly in order to do this. Leadership consistency, funding and personnel resources must be devoted specifically to the development and implementation of this type of sampling.

Wilderness Campsite Condition

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

TIME SERIES DATA AVAILABLE:

1987-1995 - Five three-ring binders located in the monitoring lawsuit record.

1996 - Wilderness campsite inventory binders located at each district office.

Between 1987 and 1995 a total of 333 wilderness campsites were inventoried. Of these, 93, or 28 percent, met or surpassed the desired Frissel class assigned to the area. The remaining 72 percent did not meet the Forest Plan standard. In 1996 approximately 27 percent of the campsites inventoried met or surpassed the desired Frissel class; 33 percent did not.

In the Popo Agie Wilderness, 117 campsites have been monitored. Fifteen, or 13 percent, of these met or exceeded the Frissel class. Eight percent of the Popo Agie campsites were monitored more than once during the 1987-95 period. Of these, half showed a slight improvement in condition. In 1996 approximately 35 percent of campsites were visually monitored with no significant changes noted that would increase or decrease their Frissel rating from previous years.

In the Fitzpatrick Wilderness, 117 campsites have been monitored. Eighteen, or 17 percent, of these met or exceeded the Frissel class. Two percent of the Fitzpatrick campsites were monitored more than once during the 1987-95 period. Of these, all showed a slight improvement in condition. In 1996, thirty to forty percent of campsites were visually monitored with no significant changes noted that would increase or decrease their Frissel rating from previous years.

In the Washakie Wilderness, the 1990 monitoring of 85 campsites revealed that 52 sites, or 61 percent, met or exceeded the desired Frissel class. In 1996, one additional campsite that was inventoried was rated below the Forest Plan standard for condition.

In the North Absaroka Wilderness, the 1995 monitoring of 14 campsites showed that 5 sites, or 36 percent, met or exceeded the desired Frissel class. In 1996, of the 11 campsites that were inventoried 27 percent met the Forest Plan standard for condition.

Forestwide, about 72 percent of the inventoried wilderness campsites are rated below the Forest Plan standard Frissel condition; i.e., they do not meet the desired condition. Twenty-six percent of the sites are within Frissel class 5, the worst class. Over time, some improvement was noted, although this improvement could be attributed to the clean-up and rehabilitation of sites following the inventory visit.

A high percentage of wilderness campsites have been inventoried and rated in the Popo Agie and Fitzpatrick Wildernesses. These campsites need to be revisited and monitored using the Modified Cole rating to quantify changes since they were first rated five to ten years ago. In the Washakie and North Absaroka wildernesses, less than fifty percent of the campsites have been inventoried and rated, so current condition for individual sites is not well established. The sampling in recent years indicates that campsite condition is generally below standard.

RECREATION TRENDS

Off-road Vehicle Use of Designated Travelways

DATA SOURCE: Citations, warning notices, ranger observations/notes/photos; inventoried ORV use areas and access points are the focal points for monitoring.

TIME SERIES DATA AVAILABLE:

1989 - Lander District (Washakie). Christina Lake 4WD road project: Project specifications, maps, annotated photos, descriptions of damage.
1990 - Lander District (Washakie). Public notice of ORV problems, Open House; ORV/Road inventory field notes and photos (narratives) primarily Loop Road locals.
1991 - Lander District (Washakie). ORV task force notes; ORV/Road inventory field notes and photos, maps.
1995 - Wind River District. Vehicle, people counts and observations for selected roads. Clarks Fork District, 2 NOV's and 10-15 Incident Reports issued for ORV use off roads.
1996 - Clarks Fork District, 7 NOV's and 40 Incident Reports issued.

There is too little quantitative data relating to off-road vehicle use on the Forest to perform a statistical analysis of the trend. Observation of new tracks on vegetation leaving existing roads, and an observed increase over the years of dirt two-track roads, indicates that this type of use is increasing. Observation also indicates a significant increase in people trailering ORVs or carrying them in their pickups or flatbed vehicles. Most communities nearby are experiencing increases in population and there seems to be a significant movement toward the use of motorized recreational vehicles for general recreation use and for hunting.

On the North Zone of the Forest, noticeable increases in ORV use were observed for the Bald Ridge, Fantan/Morrison Jeep Trail, Upper Sunlight, Carter Mountain, and Phelps Mountain/Jack Creek areas. If violation notices and incident reports are an index, use of ORVs off roads has more than doubled on the three northern districts since last year. Eighteen incidents were reported in the period between August 10 and November 24. Greybull District personnel noted an increase in the number of phone calls or complaints regarding the use of ATVs off roads or breaching gates on closed roads.

Observations indicate continued high levels of use on the South Zone in the Warm Springs and Union Pass areas in particular.

Observations also indicate that the use of snowmobiles on the Clarks Fork, Wind River, and Washakie districts is skyrocketing. The recent arrival of more powerful machines is marked by widespread playing over large expanses of snow-covered terrain, where tracks are evident throughout. "High-marking" is a current popular pursuit. People tend to leave the groomed trails where it is possible to, even though some trails are marked as "designated route" travel only. The incidence of snowmobile trespass in wilderness areas is increasing, but levels are relatively low at present.

Dispersed Campsite Condition

DATA SOURCE: Modified Cole Campsite/Used site condition inventory. Inventoried orv use areas and access points would be the focus for monitoring, regularly used off-road areas and road termini would be prioritized.

TIME SERIES DATA AVAILABLE:

1990 - North Zone, Greybull Ranger District. Campsite inventory forms, maps, and photos. Campsites not rated using Modified Cole Method.
1996 - Campsite condition ratings performed on Clarks Fork District. Sites inventoried on Wapiti District.

The use of dispersed campsites is directly related to increased use of ORVs and development of a new informal road system on the Forest. Please refer to the ORV Use section above. As with roads and ORV use, there is not enough quantified data associated with this item to allow comparisons with past years. Observations by field going personnel over the past ten years support the hypothesis that dispersed campsites are growing in number, and that newer sites are rapidly deteriorating with increased use. The inventories being designed at the present time will allow us to make better estimates of the numbers of dispersed sites. Campsite condition ratings performed in places this year will help us develop a baseline condition for comparison in future years.

Numerical ratings performed on the Clarks Fork and Wapiti Districts in 1996 indicate a range of campsite conditions from moderate to highly disturbed. None of the sites measured ranked at a low level of disturbance. Sites consistently had high levels of "development" and low levels of "cleanliness". Thirty-five percent of identified dispersed sites were rated for condition in 1996 on the two districts combined.

One difficulty in performing field analysis is that many dispersed campsites are located in grazing allotments in places that are desirable to cattle. It is difficult to rate some items, such as vegetation disturbance, and attribute them to recreation use by people or recreation livestock versus cows. As more condition data is collected in and out of allotment areas, we may be able to develop indices to separate the impacts of the two uses.

WATER QUALITY TRENDS

The trend analysis for this item is incorporated into the Monitoring and Evaluation Report under the heading Water Resources. Please see item 1. *Water Quality Trend: Effects of Specific Resource Management Practices on Water Yield/Quality; Verification of Models/Coefficients Used to Predict Effects in the Plan and the Set Threshold Levels.*

RIPARIAN TRENDS

Riparian Condition

The riparian ecosystem scorecard referred to in the Forest Plan was never finalized and implemented. Various methods and procedures have been used to estimate the amount of riparian and riparian condition on the Forest since then. Forest-wide riparian mapping was completed in 1994. The mapping delineated existing vegetation and land types within riparian areas in accordance with Integrated Resource Inventory guidelines. These guidelines provide consistency in riparian mapping. Data from the inventory is loaded on the Forest Geographic Information System (GIS). This information was also incorporated into the Forest Soil Resource Inventory mapping effort.

Information on riparian condition for the Forest range allotments was completed in 1989 and updated in 1992 for a General Accounting Office Report. Based on those reports which included some field verification, it appears that of the approximately 23,840 riparian acres on the Shoshone National Forest (including livestock allotments), about 45 percent are meeting desired condition, about 53 percent are moving towards desired condition and approximately 2 percent are not meeting nor moving towards desired condition.

Between 1995 and 1996, A Forest Interdisciplinary Team (IDT) drafted an Environmental Assessment for 36 Grazing allotments on the Shoshone National Forest. This EA addressed 36 of the 82 livestock grazing allotments on the Forest. The analysis indicates that past livestock grazing practices, from the late 1800s to the mid 1900s allowed for significantly higher livestock numbers which contributed to poor range conditions on some allotments. Since then, livestock numbers have decreased, range management as well as other forest management practices have improved and grazing allotments have been closed. Overall, riparian conditions on the allotments are improving, currently moving in an upward trend and towards desired conditions with some localized problem areas. Concurrently, other ungulate populations such as elk have increased. There is concern that current ungulate numbers in some areas may limit opportunities to improve riparian condition.

The recent Environmental Analysis and Decision Notice for the 36 Grazing Allotments outlines mitigation measures necessary to move riparian toward desired condition at a faster rate than is currently ocurring. If implemented, and if wildlife populations stay at current population objectives, riparian conditions should improve on those grazing allotments.

Overall, there are many more miles of riparian in good condition than of concern on the Forest. The Shoshone is currently focusing on riparian monitoring within areas of concern. Monitoring was conducted in riparian areas both in and outside range allotments beginning in 1994 and is reported on throughout this report.

TIMBER TRENDS

Restocking of Clearcuts

Restocking of clearcuts is monitored through regeneration surveys. Following is a table displaying acres of clearcuts surveyed for regeneration in the years 1989 through 1996.

Table 12. Acres of Clearcut, Regeneration Surveys and Acres Certified as Regenerated

Year	Clearcut	Regeneration Surveys	Certified as Regenerated
1989	0	57	19
1990	0	1,721	1,658
1991	0	1,194	0
1992	56	0	377
1993	0	542	328
1994	0	50	50
1995	0	1,014	11,190
1996	0	1,742	1,997
Totals	56	6,447	5,619

The majority of acres on the Shoshone that were clearcut, are from past treatments of Lodgepole Pine stands on the South Zone (Washakie and Wind River Districts) of the Forest. Clearcut acres surveyed during this time period are from clearcuts prior to the National Forest Management Act of 1976, when certification of regeneration was not required by law. However, the Forest has spent considerable time conducting regeneration surveys on these acres in order to update our records to reflect actual conditions on the ground. Of the 6,477 acres surveyed during this timeframe, 6,208 of those acres were clearcut before 1976. A total of 5,436 acres clearcut prior to 1976 were certified as regenerated. In conducting the monitoring for FY 96, and reviewing the data base and records, we discovered two sites totaling 8 acres that were clearcut after 1976 that were not previously accounted for in this monitoring item, (3 ac. were clearcut in 1988 on the on the Washakie District and 5 ac. were clearcut in 1982 on the Wind River District). These 8 acres will be surveyed in FY 1997.

The trend for certification has been sporadic over the past 8 years. In the last 2 years increased regeneration surveys have been conducted resulting in increased acres certified as stocked and meeting regeneration requirements. It should be noted that the acres that have not been certified have failed due to poor distribution of seedlings, not for lack of seedlings. It is thought that poor distribution of seedling on these acres is due to past management practices such as dozer piling of slash or broadcast burning of the sites. Since the majority of lodgepole pine on these sites are stocked with non-serotinous, open cone, trees, past management practices hampered tree establishment by piling and or burning seed from harvested trees. These sites are gradually filling in with seedlings resulting from seed blown in from adjacent stands and even from seeds produced by saplings from the first flush of regeneration.

Recent reviews of past surveys indicate that many sites not previously certified may be eligible to be certified today. Followup surveys in 1995 and 1996 have resulted in additional acres being certified. Additional surveys are scheduled for 1997.

APPENDIX B

FY 1997
MONITORING PLAN

SHOSHONE NATIONAL FOREST
MONITORING PLAN

Fiscal Year 1997

Introduction

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

The following monitoring plan represents the Forest's monitoring priorities for 1997. The monitoring plan assumes no interruptions to this year's program of work by activities such as a severe fire season, appeals or lawsuits, or other unforseen circumstances that would divert personnel and funds away from field work.

FOREST PLAN

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

RESPONSIBILITY: Forest Analyst and Budget & Finance Person
DUE DATE: March 2, 1998
DATA SOURCE: Program Accounting and Management Attainment Reporting System
FUNDING/PERSONNEL: 5 person days, GS-7 and 2 person days, GS-11

RECREATION

MONITORING REQUIREMENT: Off-road Vehicle Use of Designated Travelways
RESPONSIBILITY: Public Service Team
DUE DATE: March 2, 1998
DATA SOURCE: Citations, warning notices, ranger observations/notes/photos; inventoried orv use areas and access points would be the focus for monitoring, regularly used off-road areas would be prioritized.
FUNDING/PERSONNEL: .5 person year for Forest, GS-4-7s; and 2 person days, GS-11

MONITORING REQUIREMENT: Trail Condition
RESPONSIBILITY: Public Service Team
DUE DATE: March 2, 1998
DATA SOURCE: Project Trail Inspections, trail segment monitoring forms
FUNDING/PERSONNEL: .5 person year for Forest, GS-4-7s; and 2 person days, GS-11

MONITORING REQUIREMENT: Dispersed Campsite Condition
RESPONSIBILITY: Public Service Team
DUE DATE: March 2, 1998
DATA SOURCE: Modified Cole Campsite/Use site condition inventory. Inventoried orv use areas and access points would be the focus for monitoring, regularly used off-road areas and road termini would be prioritized.
FUNDING/PERSONNEL: .5 person year for Forest, GS-4-7s; and 2 person days, GS-11

MONITORING REQUIREMENT: Developed Site Use
RESPONSIBILITY: Public Service Team
DUE DATE: March 2, 1998
DATA SOURCE: Annual RIM Report, MAR Reports, Concessionaire Income Reports
FUNDING/PERSONNEL: 10 person days, GS-4-7s, 4 person days GS-9

MONITORING REQUIREMENT: Developed Site Condition
RESPONSIBILITY: Public Service Team
DUE DATE: March 2, 1998
DATA SOURCE: Inspection, concessionaire site inspection reports, MAR report.
FUNDING/PERSONNEL: 10 person days, GS-4-7s, 4 person days, GS-9.

MONITORING REQUIREMENT: Downhill Skiing Use
RESPONSIBILITY: Jennifer Watson
DUE DATE: March 2, 1998
DATA SOURCE: Permittee supplied use statistics, resort inspections
FUNDING/PERSONNEL: 7 person days for Forest, GS-7, 2 person days, GS 11.

MONITORING REQUIREMENT: Trail Construction/Reconstruction
RESPONSIBILITY: Zone, Public Service Team.
DUE DATE: March 2, 1998
DATA SOURCE: MAR Reports
FUNDING/PERSONNEL: 4 person days, WG 7, 1 person day, GS 9.

WILDERNESS

MONITORING REQUIREMENT: Wilderness Campsite Condition
RESPONSIBILITY: Public Service Team
DUE DATE: March 2, 1998
DATA SOURCE: Modified Cole Campsite/Used site condition inventory.
FUNDING/PERSONNEL: .5 person year for Forest, GS-4-7s; and 2 person days, GS-11

VISUALS

MONITORING REQUIREMENT:

RESPONSIBILITY: Landscape Architect/Districts
DUE DATE: March 2, 1998
DATA SOURCE: Management Reviews
FUNDING/PERSONNEL: 25 person days for Buffalo Bill Highway/GS9, 5 days for the rest of the forest.

THREATENED, ENDANGERED AND SENSITIVE SPECIES

MONITORING REQUIREMENT: Grizzly Bear Mortalities
RESPONSIBILITY: Forest Supervisor, Grizzly Bear/Wolf Center of Excellence
DUE DATE: March 2, 1998
DATA SOURCE: Interagency Grizzly Bear Study Team and Montana Fish, Wildlife and Parks annual reports.
FUNDING/PERSONNEL: 2 days GS-12 (Approximately $500)

MONITORING REQUIREMENT: Compliance with Interagency Grizzly Bear Guidelines
RESPONSIBILITY: Forest Supervisor, District Rangers, team leaders, project biologists, Grizzly Bear/Wolf Center of Excellence. Grizzly Bear/Wolf Center of Excellence will take the lead.
DUE DATE: March 2, 1998
DATA SOURCE: Project Biological Assessments and consultation with U.S. Fish and Wildlife Service, grizzly bear compliance patrol reports, law enforcement reports, IGBC grizzly bear conflict annual report.
FUNDING/PERSONNEL: Above noted personnel and district compliance personnel (approximately $20,000).

MONITORING REQUIREMENT: Grizzly Bear Habitat Effectiveness
RESPONSIBILITY: Forest Supervisor, Grizzly Bear/Wolf Center of Excellence
DUE DATE: March 2, 1998
DATA SOURCE: Grizzly Bear Cumulative Effects Model (CEM) and the IGBC access analysis process. (NOTE: Completion of this monitoring item is dependant on the following. CEM was run on the Forest in 1996 and model validation and testing is in process. CEM will be run again on the Forest as soon as model testing is completed for the Ecosystem. Databases used in the CEM analysis will be updated for any changes in 1997. Development of the access analysis process is underway and a baseline report will be generated once the process for completing the analysis is finalized.)
FUNDING/PERSONNEL: District biologists, district recreation staff, GIS Coordinator, engineering staff, timber staff, Grizzly Bear/Wolf Center of Excellence (Approximately $15,000).

MONITORING REQUIREMENT: Wolf Population Status
RESPONSIBILITY: Grizzly Bear/Wolf Center of Excellence
DUE DATE: March 2, 1998
DATA SOURCE: Weekly Gray Wolf Recovery Progress Report from U.S. Fish and Wildlife Service, reports received from Forest Service Employees and the general public.

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

MONITORING REQUIREMENT: Inventory of nesting Peregrine Falcons to include number of sites used, number nesting pairs, nesting success, and production.
RESPONSIBILITY: Forest Wildlife Biologist
DUE DATE: March 2, 1998
DATA SOURCE: Report from WGFD as a part of CCS agreement # 11214109410
FUNDING/PERSONNEL: 60 person days plus helicopter time - $7,000 total project cost - Forest share = $3,500 as a part of project mgmt code 2611.

WILDLIFE AND FISH

MONITORING REQUIREMENT: Sensitive Species survey work including the water vole lynx, wolverine, boreal owl, dwarf shrew, and goshawk.
RESPONSIBILITY: Forest Wildlife Biologist
DUE DATE: March 2, 1998
DATA SOURCES: Report from WGFD as a part of CCS agreement # 11214109410
FUNDING/PERSONNEL: Total project cost estimate = $40,000 - Forest share = $20,000 as a part of project mgmt code 2611.

MONITORING REQUIREMENT: Wildlife Habitat Improvements - Forest Plan item
RESPONSIBILITY: Forest Wildlife Biologist
DUE DATE: March 2, 1998
DATA SOURCES: Information assembled for annual MAR Report
FUNDING/PERSONNEL: 1 person day GS-12

MONITORING REQUIREMENT: Winter Range Carrying Capacity - Forest Plan item
RESPONSIBILITY: Forest Wildlife Biologist
DUE DATE: March 2, 1998
DATA SOURCE: Data sheets from seasonal Range and Wildlife Crew
FUNDING/PERSONNEL: 2 GS-5 seasonals - total project cost estimate = $9,000.

MONITORING REQUIREMENT: Riparian Condition
RESPONSIBILITY: Forestwide Riparian Coordinator
DUE DATE: March 2, 1998
DATA SOURCE: Riparian, watershed, aquatic habitat, range, and wildlife field data collected on key monitoring areas/sites including functioning riparian, stream morphology, key aquatic habitat parameters, browse utilization, production-utilization transects, stubble height transects, photo points and other approved methods found in the Region 2 Analysis Handbook.
FUNDING/PERSONNEL: Forest-wide approximately 500 days GS-5 (a 4 person watershed crew and 2 person range crew); 137 days GS-7,9,11,12 (60 days range staff + 40 days GS-11 Aquatic Biologist + 22 days GS-12 Hydrologist + 5 days Gs-9 Hydrologist + 10 days GS-12 Wildlife Biologist). Other miscellaneous riparian monitoring = 20 days (10 days GS-12 Hydrologist and 10 days Aquatic Biologist).

RANGE

MONITORING REQUIREMENT: Livestock Forage Utilization
RESPONSIBILITY: Zone Range Conservationist
DUE DATE: March 2, 1998
DATA SOURCE: Range field data, collected on key monitoring areas/sites: production-utilization transects, stubble height transects, ocular estimation, photo points, other approved methods found in the Region 2 Range Analysis Handbook.
FUNDING/PERSONNEL: Forest wide: 60 days, GS-5; 60 person days GS-7,9,11.

MONITORING REQUIREMENT: Long Term Range Condition and Trend
RESPONSIBILITY: Zone Range Conservationist
DUE DATE: March 2, 1998
DATA SOURCE: Range field data, collected on key monitoring areas/sites: Re-read "Parker" trend transects and overlay cover frequency transects. Nested frequency transects on critical sites, photo points on less critical sites. Other approved methods found in the Region 2 Range Analysis Handbook.
FUNDING/PERSONNEL: Forest wide: 30 days, GS-5; 30 person days GS-7,9,11.

MONITORING REQUIREMENT: Range Forage Development
RESPONSIBILITY: Zone Range Conservationist
DUE DATE: March 2, 1998
DATA SOURCE: Range field data, collected on allotments with earlier on dates and/or years of unseasonable weather. Use of photo point and "Range Readiness Form".
FUNDING/PERSONNEL: Forest wide: 50 person days GS-7,9,11.

MONITORING REQUIREMENT: Grazing Permit/Allotment Management Plan Compliance
RESPONSIBILITY: Zone Range Conservationist
DUE DATE: March 2, 1998
DATA SOURCE: Formal and informal meeting notes, Annual Grazing Instruction Meeting notes, Billing Records, Allotment Inspection notes. Livestock counts.
FUNDING/PERSONNEL: Forest wide: 30 days, GS-7/9 (billing); 90 person days GS-7,9,11 for meetings and inspections.

MONITORING REQUIREMENT: Noxious Weeds
RESPONSIBILITY: Zone Range Conservationist
DUE DATE: March 2, 1998
DATA SOURCE: Observation documentation. Reports from County Weed and Pest Districts.
FUNDING/PERSONNEL: Forest wide: 30 person days GS-7,9,11; $10,000 for contract work with County Weed and Pest Districts.

TIMBER

MONITORING REQUIREMENT: Allowable Sale Quantity
RESPONSIBILITY: Rangers and Forest Timber Staff.
DUE DATE: March 2, 1998
DATA SOURCE: MAR Report
FUNDING/PERSONNEL: Timber Zone Personnel, Forest Timber Staff, TCE personnel in Laramie. Personnel estimate is 50 days at a cost of $8,000.00.

MONITORING REQUIREMENT: Restocking of Clearcuts
RESPONSIBILITY: District Rangers, Forest Silviculturists, Timber Staff
DUE DATE: March 2, 1998
DATA SOURCE: Regeneration Surveys and Stand Exams
FUNDING/PERSONNEL: 20 person days, $4,000.00

MONITORING REQUIREMENT: Timber Stand Improvement
RESPONSIBILITY: Zone Timber Personnel, Contracting Officers and Inspectors
DUE DATE: March 2, 1998
DATA SOURCE: MAR Report, Field inspection reports, daily diaries, RMRIS
FUNDING/PERSONNEL: 40 person days, $6,000.00

MONITORING REQUIREMENT: Growth Response
RESPONSIBILITY: Zone Timber Personnel, Forest Timber Staff
DUE DATE: March 2, 1998
DATA SOURCE: Stage II data, regeneration survival surveys, MAR reports, RIS data base.
FUNDING/PERSONNEL: 50 person days, $8,000.00

MONITORING REQUIREMENT: Size of Clearcuts
RESPONSIBILITY: Zone Timber Personnel, District Rangers, Timber Staff Officer
DUE DATE: March 2, 1998
DATA SOURCE: Silvicultural Prescription, Timber Sale Packages, RIS Data Base
FUNDING/PERSONNEL: 10 person days, $2,000.00

MONITORING REQUIREMENT: Openings Created by Management Activities
RESPONSIBILITY: Timber Staff, IL Teams, Permit or Contract Administrators
DUE DATE: March 2, 1998
DATA SOURCE: NEPA documents, contracts
FUNDING/PERSONNEL: 20 person days, $4,000.00

MONITORING REQUIREMENT: Lands Not Suited for Timber Production
RESPONSIBILITY: Zone Timber Personnel, Forest Timber Staff, District Rangers
DUE DATE: March 2, 1998
DATA SOURCE: NEPA Documents, Contracts, RIS data base
FUNDING/PERSONNEL: 30 person days, $6,000.00

MONITORING REQUIREMENT: Air Quality
RESPONSIBILITY: Scott Maki
DUE DATE: March 2, 1998
DATA SOURCE: Air Quality Related Values (AQRV) Wilderness Lake Sampling. Parameters sampled are water quality, macroinvertebrates, and zooplankton. Also sampling vegetation and soils in one watershed for MAGIC computer model.
FUNDING/PERSONNEL: Program Cost $17,500.

MONITORING REQUIREMENT: Air Quality

RESPONSIBILITY: Scott Maki
DUE DATE: March 2, 1998
DATA SOURCE: Air Quality Related Values (AQRV) Wilderness Lake Sampling, Synoptic Survey of low alkalinity lakes. Samples to be collected by the National Outdoor Leadership School (NOLS), under the direction of the Forest Service
FUNDING/PERSONNEL: Cost to Forest Service: $1,000; NOLS will be paying the major portion of the cost including personnel and lab fees.