Idaho Panhandle National Forests

FOREST PLAN

MONITORING AND EVALUATION REPORT

2000

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I. INTRODUCTION

The monitoring and evaluation process compares the end results that have been achieved to the projections made in the Forest Plan. Costs, outputs, and environmental effects, both experienced and projected, are considered. This process comprises a management control system, which provides information to the decision maker and the public on the progress of implementing the Forest Plan. Monitoring is designed to gather data necessary for the evaluation. During evaluation, date provided through the monitoring effort are analyzed, interpreted, and then used to determine if the implementation of the Forest Plan is within the bounds of the plan. Annual reports have been prepared from FY 1988 through FY 1999.

The Forest Plan identifies 22 monitoring and evaluation items. (See Appendix A for requirements.) It requires that 12 items be reported every year, one be reported every 2 years, and 9 others be reported every 5 years. All 22 items were reported in FY 1998; the 12 annual items plus one biannual item are included in this year's report. These are:

A-1	Outputs of Goods and Services
A-2	Effects on and of National Forest Management
B-6	Actual Sell Area and Volume
C-1	Visual Quality
D-1	Off-Road Vehicles
E-1	Cultural Resources
F-2	Grizzly Bear Recovery
F-3	Caribou Recovery
G-2	Water Quality
G-4	Fish Population Trend
H-1	Threatened and Endangered Plants
I-1	Minerals
K-1	Prescriptions and Effects on Land Productivity

This report also includes information on a number of topics not required by the Forest Plan but important to forest management. These subjects are: ecosystem restoration; inventoried roadless areas; old growth; Canada lynx, peregrine falcon, elk; whitebark pine; and fire.

II. SUMMARY OF FINDINGS

A few of the key findings are briefly summarized below. For more detailed discussions the reader should consult the section that discusses that monitoring item in the main part of the report.

- The Forest Plan established an average annual allowable sale quantity (ASQ) of 280 million board feet (MMBF) for the first decade after the plan was adopted. This was to occur on an estimated 18,688 acres annually. The Plan specified that the ASQ could increase to 350 MMBF in the second decade. The actual amount of timber sold has been much lower than anticipated in the Plan. In FY 2000, 76.3 MMBF was offered, 78.2 MMBF was sold, and 90 MMBF was harvested. The number of acres sold was 7,332. Payments to counties in FY 2000 totaled $3,991,166.

- In 1998 the Canada Lynx was proposed for listing under the Endangered Species Act. In 1999 a Draft Conservation Assessment and Strategy was completed for this species. Also in 1999, hair snares were set up at 348 locations on the IPNF to detect lynx. Twenty-seven hair samples were sent to a lab for DNA analysis to determine if any of them were from lynx. The results show the hair samples were contaminated and the data was found to be invalid. Samples will be taken again in the summer of 2001 and data analyzed in the winter.

- The grizzly bear population on the IPNF is estimated to be stable to increasing slightly. The most significant limiting factor for recovery of grizzly bear populations is direct mortality from people, especially shooting of bears, during hunting season.

- The population trend for woodland caribou is down, presently estimated at 35 animals. Predation is believed to be the most significant limiting factor for caribou at this time.

- In FY 2000, 37 projects were monitored for compliance with Forest Plan visual quality objectives. All were in compliance.

- Harvest units were sampled as part of our soil quality monitoring. One of the units sampled met Forest Plan standards for compaction, displacement, and fine organic matter, and another one did not. One of the units sampled did not meet the recommended guidelines for coarse woody debris.

- The Forest reported (and the State Historic Preservation Office reviewed) six timber sale projects. Most of these sale areas were previously inventoried and required only an analysis of the effects of the proposed timber sales on known heritage resources. It was determined that all of these proposed timber sales would have no effect on heritage resources.

- The USFWS has determined that habitat exists on the Idaho Panhandle for Silene spaldingii (Spalding's catchfly.) In the spring of 2000, Botanists developed a process to predict potential habitat (e.g. grasslands) utilizing the SILC (Satellite Imagery Land-cover Classification) data. Broad-scale and project level surveys were conducted during the field season of 2000 to validate predicted habitat and search for populations. No populations of Spalding's catchfly have been found to date on the Forest.

- Forest monitoring of Best Management Practices (BMP) indicates that in most cases they functioned as expected and met their intent. Feedback from monitoring was used to adjust certain BMP's. Updated information is also provided on some projects described in previous monitoring reports.

- The Forest continued eight of its long-term water quality monitoring stations. During Water Year (WY) 2000 the data from Cat Spur Creek was analyzed and compared to that predicted from the WATSED model. The findings indicate that the WATSED measured responses were accurate for flow response, but appeared to over estimate sediment loads. Further investigations of the landtypes involved in the study watershed will be made, and recalibration will follow if necessary.

- We are continuing to look for opportunities to use funds from a variety of sources to restore ecosystems. Examples of Forest ecosystem restoration work for FY 2000 are listed below. See the Ecosystem Restoration section of this report for more details.
    - Planting approximately 507,900 rust resistant white pine seedlings.
    - Planting approximately 2,918 acres of white pine, larch and ponderosa pine. These are species that are in short supply on the IPNF.
    - Reducing stocking by thinning 3,977 acres; most of this released larch, white pine and ponderosa pine.
    - Restoring the role of fire in the Forest's ecosystems by 11,077 acres of prescribed burning.
    - Improving 1,028 acres of soil and water resources.
    - Obliterating 114.8 miles of roads.

- Forest Plan standards call for us to maintain 231,000 acres of old growth (10% of our forested acres). We have identified and allocated 250,776 acres (10.9% of our forested acres) to be retained as old growth. We have an additional 24,123 acres (1% of our forested acres) of field verified unallocated old growth, which provides old growth habitat for wildlife and serves other ecological functions.

- Table 1 is a quantitative summary of some of the Forest's other accomplishments for FY 2000.

Some of the monitoring items discussed in this report are major topics to be addressed during forest plan revision. Idaho Panhandle and Kootenai National Forests have formed a Forest Plan revision zone to undertake the process.

III. MONITORING ITEMS

This section contains the monitoring and evaluation results for FY 2000 for each of the twelve monitoring items discussed in this year's report.

Forest Plan Monitoring Item A-1: Outputs of Goods and Services

Table 1. Quantitative Estimates of Performance Outputs and Services

Outputs and Services	Quantitative Estimates
Budget	$35,029,367
Total number of employees	486 (permanent and temporary)
Volume of timber offered	76.3 million board feet
Volume of timber sold	78.2 million board feet
Volume of timber harvested	90 million board feet
Total acres of timber sold	7,332 acres
Total receipts	$15,248,319
Payments to counties	$3,991,166
Total reforestation completed	3,170 acres
Total number of seedlings planted	1,216,700
Timber stand improvement completed	3,977 acres
Soil and water improvement completed	1,028 acres
Roads maintained	2,672 miles
Roads constructed	2.3 miles
Roads reconstructed	373 miles
Roads obliterated	114.8 miles
Trails constructed/reconstructed	39.7 miles
Number of wildfires	157 fires
Acres burned by wildfire	2,762 acres
Harvest related fuel treatment	3,275 acres
Hazardous fuels reduction	7,802 acres
Wildlife habitat restored	73 acres
Wildlife habitat inventoried	NA
TES terrestrial habitat restored	0 acres
TES structures constructed	1 structure
TES terrestrial habitat inventoried	NA
TES stream habitat inventoried	NA
Noxious weeds treated	7,090 acres
Grazing allotments administered	5
Rangeland Monitored/Evaluated	1,000 acres
Abandoned mines reclaimed	18

Forest Plan Monitoring Item A-2: Effects on and of National Forest Management

The first part of this monitoring item "Effects of Other Government Agencies on the IPNF" has proven to be very difficult to quantitatively measure and for this reason has been reported infrequently. The second part of this item "The Effects of National Forest Management on Adjacent Land and Communities" has been reported most frequently using data on payments to counties. In this year's report we present information for two areas: payments to counties and Forest Service employment. Both of these economically impact adjacent communities.

A. Payments to Counties

Background

The Forest Service pays out 25 percent of its annual revenues collected from timber sales, grazing, recreation, minerals, and land uses to states in which national forest lands are located. The amount a county receives depends upon the amount of these activities that occur there and the amount of national forest land within it.

The major source of revenue on the Idaho Panhandle National Forests is timber sales. Payments to counties depend on the amount of timber that is harvested during the past year. Table 2 compares payments to counties with harvested timber volume.

Monitoring Data

Table 2. Payments to Counties with Harvested Timber Volume

Fiscal Year	Payments (MM$)	Volume (MMBF)
1991	5.4	232
1992	7.4	235
1993	6.0	134
1994	6.4	117
1995	5.8	87
1996	6.0	81
1997	3.9	57
1998	4.8	85
1999	3.1	75
2000	4.0	90

Table 3. Distribution of Payments to Counties

County	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Benewah	65,777	71,747	78,926	60,217	60,294	56,152	45,610	31,051	9,243	17,227
Bonner	830,257	1,229,474	823,120	929,071	966,681	880,735	491,055	761,712	732,841	953,000
Boundary	895,881	1,330,307	885,433	1,003,376	1,060,285	954,333	529,089	823,583	816,527	1,067,089
Clearwater	6,869	7,492	8,242	7,130	6,929	6,452	5,257	3,579	1,065	2,035
Kootenai	645,371	905,926	689,921	826,323	619,058	800,937	492,483	696,058	363,068	393,721
Latah	31,787	34,672	38,141	32,853	31,908	29,716	24,212	16,483	4,906	9,373
Lincoln, MT	41,692	61,909	41,192	46,624	49,267	44,186	24,498	38,160	37,707	49,278
Pend Oreille, WA	223,327	333,409	221,838	251,092	265,328	237,964	131,936	205,511	203,071	265,386
Sanders, MT	11,879	17,640	11,737	13,285	14,038	12,590	6,980	10,873	10,744	14,041
Shoshone	2,783,740	3,423,283	3,180,350	3,213,263	2,758,792	3,011,686	2,148,684	2,171,037	943,124	1,220,016
Total	**5,536,580**	**7,415,859**	**5,978,900**	**6,383,234**	**5,832,580**	**6,034,751**	**3,899,804**	**4,758,048**	**3,122,296**	**3,991,166**

Evaluation: Table 3 depicts how receipts have been distributed to counties for the past 10 years. There are seven counties in Idaho, two in Montana, and one in Washington that receive payments from IPNF activities. The base for the 25 percent payment to states by the IPNF for FY 2000 was collection of $15,248,318.73. Timber volume harvested in FY 2000 was 90 million board feet, increased from 58 million board feet in FY 1999. Receipts to counties in FY 2000 totaled $3,991,166, an increase of $868,870 from FY 1999.

The receipts to counties over the past 10 years have varied from a high of $7.4 million to a low of $3.1 million. The loss in revenue to the counties for roads and school funds has not been as proportional as the fall down in timber volumes from a high of 280 million board feet to a low of 57 million board feet because of the increase in the value of the timber during this same period.

B. Forest Service Employment

Background

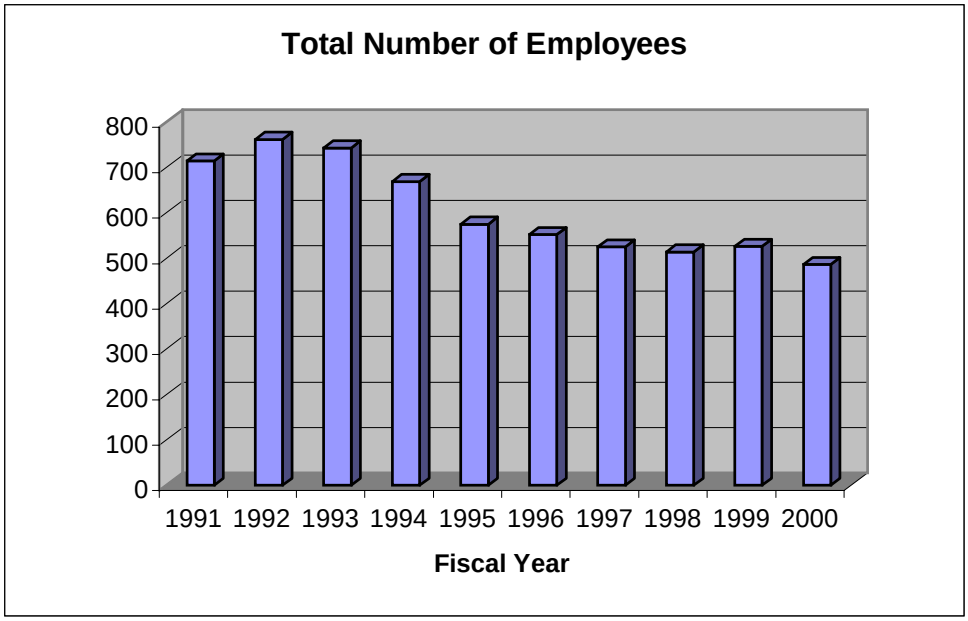
The people who work for the Idaho Panhandle National Forests spend money and contribute to the economy of the communities in which they live. As Forest Service employment goes up and down the amount of money contributed to the local economy also varies.

Monitoring Data

Table 4. Total Number of Employees

Fiscal Year	Employees
1991	714
1992	762
1993	743
1994	669
1995	575
1996	552
1997	525
1998	514
1999	526
2000	486

Figure 1. Total Number of Employees



Evaluation: Table 4 and Figure 1 show the way our workforce has changed from 1991 to 2000. We went from a high of 762 permanent and temporary employees in FY 1992, to 486 at the end of FY 2000. This loss of employment has had a greater effect on the smaller communities such as Bonners Ferry, Wallace and St. Maries than on communities like Coeur d'Alene and Sandpoint where significant population growth has occurred during the same time period.

Forest Plan Monitoring Item B-6: Actual Sell Area and Volume

The purpose of this item is to monitor the actual amount of timber sold and the amount of acres associated with the volume sold.

Background

The allowable sale quantity (ASQ) is the quantity of timber that may be sold from the area of suitable land covered by the Forest Plan for a time period specified by the plan. This quantity is usually expressed on an annual basis as the "average annual allowable sale quantity".

The 1987 IPNF Forest Plan established an average annual allowable sale quantity of 280 million board feet (MMBF) for the first decade the plan was in effect. This was to occur on an estimated 18,688 acres annually. The Forest Plan said that depending on future conditions, the ASQ could increase to 350 million board feet a year for the second decade timber harvest level.

The Forest Plan identified a threshold of concern for ASQ when accomplishments fall below 75-percent of the desired volume and acres (below 210 MMBF and 14,016 acres).

Monitoring Data

FY 2000: For this fiscal year the Idaho Panhandle National Forests offered 76.3 million board feet of timber for sale. We sold 78.2 million board feet.

FY 1991-2000: Table 5 depicts timber volumes offered and sold, and sale acreages for the past 10 years. Figure 2 that follows it graphically presents trends in volumes offered and sold. Figure 3 shows total acres sold.

Table 5. Timber Volumes Offered and Sold (MMBF) and Total Acres Sold

Fiscal Year	Volume Offered	Volume Sold	Total Acres Sold
1991	201.6	163.2	13,989
1992	127.2	108.0	10,508
1993	109.4	124.3	13,939
1994	44.9	16.4	4,283
1995	64.1	37.5	8,437
1996	75.4	42.9	8,631
1997	79.3	108.3	10,914
1998	76.3	90.3	6,974
1999	63.4	30.3	8,751
2000	76.3	78.2	7,332

Figure 2. Timber Volume Offered and Sold

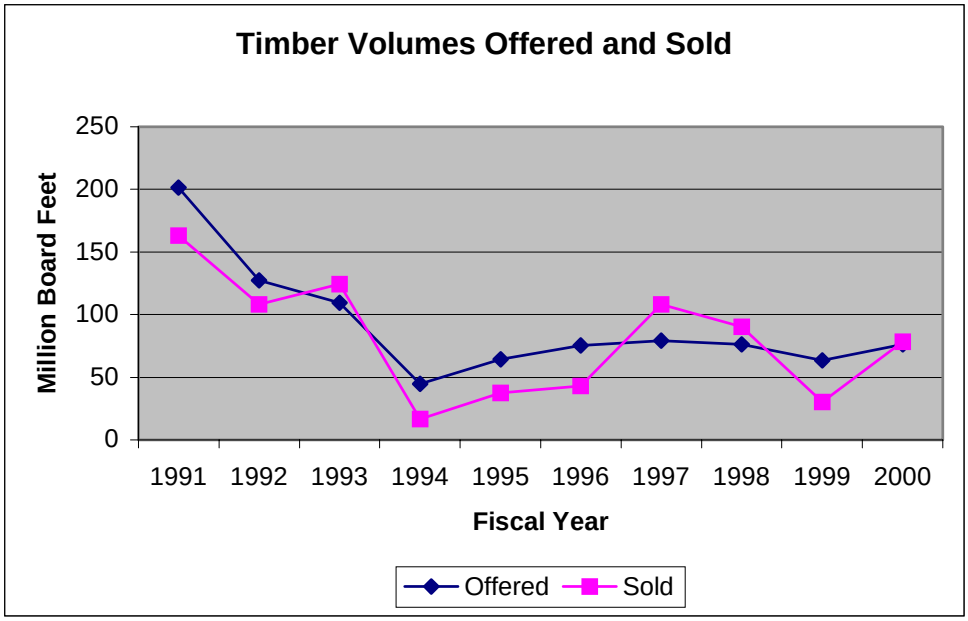
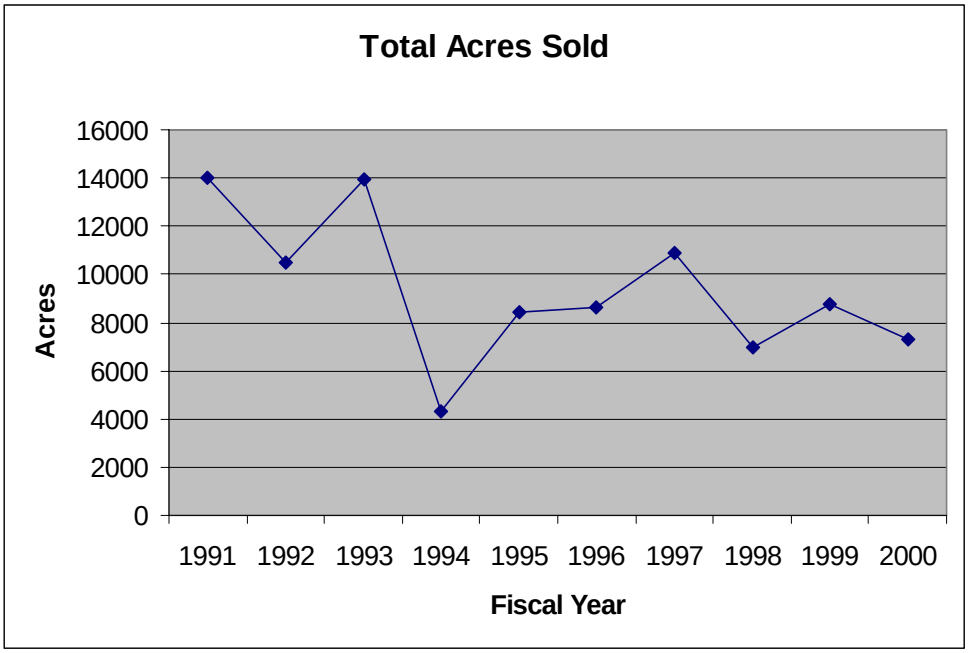


Figure 3. Total Acres Sold



Timber volume offered figures are from the STARS reporting system and old accomplishment reports. Timber volume sold figures are from the Timber Sale Accounting system (TSA.)

Evaluation

For FY 1988 through 1990 the volume of timber sold and acres sold exceeded the 75-percent threshold identified in the Plan. From FY 1991 through 2000 volume sold and acres sold has fallen below that threshold.

There are many reasons why the amount of timber harvested has dropped below the 75-percent threshold. Some of these include: movement away from clearcutting to partial cuts which means harvesting produces less volume per acre, inventoried roadless areas have not been largely entered, protection of existing and replacement old growth, implementation of INFISH direction, downsizing of IPNF workforce, budget changes, complexity of NEPA analysis and process, protection of Threatened and Endangered Species habitat, and water quality concerns.

The amount of timber to be harvested from the IPNF will be one of the topics addressed during Forest Plan Revision.

Forest Plan Monitoring Item C-1: Visual Quality

Background

Federally owned and managed lands provide the settings for a vast spectrum of recreational experiences desired by the public. To ensure the reported 860 million annual visits to national forests meet expectations, careful planning and management is required. Recreational opportunities are comprised of three major components: the activity, the setting, and the experience. The Recreational Opportunity Spectrum is used as framework for stratifying and defining outdoor recreation opportunity environments. The Idaho Panhandle National Forests (IPNF) Forest Plan of 1987 spells out the Visual Quality Objectives (VQOs) acceptable in the various opportunity settings offered on the forests. These VQOs are an important management tool for forest managers to ensure availability of a vast array of opportunity settings expected by the diverse recreating public. Any humanly imposed change made to the forest environment must meet certain criteria ensure attainment of the meeting of the objectives established in the Forest Plan. Meeting VQOs on an annual basis helps to ensure variety, health and sustainability of the land.

Monitoring Data

Forest Plan Monitoring Item C-1: Achieving Visual Quality. Determine if project activities implemented Forest Plan visual quality objectives.

Frequency of measurement: Annual

Threshold: A 10% departure from Forest Plan direction after five years initiates further evaluation.

Table 6. Timber Sales Sold

Timber Sale Name	Should the sale meet the Forest Plan VQO's?
Priest Lake R.D.	
No sales reported	
Bonners Ferry R.D.	
Kat Tail II	Yes
McFee Line	Yes
Old Koot	Yes
Rock Pine	Yes

Sandpoint R.D.	
None	
Central Zone	
Canfield Ice	Yes
Steam Boat Salvage	Yes
Spion Kop	Yes
Freeze Out	Yes
South Zone	
Avery Hill Hazard Retention	Yes

Table 7. Timber Sales Closed

Timber Sale Name	VQOs Met	Remarks
Priest Lake		
Reed In	Yes	Commercial thin and salvage harvesting.
Nordman	Yes	Commercial thin harvesting.
OJ1 Byway Bugs	Yes	Commercial thin harvesting.
Snow Latola	Yes	Blowdown salvage.
Snow Bead II	Yes	Understory removal and blowdown salvage.
P Ref HQ	Yes	
Bonners Ferry		
Can Hall	Yes	Commercial thin and salvage harvesting.
EBGB	Yes	Commercial thin harvest.
HeliRockter	Yes	Enhancement selection harvest.
Kat Tail	Yes	Commercial thin harvest.
Moyie Face	Yes	Regeneration, salvage, group selection harvests.
Rocky Road	Yes	Irregular shelterwood harvest.
Smith Helicopter	Yes	Salvage harvest.
Tungengroove #1	Yes	Commercial thin.
Sandpoint R.D.		
Antelope	Yes	Selection harvest.
Lassen	Yes	Salvage harvest.
Sundance Missed	Yes	
Sundown Salvage	Yes	Salvage harvest.

Jeru Blowdown	Yes	Salvage harvest.
Upper Cedar	Yes	
Central Zone		
Beetles I	Pending	Selection harvest. Underburn pending.
Horizon	Pending	Selection harvest. Underburn pending.
Paul Bunyan	Yes	Small scattered, salvage harvest.
Montgomery	Yes	Small scattered, salvage harvest.
I90 Heli	Yes	Small scattered, salvage harvest.
Big Shot Salvage	Yes	Small scattered, salvage harvest.
Buckskin Salvage	Yes	Small scattered, salvage harvest.
Cougar Salvage	Yes	Small scattered, salvage harvest.
Deer Forks Ice	Yes	Small scattered, salvage harvest.
High Horse	Yes	Small scattered, salvage harvest.
Pining Pines	Yes	Small scattered, salvage harvest.
Happy Hog	Yes	Small scattered, salvage harvest.
South Zone		
East High	Yes	Slash harvest.
Keel Haul 3A	N/A	Road access request from Potlatch, ROW decks.
Keel Haul 4A	N/A	Road access request from Potlatch, ROW decks.
In Between Salvage	Yes	Provides buffer along road #1451 for wildlife concerns.
Fuzzy Creek Helicopter	Yes	

The majority of FY 2000 timber sales units were harvested using partial cut treatments. VQOs were met with all completed projects. Thinning and salvage operations were designed to improved the existing situations where imminent concerns for forest health and hazards existed. The FY 2000 monitoring data shows harvest methods continue to be trending away from clearcuts to shelterwood and salvage harvest.

Distribution of harvest methods on the IPNF in the nine-year-period, from FY 1992 through 2000 is depicted in the following chart, " Harvesting Methods 1992-2000". Since inception of the Forest Plan in 1987, the trend has been away from visually impactive methods towards the use of more visually sensitive methods of timber harvest.

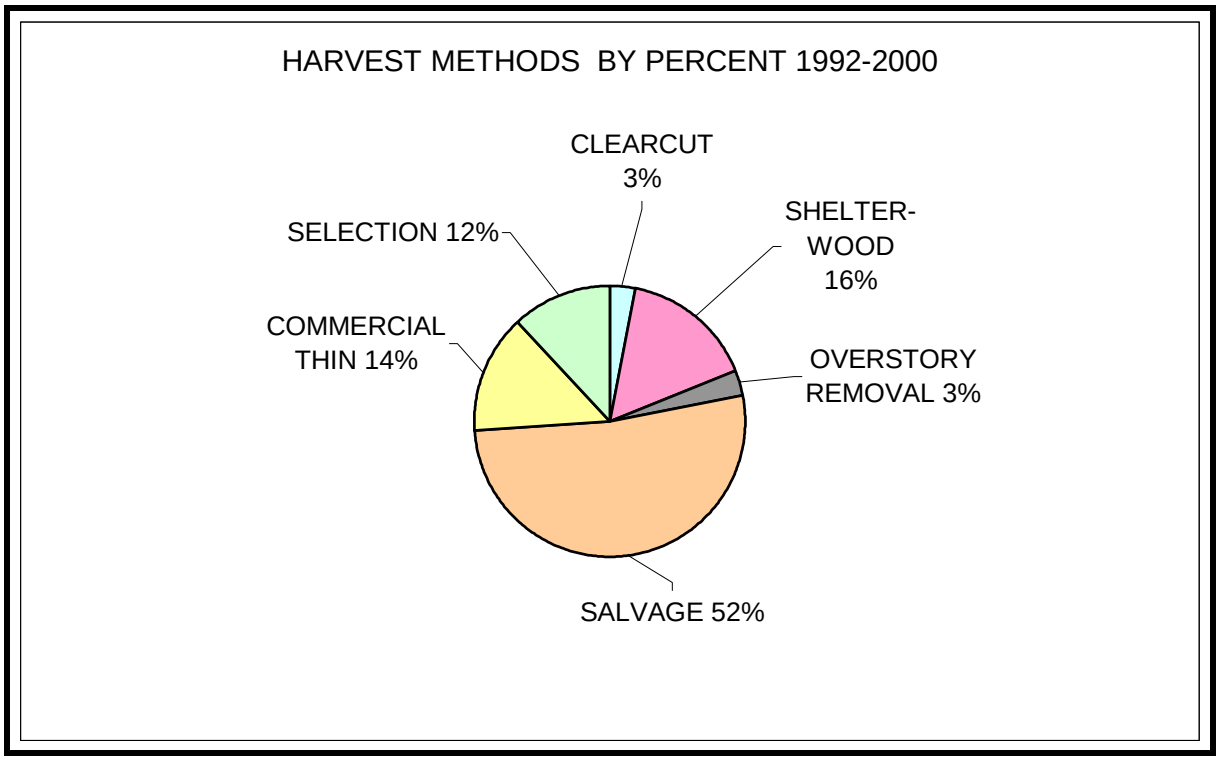
Approximately 80,000 acres were harvested between FY 1992 and 2000. Only 3% of those acres were clearcut. No clearcut harvesting has been done on the IPNF since 1997. The rising percentage of Salvage harvest acres, up from 44% in FY 1999 to 53% in 2000 trends the IPNF toward more natural appearing landscapes characterized by variety of color, form and texture.

Shelterwood harvests show a trend downward from 19% of acres to 16% of total harvested acres in the last nine years. This harvest method rarely achieves any degree of aesthetic variety.

No Selection harvests were done in FY 2000. This brought the percent of total Selection harvest acres down from 14% to 12% of harvested acres in the last nine years. The periodic removal of trees in 10-20 year intervals typically results in high visual quality.

No Commercial thinning was done in FY 2000 on the IPNF. Commercial thinning is typically visually neutral.

Figure 4. Harvest Methods Used



(Total harvested acres: 79,488)

Forest Plan Monitoring Item D-1: Off-Road Vehicles

Background

The purpose of this monitoring item is to determine the impacts of off-road vehicles on resources or other resource users. It is also to determine if Forest Travel Plan direction is being followed.

Monitoring Data

The principal sources of information for this monitoring item is the number of violations issued by Forest Service Law Enforcement Officers that are associated with off-road vehicle use. Listed below is the number of citations issued for FY 1991-2000.

Table 8. Total Number of Citations Issued

Fiscal Year	Number of Citations
1991	144
1992	167
1993	204
1994	185
1995	88
1996	133
1997	240
1998	246
1999	394
2000	164

Evaluation

Eight different types of off-road vehicle violations are commonly noted. Examples of these include damaging roads, trails, or gates; operating vehicles in a manner that endangers any person or property, or use which damages or unreasonably disturbs the land, wildlife or vegetative resources; or the use which is in violation of State law or published Orders.

Some violations by off-road vehicle users occur when no Forest Service personnel are around to witness them. For this reason the number of citations is not an accurate measure of the amount of violations or resource impacts. It can however be used as a general indicator of trends in violations and law enforcement activities associated with off-road vehicles.

During FY 2000, 164 citations were issued. This is a decrease of 230 citations over the 394 issued in FY 1999. The reason for the large decrease in the number of citations issued in FY 2000 is not known. Future data will help show whether this decrease in FY 2000 is a trend or an anomaly.

Forest Plan Monitoring Item E-1: Heritage Resources

Background

The purpose of this monitoring item is to insure that projects do not cause adverse effects to heritage resources. The threshold of concern is any unmitigated adverse impact. The Idaho Panhandle National Forests monitors land disturbing projects to identify potential impacts to heritage resources.

Monitoring Data

Timber Sales—The Forest reported (and the State Historic Preservation Office reviewed) six timber sale projects. Most of these sale areas were previously inventoried and required only an analysis of the effects of the proposed timber sales on known heritage resources. It was determined that all of these proposed timber sales would have no effect on heritage resources.

Facilities—The Forest identified structural problems with the porch on the Old Avery Ranger Station bunkhouse, which is listed on the National Register of Historic Places. In May and June 2000, the Region One Historic Preservation Team assisted the Forest in repairing the porch and identifying additional log work that will be completed in FY 2002.

A Passport In Time volunteer project continued restoration of the Red Ives Ranger Station, which is also listed on the National Register of Historic Places. The work completed in FY 2000 included tree pruning, painting and step repairs.

Trails—The Forest began construction of the "Route of the Hiawatha" Rail Trail in 1997. The FY 2000 work included continuing the repair of the concrete liner in the St. Paul Pass Tunnel as well as installation of interpretive sign stands and toilets. In FY 2001 the interpretive signs will be completed and installed, final work on the St. Paul Pass Tunnel will be completed and work will begin on inspecting the earth fill embankments.

Mining—The Forest continues to close abandoned mines that are considered a danger to the public. The Forest heritage staff monitors closure proposals to insure that there is no adverse effect to heritage resources.

Special Use Permits—An existing outfitters camp inventoried in FY 1999 was reexamined. The project was found to have no impacts to heritage resources.

An additional proposed outfitters camp was examined at Bedrock Creek on the St. Joe District in FY 2000 to determine if there will be any impacts to heritage resources and no impacts were noted at this location.

Recreation—A proposed toilet installation at Priest Lake was found to potentially impact a prehistoric site. Initial test excavations in FY 1999 identified the prehistoric site. Further test excavations, mapping and other studies undertaken in early summer 2000 determined a location for the toilet that will have no adverse effect on the identified heritage sites.

Forest Plan Monitoring Item F-2 Grizzly Bear Recovery

Background

Habitat for grizzly bears is measured annually in fifteen grizzly bear management units (BMUs) in the Selkirk and Cabinet-Yaak Ecosystems. Each BMU except Lakeshore is approximately 100 square miles, the average home range of a female grizzly bear with cubs. The Forest Plan required that each BMU maintains at least 70 square miles of secure habitat for grizzly bears. The following tables show that six BMUs met this standard in FY 2000. Since the Forest Plan was adopted, additional guidelines have been developed by the Interagency Grizzly Bear Committee. These are:

* Percent core (areas free of motorized access)
* Square miles of security
* Percent of security
* Percent of a BMU with open road density greater than one mile per square mile, (open roads are those with no restrictions on motorized vehicle use.)
* Percent of a BMU with total road density greater than two miles per square mile

Monitoring Data

The Northwest Peaks and Keno BMUs are partly on the Idaho Panhandle National Forests and partly on the Kootenai National Forest. There were several forest fires in these BMUs in FY 2000, mostly on the Kootenai National Forest. Some of the roads which are normally closed to provide habitat security for gizzly bears were temporarily opened for emergency firefighting efforts. During the emergency, grizzly bear security was temporarily reduced. Reductions in grizzly bear habitat security are permitted for emergencies such as fire control. After the fires, the roads were closed again. The numbers shown in the table below show the post-fire habitat security.

Table 9. Grizzly Bear Habitat Status

2000 BMU	Acres	Square Miles	Acres Core	% Core	Acres Security (Total)	Sq. Miles Security	% Security	Open Road Density >1mi/sqmi (%BMU)	Total Road Density >2 mi/sqmi (%BMU)
Goal =				**≥55**		**≥70**	**≥70**	**≤33**	**≤26**
Ball-Trout	57,907	90	43,049	74	49,345	77	85	16	9
Blue-Grass	57,325	90	28,118	49	40,843	64	71	30	29
Boulder	62,368	97	30,239	48	43,617	68	70	37	35
Grouse	66,979	105	27,651	41	40,457	63	60	45	41
Kalispell-Granite	85,641	134	39,657	46	60,633	95	71	31	29
Lakeshore	17,967	28	2,881	16	4,818	8	27	82	56
Long-Smith	65,733	103	48,203	73	53,866	84	82	21	13
Myrtle	63,781	100	38,272	60	45,287	71	71	31	19
North Lightning	65,216	102	39,713	61	45,279	71	69	38	20
Scotchman	61,612	96	38,848	63	42,973	67	70	35	27
Shared BMUs, Not Calculated by IPNF:									
Salmo-Priest	87,115	136	55,754	64	65,336	102	75	30	24
Sullivan-Hughes	78,210	122	43,016	55	58,658	92	75	20	23
Northwest Peaks	18,588	29	no data	56	no data	no data	75	28	26
Keno	23,054	36	no data	59	no data	no data	72	35	24
LeClerc	77,176	121	25,468	33	47,077	74	61	24	49

As the following table shows, the only BMUs which met security, core and road density standards and guidelines in FY 2000 were: Ball-Trout, Long-Smith, Myrtle, Salmo-Priest and Sullivan-Hughes. The other BMUs did not meet one or more management criteria for grizzly bears.

Table 10. Core, Security, Road Density Standards and Guidelines

	% Core	Square Miles of Security	% Security	% of BMU with open road density > 1 mi. per sq. mi.	% of area with total road density > 2 mi. per sq.mi.
Goal =	**55% or more**	**70 or more**	**70% or more**	**< or = 33%**	**< or = 26%**
Selkirk BMUs					
Ball-Trout	meets	meets	meets	meets	meets
Blue-Grass	does not meet	does not meet	meets	meets	does not meet
Kalispell - Granite	does not meet	meets	meets	meets	does not meet
Lakeshore	does not meet	N/A	does not meet	does not meet	does not meet
LeClerc	does not meet	no data	does not meet	meets	does not meet
Long-Smith	meets	meets	meets	meets	meets
Myrtle	meets	meets	meets	meets	meets
Salmo-Priest	meets	meets	meets	meets	meets
Sullivan – Hughes	meets	meets	meets	meets	meets
Cabinet-Yaak BMUs					
Boulder	does not meet	does not meet	meets	does not meet	does not meet
Grouse	does not meet	does not meet	does not meet	does not meet	does not meet
Keno	meets	N/A	meets	does not meet	meets
North Lightning	meets	meets	does not meet	does not meet	meets
Northwest Peaks	meets	N/A	meets	meets	meets
Scotchman	meets	does not meet	meets	does not meet	does not meet

Forest Plan Monitoring Item F-3 Caribou Recovery

The purpose of this monitoring item is to monitor population changes of caribou and effectiveness of their habitat to determine if recovery objectives outlined in the Woodland Caribou Recovery Plan are being met (U.S. Fish and Wildlife Service, 1994.)

Background

The Selkirk caribou population was listed as endangered in 1983. The recovery area for the population is the Selkirk Mountains of northern Idaho, northeastern Washington and southern British Columbia. Management for the recovery of caribou in the Selkirk Mountains includes monitoring populations and habitat conditions.

This caribou population is generally found above 4000 feet elevation in the Selkirk Mountains in Engelmann spruce/subalpine fir and western red cedar/western hemlock forest types. In both the Kootenai River Basin and the Priest Lake Basin, caribou occasionally are found as low as the valley bottom. Caribou are adapted to boreal forests and do not occur in drier, low elevation habitats except as rare transients. Seasonal movements are complex in this population, which frequently crosses the U.S. / Canada international border. Earlier this century, caribou occurred as far south as Lewiston, Idaho; now they are restricted in the lower 48 states to the northern portion of the IPNF and northeastern Washington.

The caribou population is threatened by illegal killing, predation, habitat alteration from timber harvest and fires, roadkill, and possibly displacement by snowmobiles. It has been speculated that past timber harvesting in and adjacent to caribou habitat has increased habitat fragmentation beyond historic levels and has resulted in an increase in white-tailed deer in caribou habitat. As deer populations increased, so have mountain lions, resulting in more predation on caribou by mountain lions. Predation and limited amounts of early winter habitat are believed to be the most significant limiting factors for caribou at this time.

Monitoring Data

The official population estimate for this herd for FY 2000 is 35 caribou. This is a decrease from an estimate of 49 caribou in FY 1999. The Forest encompasses 174,760 acres of woodland caribou habitat. There were no changes in caribou habitat. In FY 2000, 23,300 acres of caribou habitat were monitored.

Evaluation

Appendix N of the Idaho Panhandle National Forests Forest Plan listed specific habitat management guidelines for caribou. New scientific data on how caribou use their habitat has resulted in a revised habitat analysis procedure. This effort along with continued research on caribou habitat preferences has indicated that the Forest Plan's five seasonal

habitats are not distinct, but rather overlap in several seasons. Analysis thus far continues to support the assumption that early winter habitat in "target" condition is an important and possibly limiting factor for caribou recovery.

The Forest Plan defined target conditions for each of five seasonal caribou habitats. Achieving these target conditions is a long-term process that can be accomplished through manipulation of vegetation or natural succession. In addition, the Forest Service will continue to implement recommendations of the caribou steering committee and recovery teams; support Idaho Department of Fish and Game and Washington Department of Fish and Wildlife in winter caribou censuses and monitoring radio collared caribou; and research on predation and other factors that are preventing the recovery of this species.

Forest Plan Monitoring Item G-2: Water Quality

Item G-2 describes the monitoring efforts that check and evaluate the implementation and effectiveness of forest management activities on watersheds, water resources, and their beneficial uses within the Forest. Practices include Best Management Practices (BMP) monitoring, which cover implementation and effectiveness monitoring of activities that took place in 1999, and follow-up monitoring of activities identified in previous monitoring reports. Follow-up monitoring is highlighted in bold print in Table 12. All of the projects listed in Table 12 are brief summaries. Detailed reports are available at the district offices.

The objectives of BMP monitoring are to check that BMPs are applied and implemented as designed (implementation monitoring), that they are effective in controlling non-point sources of pollution (effectiveness monitoring), and are protecting water quality and beneficial uses as intended (validation monitoring).

Since the watershed simulation program, WATSED, was used to help assess watershed responses to various alternatives, and continues to be used in project planning as one of the many tools to assist managers and watershed specialists evaluate potential response and evaluate alternatives; G-2 also requires ongoing validation checks and calibration adjustments as necessary. These checks have been taking place since the Plan was released; and they continued in (Water Year) WY2000 by comparing the instream monitoring record in Cat Spur Creek with a WATSED simulation.

Cat Spur Creek is a tributary to the Middle Fork of the Saint Maries River on the Saint Joe River Ranger District. It is a 12 square mile watershed, half of which is managed by the Forest, and half is BLM, State, and privately held. The drainage is dominated by highly erosive and often unstable border zone geology (gneiss and schist), and with alluvial deposits in its lower valleys. The watershed has a long and intense development history. The road network is extensive and logging is a primary use.

A recording stream gage was established in 1987 near the watershed mouth. Suspended sediment and water temperature have been collected since then until the station was discontinued at the end of WY1997. Bedload was collected for several years.

A comparison of the measured data and the WATSED simulations for the same years follow:

Table 11. Comparison of measured sediment & flow information at Cat Spur Creek and WATSED simulation for the watershed above the recording station.

		WATSED Sediment	MEASURED Sediment	WATSED Runoff	MEASURED Runoff	WATSED Runoff	MEASURED Runoff
				peak month Q	peak month Q (cfs)	Duration	Duration
	T/mi^2/yr	T/yr	T/yr	(cfs)	(cfs)	time > 75% Qp (days)	time > 75% Qp (days)
"natural"	15.7	188		38.5		71	
area (mi2)	12						
1987		293		39	20	41	30
1988		293		39	21	41	29
1989		293	65	39	48	40	32
1990		300	115	39	46	40	51
1991		329	180	39	41	40	28
1992		328	179	39	29	40	32
1993		312	189	39	43	39	49
1994		305	118	39	18	39	32
1995		302	208	39	52	39	35
1996		285	235	39	40	39	28
1997		290	297	39	52	39	27
	averages	305	176	39	39	40	34
	per mile^2	25.4	14.7	3.2	3.2		

Comparison of the information collected and generated indicates:

1. Peak flow magnitudes and changes are consistent;

2. The expected duration of peak flows is simulated substantially greater than that was measured. This is probably related to the base flow duration curves that were used in the model, which was the Saint Maries River. The larger river is not likely a good representative of the hydrologic regime in the upper tributaries, including Cat Spur. The simulations will be adjusted and rerun with a more appropriate base hydrograph.

3. Sediment yield appears to be estimated at almost twice that that was measured. Since the unit yields of 25 tons per square mile per year that were simulated are more in the range of documented yields in the landtypes involved in the watershed, it is expected that the measured sediment is more likely at issue. This assumption is reinforced by the fact that bedload, a substantial component from border-zone landforms, was not consistently collected at this gage. Therefore, the monitoring strategy has been modified to make up for the inconsistencies in past

bedload measurements. Additionally, the exceptionally large component of non-national forest lands and management in Cat Spur Creek makes it likely that the disturbance history and details (silviculture, site preparation, logging systems, road specifications, etc.) may be inadequate to provide simulations effective enough for calibration and validation efforts. Therefore, an alternate monitored watershed will be used for future calibration work.

Table 12. Best Management Practices Monitoring

Location	Summary of Activities	Summary of Findings
North Zone Priest Lake District, Priest River Experimental Forest Salvage BMP Monitoring	**Effectiveness**: New culvert installation on Spur Road 597-01. Silt fence was installed as planned but was not sufficient to prevent sediment transport.	Hydrologist observed sediment transport down channel for at least 300 feet because silt fence was filled and topped over. Solution: install multiple silt traps rather than relying on just one.
North Zone Priest Lake District, Priest River Experimental Forest Salvage BMP Monitoring	**Effectiveness:** Sediment basins were constructed on Road 597-C.	Sediment basins were efficiently trapping sediment. Staff at PREF will maintain the structure for at least a couple of years.
North Zone Priest Lake District, Priest River Experimental Forest Salvage BMP Monitoring	**Effectiveness:** There were a number of culvert catch basins that were over steepened and eroding. Exposed soils should have been seeded and mulched but was not included in road package for this sale.	Problem was brought to attention of the project lead engineer, who immediately had the contractor stabilize the sites.
North Zone Priest Lake District, Priest River Experimental Forest Salvage BMP Monitoring	**Effectiveness:** Survey team reviewed the skid trails in sale area and noted that many of them were not seeded or otherwise stabilized.	Problem may be remedied after sale is closed.
North Zone Priest Lake District, Priest River Experimental Forest Salvage BMP Monitoring	**Implementation:** Buffer strip boundaries on sale appeared to be properly marked and timber harvesters were following where the boundaries were.	Project was verified to be implemented as designed.
North Zone Priest Lake District, Priest River Experimental Forest Salvage BMP Monitoring	**Implementation:** Road reconstruction – from what logging had taken place, it appeared that the logging practices were good and following state guidelines as well as federal standards.	Project was verified to be implemented as designed.
North Zone Priest Lake District, Dusty Peak Timber Sale BMP Review	**Effectiveness:** In June 2000, district hydrologist reviewed 2 roads (1112 and 1112A) in Packer Creek proposed for use. 1112 was closed earlier under Kalispell Granite Bear Mgt. Access Plan.	Existing pipes undersized, road not draining properly, some sections of ditch lines were plugged. Recent logging resulted in exposed and eroded cut banks from skidding. There was no apparent effort to stabilize the sites by the loggers. Sites need to be mulched, seeded and fertilized to prevent further erosion.
North Zone **Priest Lake District, Road Closure and Improvements Monitoring**	**Effectiveness: Road 1122 closed as part of district bear management access plan in 1996. Initial EIS stated that roads would receive some level of maintenance.**	**Maintenance is *NOT* taking place. Some sites are failing and contributing sediment to the NF Granite Creek.**

Project Location	Summary of Activities	Summary of Findings
North Zone **Priest Lake District** **Road Closure and Improvements Monitoring funded by Knutsen-Vandenberg Plans, Lower Quartz Timber Sale.**	**Effectiveness: Road 334G was obliterated in 1997.**	**The revegetation efforts were 85% successful, though ATV traffic caused erosion at the site of a pulled culvert and minimized the effectiveness of cross-drains on this road.**
North Zone **Priest Lake District** **Road Closure and Improvements Monitoring funded by Knutsen-Vandenberg Plans, West Moores Timber Sale**	**Effectiveness: Road 2291A was treated in 1998 to reduce erosion. Road has historically had a problem with recreational truck traffic deeply rutting road prism.**	**Road was heavily rutted and guardrail was down. Two options are available: make sure that guardrail is in place during critical times and locate funding to put rock on the existing road to prevent future erosion.**
North Zone **Priest Lake District** **Road Closure and Improvements Monitoring funded by Knutsen-Vandenberg Plans, Castro Timber Sale**	**Effectiveness: Roads 984B, C, E, and 320 were closed to vehicles to protect water resources. Work was accomplished in 1997.**	**Review in 2000 showed that roads were on average 90% revegetated and earthen barriers were effective with no apparent erosion off of the roads.**
North Zone Priest Lake District Road Closure and Improvements Monitoring funded by Knutsen-Vandenberg Plans, Hathaway Timber Sale	**Effectiveness:** Road 1098C was obliterated. Roads 1098B and 1336C were treated to minimize the risk of failure while still leaving most of the road prism in tact for future access.	Grass was halting surface erosion on Road 1098C but not enough fill was removed during initial work and some sediment has entered creek. Site is self-stabilizing and no additional work is needed. 1098B and 1336C are stable and well vegetated. If roads were to remain closed, pipes will have to be removed to meet Idaho forest practices.
North Zone Priest Lake District Road Closure and Improvements Monitoring funded by Knutsen-Vandenberg Plans, Ponderosa Connection Timber Sale	Effectiveness: **Road 219 was reviewed. Road is located on highly weathered granitic soils. Road was seeded, fertilized and mulched in 1999 to help stabilize raw banks.**	At time of survey, very little vegetation was established on the banks. A follow-up treatment of seed, fertilizer and mulch would improve the site.
North Zone **Priest Lake District** **Road Closure and Improvements Monitoring funded by Knutsen-Vandenberg Plans, SF Granite Timber Sale**	**Effectiveness: Roads 1382A, B, and C were closed by purchaser in 1996 and Road 1382D was closed by USFS in 1992.**	**Roads closed by purchaser were not showing signs of erosion, though crew noted a lack of water bars. Road closed in 1992 was very stable. Planted trees are thriving and erosion mats are effective at preventing down cutting.**

Project Location	Summary of Activities	Summary of Findings
North Zone **Priest Lake District** **Road Closure and Improvements Monitoring funded by Knutsen-Vandenberg Plans, Ojibway Timber Sale**	**Effectiveness: Road 318J was obliterated in 1998. Roads 318F, G and H were treated with water bars and seeded in 1998, left open and drivable.**	**Obliterated road was well vegetated and effective. Surface erosion on active road was very minimal or non-existent. Some follow-up treatment of seed and fertilizer is recommended on active roads.**
North Zone **Priest Lake District** **Road Closure and Improvements Monitoring funded by Knutsen-Vandenberg Plans, Grassy Top Timber Sale**	**Effectiveness: Roads 302B, C, and 1122B were obliterated in 1997 to protect water resources and improve wildlife habitat.**	**Surveyors noted that water bars were not adequately installed, the ditch line was not intercepted and in some instances the fills were not adequately removed. Seasoned personnel should administer projects such as this one when obliterating roads located in glacial outwash.**
North Zone Priest Lake District Road Closure and Improvements Monitoring funded by 10% Fund, Road 2249, Distillery Bay	**Implementation/Effectiveness:** Obliteration started in 1999 but ran over budget before completion. Equipment for this project was too small, instream structures should have been installed by machine rather than by hand, not enough organic debris, inspector should have had a reviewer not involved with project so mistakes might have been corrected, exposed soils needed more fertilizer, lowest point in crossing did not get pulled enough.	A review in 2000 showed that slopes of the banks were not laid back enough, only 2 gradient control structures out of 5 were still functioning. General consensus was that it would have been better to have the structures installed by machinery. If not by machine, much care should be taken when installing structures by hand and these gradient control structures be deeply embedded into the stream bank.
North Zone Priest Lake District Willow Planting for Site Stabilization	**Effectiveness:** Objective of willow planting is to determine if and where willows can be used successfully for site stabilization. Over the years, willow planting was reviewed in several locations throughout the district. Sites reviewed in 2000 were Grassy Top and South Fork Gold Timber Sales.	In all locations, it appears that willows only thrive in locations that maintain relatively moist soil conditions throughout the year. The 2000 review showed similar results in that willows planted in the wetter slopes have measurably improved success over willows planted on seasonably drier sites.
North Zone Priest Lake District Road Construction Best Management Practices, Road 312	**Implementation/Effectiveness:** Relocation of road .3 miles was addressed in Douglas Fir Bark Beetle FEIS. Road was located adjacent to Upper West Branch Priest River. Relocation began in summer of 2000 and ended in the fall.	Relocated segment was very well constructed, culverts were well placed, appeared to be no drainage problems. Catch basin needed more stabilization, which was accomplished. Some problems with cattle encroachment affecting recovery of site. Relocation of road was a benefit to the river in allowing it to reclaim its floodplain.
North Zone Priest Lake District Timber Sale Best Management Practices, Application of INFISH buffer strips along stream courses within Douglas Fir Bark Beetle Project Area	**Implementation:** A commitment was made to field verify that INFISH buffer strips were identified and protected. A watershed/fish crew was directed to verify that prescribed buffers were marked as designed in the EIS.	Out of the 8 timber sales that were surveyed, there was just one sale with an ephemeral draw not having a 75-foot buffer that the FEIS required. The problem was brought to the attention of the lead forester and the problem was immediately solved.

Project Location	Summary of Activities	Summary of Findings
North Zone Priest Lake District Road Maintenance Best Management Practices, District-Wide	**Implementation/Effectiveness:** Road surveys throughout the district in preparation for the Douglas Fir Bark Beetle projects documented numerous occasions where system roads were not maintained properly. Many of the reports documented plugged pipes and/or blocked ditch lines.	Reasons for lack of road maintenance varied, however, cleaning culverts was one major practice that was not carried out. The district hydrologist made several programmatic suggestions that include: 1) close roads that will no longer be needed, 2) request additional dollars for road maintenance, 3) contract out basic road maintenance work, 4) strengthen the understanding of all field going personnel about the importance of taking the time to clean culverts, 5) continue to work with road maintenance staff on techniques to improve construction of water bars and basic culvert maintenance.
North Zone Priest Lake District Road Construction Best Management Practices for Road 305	**Effectiveness:** In 1999 the Bonner County Road Dept. relocated a segment of road that had failed in the spring of 1997. Road was located on USFS lands and the USFS providing technical assistance for the project. In 2000, district hydrologist reviewed BMPs used for the project. Several of BMPs that were functioning during time of project in 1999 were no longer functioning.	District hydrologist made the following observations: 1) Straw bales need to be removed and sediment needs to be removed from the ditch lines, 2) ditch needs to be rocked to prevent further down cutting, 3) Gradient of ditch line needs to be improved to prevent super saturation, 4) Road oblit. section is stable, well-grassed and no vehicles are breaching closure, 5) relief pipe is blocked at inlet and eroding at the outlet. Problem can be remedied by constructing a catch basin at the outlet to prevent further sediment movement.
North Zone Priest Lake District Road Construction Best Management Practices for Road 416	**Implementation:** Project involved both USFS and Corps of Engineers removing and relocating .6 miles of road. Project was supposed to start in 1999 but was delayed because of budget delays. It was completed in the fall of 2000.	Project was verified to be implemented as designed. District hydrologist made suggestions that would streamline a project of this nature by limiting number of individuals who were assigned to project, the engineers and contractors coordinating earlier in the planning process, keeping the same contact person available for both contractor and agency, have an assigned note taker present at site meetings keeping those not present up to date on decision making, and encourage a large meeting at beginning and end of process where everyone even remotely involved in project could participate.

Project Location	Summary of Activities	Summary of Findings
North Zone **Priest Lake District** **Grass Seeding Effects on Control of Noxious Weeds, District-Wide**	**Effectiveness: Objective of monitoring is to determine if historical grass seeding reduced the rate of invasion of noxious weeds. Over the past 12 years, a large number of roads were seeded for erosion control.**	**Review of these roads showed that noxious weed populations are much lower on the seeded roads than on roads that were not seeded.**
North Zone Sandpoint District Middle Mountain Timber Sale	**Effectiveness:** District monitored road drainage and skid trails on 969 Road systems in sale area.	Current drainage is not effective in preventing surface erosion on skid trails accessing cutting unit. The rest of road has low risk for erosion due to gentle grades. Construction of water bars and rolling dips will improve road drainage.
North Zone Sandpoint District Derr Point KV Monitoring	**Effectiveness**: District reviewed condition of Road 1021E. Road is gated and Kelly humped, has good grass cover, is in-sloped with a ditch and culverts are functioning properly.	Existing road drainage and erosion control measures appear to be effective in reducing potential erosion from roads. Stream channels do not appear to be extending into draws in the clear cuts.
North Zone Sandpoint District Gold Yeller Timber Sale KV Plan	**Pre-Implementation:** District reviewed the need for grade control structures in tributaries to West Gold Creek. 6 tributaries were reviewed.	Stream channels are relatively stable. No obvious downcutting is occurring and bedload sediment does not appear to be elevated. Channels do not appear to be extending into ephemeral draws. No headwater gradient control structures are necessary to maintain the integrity of these headwater streams to West Gold Creek.
North Zone **Bonners Ferry District** **Timber Sale Best Management Practices Review** **Thin Skin Timber Sale**	**Effectiveness: Sale was one of the first sales implemented under INFISH standards. Alternate access to some private land was created in 1998, which allowed the USFS to obliterate a high-risk section (.5 miles) of road.**	**On inspection, road and harvesting standards were properly applied with the exception of Unit 34, which was located within the 300 foot RHCA of Skin Creek. Hydrologist notified sale administrator who moved the unit boundary to correct the buffer distance.**
North Zone Bonners Ferry District Timber Sale Best Management Practices Review Thin Skin Timber Sale	**Effectiveness:** Part of decision from environmental assessment was to upgrade crossing on the main stem by removing two 48-inch culverts and replacing with a large bottomless arch culvert to reduce sediment risk downstream and reestablish fish passage.	Flooding during the winter of 1998 caused some major head cutting in and near the new culvert. Other than putting a mitered cut on the inlet and shoring up the cement footers near the inlet, no work was done in 1999. The channel did not change appreciably during the 2000 spring runoff.
North Zone Priest Lake District Road Reconstruction and Best Management Practices for Road 639C	**Implementation:** District hydrologist reviewed road reconstruction in August 2000. Previously, road had numerous seeps, failing ditch lines, undersized pipes, and mud holes in road prism.	Review showed that project was verified to be implemented as designed. Throughout project, it is apparent that engineer and contractor worked together to minimize soil disturbance.

Project Location	Summary of Activities	Summary of Findings
North Zone Bonners Ferry District Timber Sale Best Management Practices Review Kattail Timber sale	**Implementation:** Unit 1 was logged with a mechanical harvester and log forwarder.	Trailing density used was very high and 3 feet wider than the standard 12 feet used for traditional skidders. Soil monitoring was conducted and documented by the Forest Soil Scientist monitoring report. Some of the unit was more open than anticipated because of the high trail spacing.
North Zone Bonners Ferry District Timber Sale Best Management Practices Review Katka Peak Timber Sale	**Implementation:** A landing within the INFISH buffer near McGinty Creek was identified in the 1999 monitoring report as needing rehabilitation once it was burned. Landing was burned in October of 2000.	Landing will be evaluated by the district hydrologist and rehabilitated by seeding, covered with straw, and planted with trees.
North Zone **Bonners Ferry District Evaluation of Stream Structures in Kriest Creek**	**Effectiveness: Description of restoration work done for project is contained in the 1996 monitoring report. Description of sediment loading in creek is contained in the 1999 monitoring report.**	**Summer 2000 review showed that 7 of the compromised but still functioning instream structures had begun to fail. Mode of failure was headcutting through the v-notch structures. Structures were repaired to reduce potential for further headcutting and to reduce the potential for the structures to create additional scour.**
North Zone Bonners Ferry District Evaluation of Stream Structures in Skin Creek	**Effectiveness:** Purpose of structures was to control the gradient of a weak link reach and to dissipate the energy against the stream banks, and also to create pool habitat for fish. Structures were constructed in 1999.	Review indicated that all of the structures are fully achieving the objectives. Some structures created scour pools for fish habitat during low flows, but most lacked adequate cover, which was not designated into the structures. Cover may be added to the structures in 2001.
North Zone Bonners Ferry District Evaluation of Kriest Creek Road Obliteration	**Effectiveness:** Objectives were to eliminate artificial sediment risk attributable to through fills at stream crossings, unstable cut and fill slopes and the concentration and rerouting of water by the road to naturally unstable slopes.	Monitoring showed that objectives were met. Natural gradients, widths, and contours at stream crossings were implemented as designed and were effective during the spring 2000 runoff.
North Zone **Bonners Ferry District Evaluation of Pinochle Road 2624 Obliteration**	**Effectiveness: Road was obliterated in July of 1998. Objectives were to eliminate artificial sediment risk attributable to through fills, at stream crossings, unstable cut and fill slopes and the concentration and rerouting of water by the road to unstable slopes.**	**Monitoring shows that objectives were met with the exception of two relief pipes that were not removed. Re-contoured stream crossings are in excellent condition and the rock gradient control at the inlets and outlets are functioning as designed.**
North Zone Bonners Ferry District Evaluation of Cobble Creek Restoration	**Effectiveness:** project involved re-contouring a large, failed crossing on Road 2446. Objective was remove remaining sediment risk associated with crossing through fill.	Site review showed that restored crossing was functioning as designed. Site will be monitored next year towards the end of the grazing season to determine the level of use caused by cattle and if grazing is preventing or retarding vegetative recovery.

Project Location	Summary of Activities	Summary of Findings
North Zone Bonners Ferry District Evaluation of Beaver Creek Road Restoration	**Effectiveness: Project is described in the 1997 and 1998 monitoring reports. Road was treated in 1997.**	**Review indicates that crossings and water bars have stabilized and are effective, but grazing is retarding vegetative recovery. Utilization of seeded and native grasses is heavy. Level of grazing is reducing plant vigor and abundance.**
North Zone Bonners Ferry District Evaluation of Cow Creek Road Restoration	**Effectiveness: Work done on road is described in the 1996 monitoring report. In 1997, additional attempts were made to promote re-vegetation. Of sites disturbed in 1995 and to stabilize small gullies below road created by excessive water routing from the original ditch lines.**	**Review showed that recovery has been slow due to cattle grazing and encroachment, in some cases even reversing vegetative recovery. Elevated levels of surface erosion will continue for at least the next 10 years with current management practices and rates of recovery. The gently sloped meadows below road filter most of soil eroded from road before it can enter Cow Creek.**
North Zone Bonners Ferry District Evaluation of Obliteration of Skin Creek Road 627	**Effectiveness: Road was obliterated in 1998 following a fill failure in 1997. Road intercepted and concentrated water in wheel ruts for roughly 3/4 mile before causing fill failure.**	**Water bars were placed on an average 70 feet spacing. Low volume sediment plumes as far as 50 feet were evident. As a result, full control of surface erosion will rely more on dense vegetation. Re-contoured section was stable and well vegetated with the seeded grasses. Mass failure risk at crossings was eliminated and crossings are re-vegetating well.**
North Zone Bonners Ferry District Evaluation of Obliteration of Skin Creek Road 2549	**Effectiveness:** 200 feet of road experienced a fill failure many years ago and had been abandoned. Cut and fill slopes were not re-vegetating because of steepness. Road was fully re-contoured in 1999.	Seeded grasses and forbs are successfully re-vegetating the re-contoured slope. Plant density is providing low to moderate ground cover, but all indications show that site will continue to recover. Mass failure risk was also effectively reduced to a more natural level.
North Zone Bonners Ferry District Evaluation of Obliteration of Skin Creek Road 2533C	**Effectiveness: Rotational slumps occurred in 1997 where road was built on a stream breakland in the riparian zone and through lacustrine deposits. The portion of road was obliterated and fully re-contoured and covered with slash.**	**Review showed that treatment effectively eliminated related mass failure risk. Also, no widening or downcutting of Skin Creek occurred where a bridge was removed and the crossing was re-contoured.**

Project Location	Summary of Activities	Summary of Findings
North Zone Bonners Ferry District Evaluation of Keno Creek Road Obliteration	**Effectiveness: Project is described in detail in the 1999 monitoring report. Obliteration work was done in 1998.**	**Vegetation is more established from last year, grasses are thriving and cover 80-90% of road prism, roughly 90% of lodgepole seedlings are still thriving. Stream crossings did not down cut or widen appreciably since 1999 observations and all re-contoured slopes appear stable. Conditions appear the same as in 1999 where obliteration prescriptions were not met.**
North Zone Bonners Ferry District Evaluation of Grass Creek/Trapper Peak Fire Rehabilitation	**Effectiveness: Roads used to facilitate fire suppression and salvage from 1967 Trapper Peak Fire were rehabilitated following use. Many culverts and stream crossings were removed, but not all. Several of these roads were evaluated this year to look at the long-term effectiveness of treatment.**	**Inadequate water bar spacing beyond 70 feet is causing scour to a point that vegetation and debris were not filling and some surface erosion was occurring. Most of road cut and fill slopes were heavily vegetated with brush and conifers. Crossings that were pulled still had some raw banks because original contours were not re-established. Most crossings that were not pulled failed or were in the process of failing. These crossings were re-contoured in 2000 as part of the Upper Boundary Restoration Project.**
North Zone Bonners Ferry District Assessing the Aging Road Infrastructure District-wide	**Effectiveness: Majority of roads on district was built from the early 1950s to the late 1980s. Road maintenance is accomplished with programmed funds and timber sale road packages. Culverts typically have a limited service life of 20 years. The question is whether or not historic, current and anticipated culvert replacement and road maintenance can keep up with the rate and number of culverts that are nearing or are beyond the normal expected life service.**	**District hydrologist feels that replacement needs exceed current capacity to replace culverts or obliterate roads given current levels of funding, culvert age class distribution, and the large number of system and non-system road miles (2000+) on the district. The number of stream crossing failures related to loss of culvert integrity will likely increase in the future. District plans to begin collecting some baseline data about culvert condition while inspecting road obliteration projects. This cursory risk assessment may help prioritize where road maintenance and repair is most needed and can be most effective.**

Project Location	Summary of Activities	Summary of Findings
North Zone Bonners Ferry District Verifying Landtype and Landslide Risk Ratings Katka and Caribou Creeks	**Baseline:** Only one landslide and one stream crossing failure were discovered in 2000. The Katka Creek slide was found in 2000 but occurred some time between the springs of 1996 and 1999.	Katka Creek – type of failure was a debris avalanche on a 263-land type. It was a structural failure of saturated glaciofluvial deposits on steep stream break lands. Caribou Creek – type of failure was stream crossing that caused road to intercept and re-route stream flow on a 353-land type. Culvert was plugged and road prism severely gullied. Road has several high-risk crossings that need to be obliterated or maintained. The failed crossing must also be treated.
Central Zone Coeur d'Alene District Snowstorm/Daisy Restoration Project	**Implementation:** Contract implemented restoration work on a total of 4.1 miles of 3 different roads. 2.5 miles of road were re-contoured while 1.6 miles of road had water bars constructed across the running surface.	Project was verified to be implemented as designed.
Central Zone Coeur d'Alene District Prado Creek Restoration Project	**Implementation:** Contract implemented restoration work on a total of 1.6 miles of 3 different roads. .1 miles was scarified, while the rest of the roads had water bars constructed across the running surface. A total of 6 stream crossings were removed on these 3 roads.	Project was verified to be implemented as designed.
Central Zone Coeur d'Alene District Buckskin II Restoration Project	**Implementation:** Contract implemented restoration work on a total of 22.1 miles of 13 different roads. A total of 9 stream crossings were restored to natural conditions and 9-vented fords were installed at drivable stream crossings. Culverts were also upgraded. 109 water bars were constructed, 2 miles of road was fully re-contoured and 1.3 miles of road was partially re-contoured. 6.6 miles of road were scarified.	Project was verified to be implemented as designed.

Project Location	Summary of Activities	Summary of Findings
Central Zone Coeur d'Alene District Buckskin/Marten Creeks Culvert Replacement	**Implementation:** Pipe at Buckskin was originally a 48-inch by 68-inch squash pipe. It was upgraded to a bottomless arch pipe with a 16-foot span, 8-foot rise and 6-foot clearance. Pipe at Marten Creek was originally a 36-inch round pipe, and was upgraded to a bottomless arch pipe with a 12-foot span, 6-foot rise, and 4-foot clearance. These pipes were installed to meet INFISH requirements for the 100-year flood and to help with fish passage.	Project was verified to be implemented as designed.
Central Zone Coeur d'Alene District Happy Hog Restoration Project	**Implementation:** Contract implemented restoration work on a total of 5.1 miles of 6 different roads. 18 stream crossings were restored to natural conditions, 2 roads had 200-foot front-end obliteration and 81 water bars were constructed over 5.1 miles of rehabilitated road.	Project was verified to be implemented as designed.
Central Zone Coeur d'Alene District Millrose/Curran Restoration Project	**Implementation:** Contract implemented restoration work on a total of 6.2 miles of 6 different roads. 19 stream crossings were restored to natural conditions, .2 miles of road was re-contoured, 49 water bars were installed and all roads but one had front-end obliteration closures installed.	Project was verified to be implemented as designed.
Central Zone Coeur d'Alene District Kings Ridge Restoration Project	**Implementation:** Project was started at end of 2000 field season. Contractor worked only 3 or 4 days before getting snowed out. Part of Lake Gulch roadwork was completed.	Project was verified to be implemented as designed. Remaining work will be accomplished during the 2001 field season.
Central Zone Coeur d'Alene District 602 Tourist Creek Restoration Project	**Implementation:** Project was started in the 1999 field season**.** There was work that remained on 5 different roads. 8 channel sites were restored to natural conditions, .4 miles of road were obliterated, and all 5 roads had 200-foot front-end obliteration closures installed. 6 water bars were installed.	Project was verified to be implemented as designed.

Project Location	Summary of Activities	Summary of Findings
Central Zone Coeur d'Alene District Murray Scenic Night Restoration Project	**Implementation:** Project was started in 1999. 13 stream crossings were restored to natural conditions and all roads but one had front-end obliteration closures installed.	Project was verified to be implemented as designed.
Central Zone Coeur d'Alene District Beaver Creek Slope Stabilization	**Implementation:** Project was started during the 1999 field season. Restoration work involved road maintenance and culvert upgrade/replacements, and 2 stream crossings were restored to natural conditions. A section of fill slope that was cracking was repaired.	Project was verified to be implemented as designed.
Central Zone Coeur d'Alene District Burnt Cabin Creek Bank Barbs	**Implementation:** Creek flooded during 2000-spring runoff. Road was severely eroded and a culvert was washed out. Road was repaired despite the fact that the district fisheries biologist said that repairs violated INFISH standards. 2 large rock barbs were constructed to help divert water away from encroaching road and dissipate energy. Future projects will relocate encroaching section of road from flood plain and construct a new channel utilizing the entire floodplain.	Project was verified to be implemented as designed.
Central Zone Coeur d'Alene District 209 Road Relocation	**Implementation:** 1.5 miles of road was relocated from the floodplain of the Little North Fork Coeur d'Alene River. The old section of road was excavated down to floodplain level 1000 feet of road was re-contoured and fill pulled from the floodplain. 2 overflow culverts were removed and a single overflow channel was constructed in their place. Rock barbs were also installed to protect undercut and eroding banks. Another culvert was removed and hen restored to its natural state. The last 200 feet of old road was re-contoured to close access to the old road.	Project was verified to be implemented as designed.
Central Zone Coeur d'Alene District Beauty Creek Flood Damage Repair	**Implementation/Effectiveness:** Original project was completed in 1999. Project involved installation of riprap walls, vortex weirs, gabion baskets and log barbs. A major flood event occurred shortly after completion of project.	As a result of the flood, the majority of work that was done in 1999 was affected. A variety of work was done to restore the affected channel that included bank repair, point bar reshaping, riffle reshaping, and repair of eroded areas within the floodplain. Some of the original structures were either removed because they were not functioning or they were reset to allow the stream to migrate within the floodplain more efficiently.

Project Location	Summary of Activities	Summary of Findings
Central Zone **Coeur d'Alene District** **Tourist, Big Elk and Jupiter Creeks** **Watershed Restoration, Road Obliteration**	**Effectiveness: Projects were implemented in 1993 and in 1999. Involved removal of 24 stream crossings in the headwaters and installation of 28 gradient control structures.**	Streambeds in all crossings are very stable, no head cutting or down cutting were observed. Only minor scouring was observed. Most gradient control structures functioning properly, with exception of 2 which had undercut structures due to improper placement. 4 structures were not functioning due to stream migration. A downstream structure is still functioning and placement of large, woody debris is helping with stability and storing sediment. Most banks very stable with no sloughing or over-steepening. Some bank instability due to fact that side slopes were not pulled back to handle higher flows. Vegetation is continuing to be well established and will help stabilize exposed banks over time. Overall, restoration activities were effective at reducing downstream sediment.
South Zone **St. Joe District** **Wood, Bechtel Creeks** **Road Obliteration and Stream Crossing Removal**	**Effectiveness: Project involved the obliteration of 1.5 miles of road and stream crossing removal. Past obliteration and stream crossing removal in Bechtel Creek.**	**All of the areas had good vegetative cover and did not appear to be generating sediment.**
South Zone St. Joe District Best Management Practices Bovine Pine, Rocket Run, Get Shorty Timber Sales	**Effectiveness:** The zone hydrologist conducted BMP monitoring on 3 timber sales.	**Bovine Pine** skid trails were monitored for water bar installations and vegetative cover. Water bars were functioning and adequately spaced. No erosion was found on the 1.5 miles surveyed**. Rocket Run** road location, drainage, and landing areas were inspected. Water bars were functioning and drainage was good, with the exception of one area where water flowed over road and some minor erosion occurred. No erosion was noted at landings. **Get Shorty** forwarder trail and harvesting operations were observed on two different dates. Forwarder trail did not have erosion problems. Harvesting machinery was operating on slash and only some minor soil displacement was evident. An excavated temporary skid trail was constructed on the contour and no erosion on the trail was noted.

Project Location	Summary of Activities	Summary of Findings
South Zone St. Joe District Bird, Eagle, Boulder, Hobo Creeks Road Obliteration and Rehabilitation Projects	**Implementation:** Projects involved culvert removal, full re-contouring, partial re-contouring, and soil de-compaction on roads within these watersheds.	Stream rehabilitation at culvert removal sites appeared to be as specified with good wood placement of gradient control structures and with boulders where available. Full and partial re-contouring removed the desired amount of fill. Seeding, fertilizing and mulching were also within contract specifications. De-compaction was done with dozer rippers and the depth of de-compaction met requirements.
South Zone St. Joe District West Fork Hobo Creek Culvert Placement	**Implementation:** Existing culvert was placed with a larger culvert.	Placement appeared good. Culvert bottom was not covered with alluvium but this may require high spring flows. Seeding and mulching appeared adequate and riprap placement and size was adequate. The sediment basins below culvert were functioning but will require cleaning.

Forest Plan Monitoring Item G-4: Fish Population Trends

The goals of the 1987 Forest Plan related to fish population and stream habitat are as follows:

- Provide for diversity of plant and animal communities.
- Manage the habitat of animal and plant species listed under the Endangered Species Act to provide for recovery as outlined in species recovery or management plan. Manage habitat to maintain population of identified sensitive species of animals and plants.
- Manage fisheries habitat to provide a carrying capacity that will allow an increase in the Forest's trout population.
- Maintain high quality water to protect fisheries habitat, water based recreation, public water supplies, and be within state water quality standards.
- Manage resource development to protect the integrity of the stream channel system.

The implementation of these goals are to be monitored and evaluated to determine how closely the Forest Plan management standards are being followed, how well the Forest is meeting its planned goals and objectives, if the effects of implementing the Forest Plan are occurring as predicted, including significant changes in the productivity of the land, and if research is needed to support the management of the Forest.

In conjunction with the Idaho Department of Fish and Game, the Forest conducted annual surveys of a subset of streams on the IPNF. FY 1998 Monitoring Report had a detailed account of fisheries surveys. For FY 2000, a summary of activities will be provided.

Aquatic habitat inventories were conducted and fish populations sampled in streams on the St. Joe Ranger District during FY 2000. The objective of the Surveys of Stream Habitat and Fish Populations was to provide baseline information for establishing existing conditions of fish habitat and fish assemblages in the various watersheds. Electro-fishing surveys were conducted and snorkel techniques were also used to assess the fish population assemblage. (Table 13)

Table 13. Surveys of Stream Habitat and Fish Populations on St. Joe Ranger District

Activity	Methodology	Units	Accomplished
Fish Habitat Survey	R1/R4 survey	miles	1
Presence/Absence Survey	Electrofishing	streams	14
Presence/Absence Survey	Snorkeling	streams	3
Culvert Survey	Fishing	each	17
Bull Trout Redd Survey	Ocular	miles	20

Bull trout were listed on June 10, 1998 as Threatened under the Endangered Species Act (ESA). The objective of the Bull Trout Redd Survey is to monitor the abundance and distribution of spawning activity in selected streams in the St. Joe River watershed. The bull trout spawning season in the St. Joe River drainage was monitored by the U.S. Forest Service and representatives from various organizations (Idaho Department of Fish and Game, Panhandle Chapter of Trout Unlimited, University of Idaho, Washington Water Power, and other volunteers.) FY 2000 Great Bull Trout Redd Hunt marked the ninth consecutive fall season that such an effort has occurred in an attempt to monitor the state of knowledge regarding bull trout use of spawning and rearing habitat in the St. Joe River and its tributary streams. The information collected during the survey includes the number and approximate locations of adult bull trout and bull trout redds as well as the stream distances surveyed. General habitat conditions (e.g. habitat type, cover, and substrate) associated with redds have also been recorded. Twenty miles of streams were surveyed.

In the North Zone, the objective in FY2000 of stream habitat and fish populations surveys was to provide baseline and/or supporting information to establish existing conditions in various watersheds selected, based on data needs for current or future projects or obtaining data for threatened and endangered species needs (i.e. bull trout).

There are several ways in which the above objective was reached, this included R1/R4 fish habitat surveys, electrofishing, snorkeling, walk-throughs, and bull trout redd surveys (Table 14)

Table 14. Surveys of Stream Habitat and Fish Populations in North Zone

Activity	Methodology	Units	Accomplished
Fish Habitat Survey	R1/R4 survey	miles	10.0
Presence/Absence Survey	Electrofishing	miles	5.1
Presence/Absence Survey	Snorkeling	miles	2.9
Walk-through	Survey	miles	7.0
Bull Trout Redd Survey	Ocular	miles	7.5

The bull trout spawning season in the Lake Pend Oreille drainage was monitored by the Idaho Department of Fish and Game, Palouse Unit of the American Fisheries Society from the University of Idaho and representatives from various organizations (e.g. Panhandle Chapter of Trout Unlimited, Avista, and USFS) in FY 2000. During this cooperative effort, bull trout redd surveys were primarily conducted by USFS employees in Grass (Bonners Ferry RD), Gold, and Lightning (Sandpoint RD) Creeks. The latter two streams fond bull trout redds during surveys, however in Grass Creek no redds were found. A total of 18 watersheds were sampled in the Lake Pend Oreille drainage alone in FY 2000 by the various partnerships and these have been collected in since 1983.

Snorkeling and electrofishing surveys were conducted in eight separate drainages across the north zone with various levels of intensity based on needs for the data collected. This

resulted in over 50 cross-sections completed for a total of nearly eight miles surveyed. The results of this survey work resulted in all cross sections surveyed in Priest Lake RD containing eastern brook trout (*Salvelinus fontinalis*) and Sculpin spp. Snorkel surveys in Grass Creek (Bonners Ferry RD) resulted in sittings of eastern brook trout and coastal rainbow trout. Snorkel surveys in West Gold Creek identified bull trout and westslope cutthroat trout.

Forest Plan Monitoring Item H-1: Threatened and Endangered Plants

Forest Plan direction for sensitive and rare species, including plants, are to manage habitat to maintain population viability, prevent the need for federal listing, and to determine the status and distribution of Threatened, Endangered and Sensitive (TES) and other rare plants.

Background

Threatened Species: Prior to 1998, only one threatened plant was listed for the Idaho Panhandle, *Howellia aquatilis* (water howellia). This species was historically (1892) known to occur within the Pend Oreille sub-basin, near Spirit Lake, Idaho, on private land. Surveys conducted by Idaho Conservation Data Center (ICDC) botanists in 1988 failed to relocate this population. Existing populations are known for adjacent areas in eastern Washington, western Montana, and south in the headwaters of the Palouse River in north-central Idaho. Surveys of suitable habitat (vernal pools) across northern Idaho by USFS and ICDC botanists in subsequent years have failed to find additional populations. It is believed to be locally extinct. Surveys of suitable habitat on federal lands will continue following requirements found in the Endangered Species Act of 1974 and Forest Service policy.

In early 1998, the U.S. Fish and Wildlife Service (USFWS) listed the orchid, *Spiranthes diluvialis* (Ute's ladies'-tress), as threatened. Based on populations that occur in inter-montane valleys of Montana, the shores of an alkaline lake in Washington, and populations in southern Idaho, Utah, Nevada, Wyoming, and Colorado, northern Idaho was thought by the U.S. Fish and Wildlife Service to have some potential habitat. Surveys of habitat (deciduous cottonwood and open meadow riparian areas) by USFS and ICDC botanists have yet to document populations or any highly suitable habitat in northern Idaho. In a recent report by the Idaho Conservation Data Center on predicting the distribution of potential habitat, very few of the plant associations known to host Ute's ladies-tresses occur in northern Idaho. The likelihood of Ute's ladies-tresses actually occurring in northern Idaho is remote. Removal of this species from the IPNF threatened list will likely occur in the future, based on concurrence from the USFWS which has the responsibility for this species.

In December of 1999, the USFWS proposed listing the plant Silene spaldingii (Spalding's catchfly). This long-lived perennial forb species is known for 52 sites in west-central Idaho, northwestern Montana, adjacent British Columbia, northeastern Oregon, and eastern Washington. In eastern Washington, this species is known for remnant patches of native bluebunch wheatgrass and fescue grasslands. This habitat is limited on national forest lands to some low elevation areas in close proximity to the Palouse prairie, and breakland areas along the major river corridors. The USFWS has determined that habitat exists on the Idaho Panhandle. In the spring of 2000, Botanists on the Idaho Panhandle developed a process to predict potential habitat (e.g. grasslands) utilizing the SILC (Satellite Imagery Land-cover Classification) data. Broad-scale and

project level surveys were conducted during the field season of 2000 to validate predicted habitat and search for populations. No populations of Spalding's catchfly have been found to date on the Idaho Panhandle. Biological Assessments currently are addressing Silene as a proposed species following requirements in the Endangered Species Act and Forest Service Policy.

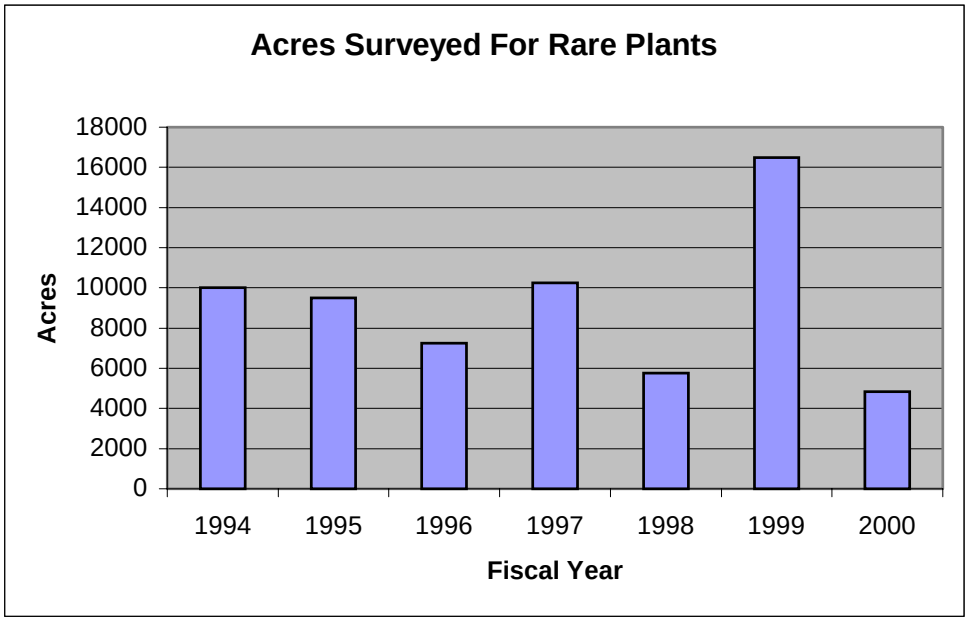
Sensitive Species: In March of 1999 the regional sensitive species list was updated, following the Region 1 Species-at-Risk Protocol. The new list contains 64 species listed as 'Sensitive' by the USFS. The Idaho Conservation Data Center 'tracks' a larger list of rare vascular and non-vascular plants in the State, of which the USFS sensitive list is a subset. Currently, the ICDC lists 94 vascular plants and 16 non-vascular plants (lichens, mosses and liverworts) for the IPNF. Generally, the USFS sensitive list contains the species most at risk on federal lands. The additional 46 species on the ICDC list can be thought of as 'species of concern'; plants that are rare at the state scale, but for which there either are: a) few identifiable threats, b) some large, secure populations, or c) no occurrences are known for federal lands. The Species-at-Risk Protocol allows forests to also develop a "Forest Species of Concern List" to address some of these rare species for which there may be local concern. While no biological evaluations are prepared for these 'rare' plants like sensitive plants, any viability concerns are addressed in environmental documents. More information on the species on the ICDC lists can be found on the Internet at http://www2.state.id.us/fishgame/info/cdc/cdc.htm.

Monitoring Data

Surveys: During project planning, qualified botanists assess habitats for their suitability to support sensitive and rare plants. Habitat found to be suitable within project areas, and which would be affected by a project, is surveyed to determine the presence of rare plant species. Protection measures are implemented to maintain population and species viability following the National Forest Management Act and Forest Service policy. In 2000, forest botany personnel performed on-the-ground clearance surveys on 4,827 acres of high potential habitats for TES and rare plants in support of various projects including timber, watershed, fisheries, KV, trails, grazing, special use, and land exchange projects. This also includes a small amount of landscape level surveys not associated with any project. These landscape level surveys are especially important to understanding the distribution of species as they generally occur in remote areas that have a very high potential to support populations (e.g. old growth cedar groves, remote peatlands, Research Natural Areas). Often these areas are ones that likely will not have projects in the future that would require surveys.

Survey trends: The number of acres surveyed for rare plants is a measure of the Forest Plan commitment to determine the status and distribution of rare plants within the Idaho Panhandle National Forests. Qualified botanists and other personnel that have had training in botany and sensitive plant identification conduct botanical surveys.

Figure 5. Acres Surveyed For Rare Plants

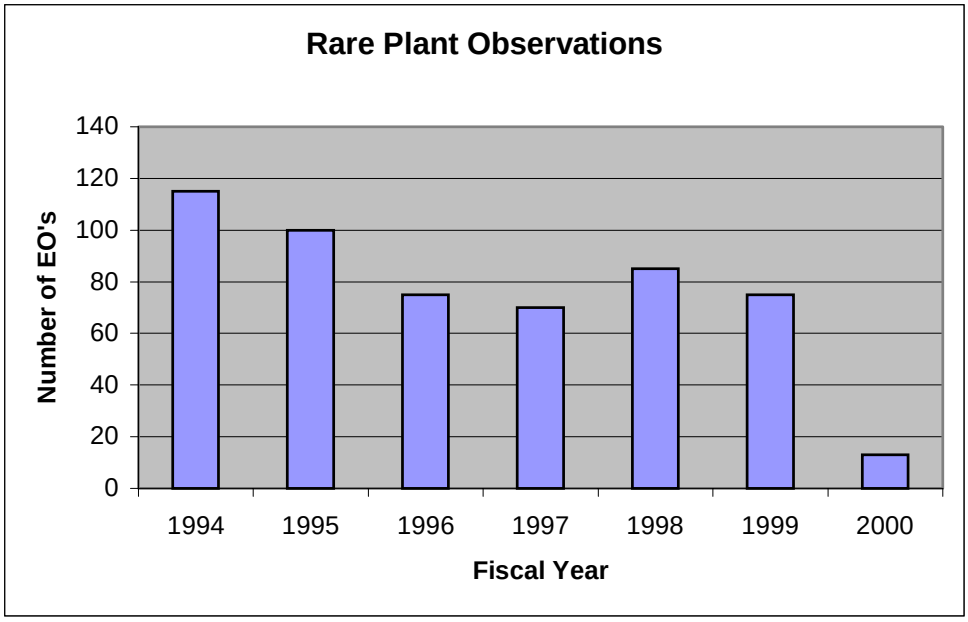


Good records of the number of acres surveyed by botany personnel have been kept since 1994. From 1988 until 1993 the exact number of acres surveyed was not well documented, but is estimated to be about 5000 acres. Prior to 1988, the Forest Service did not conduct surveys and rare plant observations reported to the ICDC were incidental. From 1994 to 2000, surveys occurred on 63,977 acres of federal lands with the express purpose of documenting and protecting rare plant populations from management activities and mitigating potential adverse effects. In 2000, 4,827 acres were surveyed for sensitive and rare plants, a decrease from 1999. This decrease was due mainly due to the large acreage that was surveyed in 1999 for the Douglas-fir Beetle project. Recent estimates of sensitive plant habitat (from IPNF Geographic Assessments) have determined that approximately 625,000 acres (~25%) of the total land base of the IPNF has the potential to support sensitive plant species in a wide array of plant communities. To date, about 10% of all suitable sensitive plant habitats have been surveyed.

Observations: Another measure of the status and distribution of rare plants is the number of occurrences documented for the five northern counties of Idaho. Information was compiled from the Idaho Conservation Data Center (ICDC, 2000), which is the repository of all information relating to rare species in the State. The information below includes some sightings on non-federal lands. However, the vast majority of observations come from lands under federal management. Sightings on adjacent private lands are important in understanding the distribution of occurrences in the ecosystem as a whole. However, there are no laws governing rare plants on non-federal lands in the State of Idaho,

subsequently few surveys have occurred on non-federal lands and observations have generally been incidental discoveries. Between 1892 and 1987 there were 119 observations documented for rare plants in the 5 northern counties, federal and non-federal lands. Since 1988, botanists and other personnel from the USFS, the Bureau of Land Management, and the Idaho Conservation Data Center have documented over 766 occurrences, for 80 rare species, mostly on federal lands. In 2000 there were 13 element occurrences reported for the five northern counties.

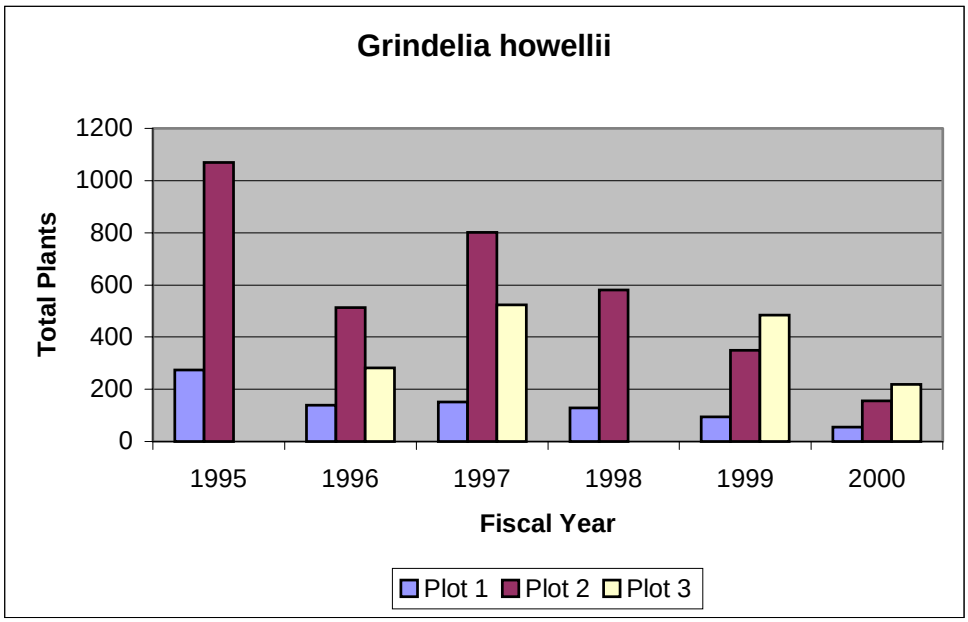
Figure 6. Rare Plant Observations



Based on Idaho Conservation Database (ICDC, 1999) and Forest Service records.
EO = Existing Occurrences

Formal Population Monitoring: ICDC and USFS botanists have installed a number of formal, permanent monitoring plots over the last ten years, and baseline information has been collected (see 1998 Forest Plan Monitoring Report). However, only a few of the formal monitoring plots have actually had multiple year, repeated measures to evaluate population trends. In 2000 only the Howell's gumweed (Grindelia howellii) plots were monitored. This species is a former candidate for listing as threatened by the USFWS and is an Idaho and western Montana endemic. The data for this monitoring is shown in Table 13 and Figure 7.

Figure 7. Grindelia howellii Monitoring



The data for Howell's gum-weed show a cyclical pattern of population demographics. Plot 3 was not established until 1996, and a sampling error in 1998 rendered the plot 3 data unusable. Regression analysis, based on trends from the other two plots, predicts that 1998 numbers for plot 3 would be about 431 plants. The trend from 1999 to 2000 is a reduction in total plants from 484 to 219. Plot 1 went from 95 to 55, and Plot 2 went from 349 to 156. All the plots have had the same type of cyclic trends, likely a response to the same environmental stimuli: precipitation, snow-pack, etc. The 6-year trend is slightly down, and concern for this species remains high. Monitoring will continue in 2001. There are a total of 14 grindelia 'colonies' within a couple square miles of each other, all that is known in the state. These 3 plots are representative of the 14 colonies, and likely reflect what is happening to the entire population in the area.

Table 15. Grindelia Summaries

Plot 1	Germ/Juvenile	NFADS	FADS	Ave Flowers	Total Plants
1995	221	48	4	9.33	273
1996	30	99	10	11.5	139
1997	23	21	8	11.13	152
1998	21	89	20	10	129
1999	2	62	31	8.65	95
2000	2	32	21	6.7	55

Plot 2	Germ/Juvenile	NFADS	FADS	Ave Flowers	Total Plants
1995	739	257	74	8.05	1070
1996	137	276	100	3.53	513
1997	415	354	33	7.36	802
1998	189	332	60	7.3	581
1999	114	214	21	4.29	349
2000	71	81	4	3.75	156
Plot 3	**Germ/Juvenile**	**NFADS**	**FADS**	**Ave Flowers**	**Total Plants**
1995	No data				
1996	91	166	25	5.76	282
1997	282	219	22	7.64	523
1998	Data not usable, errors				
1999	126	306	52	4.04	484
2000	39	158	22	3.86	219

Notes: Germ = germinant; NFAD = non-flowering adult; FADS = Flowering adult. Average flowers is average flowers per flowering plant.

Reference: Idaho Conservation Data Center, 2000. Rare Plant Occurrence Records. Idaho Fish and Game, Natural Resources Policy Bureau, Boise Idaho.

Forest Plan Monitoring Item I-1: Minerals

The purpose of this monitoring item is to determine if the operation of mining activities meet Forest Plan standards.

Background

Most current mining activity on the IPNF consists of placer mining for gold in alluvial bottoms on the central part of the Forest. There is a small amount of exploration for vein deposits of metals (sometimes referred to as hard rock mining). There are no active hard rock mining operations on national forest land on the IPNF. There is garnet recreation mining on the southern part of the Forest with some saleable/lease activity for commercial garnet removal.

For the summary of activities listed below the following explanations are needed. Exploration or mining activity that is likely to result in a significant amount of land disturbance requires a reclamation bond to insure that funds are available to reclaim the site. If the amount of resource damage would be negligible no bond is required. When the term "processing" is used it means that the plan submitted by the miner has been processed by the Forest Service and a decision has been made on whether they can proceed with the exploration or mining activity.

Monitoring Data

A. *Non-Bonded Non-Energy Operations Processed*: The number of operations processed that did not require a reclamation bond. Accomplishment is reported when an operation plan is processed to a decision.

Total Non-Bonded Non-Energy Operations Processed - 1,919 (many of these are garnet collecting permits on the St. Joe Ranger District)

B. *Bonded Non-Energy Operations Processed*: The number of operations processed for which reclamation bonds were required. Accomplishment is reported when an operating plan is processed to a decision.

Total Bonded Non-Energy Operations Processed - 9

C. *Total Bonded Non-Energy Operations*: The total number of new and existing bonded operations on which surface disturbance has occurred.

Total Number of Bonded Non-Energy Operations - 33

D. *Bonded Non-Energy Operations Administered to Standard*: The number of bonded operations administered to a level that ensures compliance with operating plans.

Total Operations Administered to Standard - 33 (This includes the twenty-four operations on which surface disturbance has occurred and nine where it has not.)

Evaluation: All bonded non-energy operations are being administered to standard.

Forest Plan Monitoring Item K-1: Prescriptions and Effects on Land Productivity

Background

Our Forest Soil Resource objective is to maintain and restore long-term productivity, to support healthy vegetative communities and protect watersheds. Key elements of maintaining long-term soil productivity include retaining surface organic layers, surface volcanic ash, and the bulk density of the surface volcanic ash within natural ranges of variability.

The major detrimental impacts to long-term soil productivity are:

- Compaction
- Removal of topsoil (displacement)
- Units with insufficient organic matter and coarse woody-debris left on-site
- Areas that have been severely burned

Definitions of what is considered detrimental impacts:

- Detrimental Compaction: More than 20% increase in bulk density over natural for volcanic ash surface soils and the compacted soil must display a massive or platy structure.
- Detrimental Displacement: Removal of the forest floor and one inch or more of the surface mineral soil over a 25 sq. ft. or more area.
- Severely Burned: The soil surface is in a condition where most woody debris and the entire forest floor is consumed down to mineral soil. The soil surface may have turned red due to extreme heat. Also, fine roots and organic matter are consumed or charred in the upper inch of mineral soil.
- Coarse woody-debris recommendations are as follows:
    - Douglas-fir sites need 7 to 13 tons per acre
    - Grand fir sites need 7 to 14 tons per acre
    - Western hemlock/western red-cedar sites need 17 to 33 tons per acre
    - Subalpine fir sites need 10 to 19 tons per acre
- Optimum levels of fine organic matter are 21 to 30 percent in Douglas fir and grand fir habitat types. In subalpine fir, moist western hemlock and western

red-cedar habitat types, strong levels of fine organic matter exists at 30 percent or greater (Graham, et al. 1994).

This years monitoring focused on the following two harvest systems:

1) A feller bunched and rubber tire skidded operation on Unit 1, of the Moodoo Salvage sale was monitored at the Sandpoint Ranger District (Section 10, T54N, R4W).

2) A cut to length harvester and log forwarder operation on Unit 1 of the Kat-tail sale was monitored at the Bonners Ferry Ranger District (Sections 35 & 36, T62N, R2E).

Monitoring Data

1) Unit 1 on the Moodoo Salvage sale had 30 percent detrimental compaction. This exceeds our Forest Plan standards by 10 percent and the recently revised Regional Soil Quality standards by 15 percent. The 30 percent detrimental compaction was the cumulative effect of two timber sales and past grazing. The most current timber sale produced 20 percent detrimental compaction, the other 10 percent was pre-existing. The percentage of detrimentally compacted ground was based on 4 random transects run across Unit 1, which resulted in 323 sample sites; 97 of which were detrimentally compacted.

The Sandpoint District followed the direction in a clarification letter issued by the Region One office which assumes that mechanical harvesters with ground pressure ratings of 8 pounds per square inch or less, will not create detrimental compaction if their operations are dispersed across an activity area (Dale Bosworth letter, June 14, 2000). This assumption holds true on many soils in Region One, but not on the deep volcanic ash soils on the Idaho Panhandle National Forest, which contain very little rock fragment within the surface volcanic ash layers. Where these deep, ash soils occur, detrimental compaction can happen with only a single pass, even with low ground pressure equipment.

The skid trails on Unit 1 were properly designated and located at recommended distances to limit soil compaction and disturbance. As recommended, skidding equipment stayed on the designated trails. The excess compaction problem occurred when the low ground pressure feller buncher machine made passes perpendicular to skid trails to fell individual and groups of trees.

The Sandpoint District will decompact the feller buncher tracks and non-dedicated skid trails or landings this summer to bring the site back within soil quality standards.

A field review of the deep volcanic ash soils was conducted with the Forest and Regional Soil Scientists last fall and all agreed that deep, volcanic ash soils with low rock fragment content will detrimentally compact with low ground pressure, harvest equipment.

Detrimental compaction typically does not occur if this equipment is operated on a slash mat or on 12 to 16 inches of snow.

Unit 1 of the Moodoo Salvage sale is in Douglas Fir/ snowberry habitat type and the recommended range of coarse woody debris would be 7 to 13 tons per acre and fine organic matter should be 21 to 30 percent. The average coarse woody debris on this unit is 10 percent and the fine organic matter content averaged 25 percent. Both coarse woody debris and fine organic matter contents are well within guidelines.

2) Unit 1 on the Kat-tail timber sale had 14 percent detrimental compaction. This unit meets Regional and Forest Plan soil quality standards from a soil compaction standpoint. The Kat-tail Unit also met the fine organic matter guidelines but was low on the coarse woody debris guidelines.

This unit is in the western red-cedar habitat type and the recommended range of coarse woody debris is 17 to 33 tons per acre and fine organic matter for these habitat types should be 30 percent or greater. Transects on this unit ranged from 5 to 17 tons per acre with and average of 10 tons per acre for coarse woody debris and 33 percent was the average for fine organic matter levels.

This unit appears to have a lot of coarse woody debris left on the ground, but because most of the woody material is 3 to 4 inches in diameter the overall tonnage came up low.

Evaluation

The results of the FY 2000 monitoring indicates that units which call for ground – based harvesting be well planned to minimize soil compaction.

On compaction sensitive, ash soils, the recommendation is that when possible ground - based equipment should create a slash mat in front of the equipment or operate on frozen ground and/or deep snow. Mechanical processor/harvesters can usually create their own slash mat as they proceed across a cutting unit.

Most feller bunchers cannot create their own slash mat, so if this equipment operates off designated skid trails, de-compaction will be required on most sites, to bring them back within soil quality standards.

A Forest-wide field trip was conducted during the summer of 2001 to address ground-based harvesting and how to minimize its impacts.

IV. OTHER TOPICS OF INTEREST

The Forest Plan does not require that the information in this section be part of the monitoring report. The information is included because of public interest in these subjects of forest-wide importance. Topics addressed include ecosystem restoration, inventoried roadless areas, old growth, Canada lynx, peregrine falcon, elk, whitebark pine, and fire.

Ecosystem Restoration

The scientific assessment of the interior Columbia River basin describes northern Idaho as dominated by heavily roaded moist forest types. The area is rated as having low forest, aquatic, and composite integrity. It also has moderate to high hydrologic integrity (Quigley, Thomas, et al, 1996. Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin and Portions of the Klamath and Great Basins, Gen. Tech Rep. PNW-GTR-382. Portland, OR, USDA Forest Service, Pacific Northwest Research Station).

Our forestland problems include the large-scale loss of potentially long-lived, shade-intolerant, tree species, such as white pine, whitebark pine, western larch and ponderosa pine. These species have been replaced with species such as grand fir and hemlock, which are less drought tolerant and more prone to attacks from insects and disease, and less fire resistant. Besides reductions in the shade-intolerant tree species, the number of shade-tolerant, moisture-demanding small understory trees per acre may have increased markedly. We also have less old and mature forest, fewer large trees, and more uniform areas dominated by dense stands of small and medium-sized trees. Overall, our landscapes are more homogenous than they were historically. Combined, these factors increase the risk of drought damage, large-scale insect and disease attack, and severe stand-replacing fires. They also reduce the amounts of some types of wildlife habitat.

Watershed and hydrologic functions can be impaired by weakened stream channel stability interacting with roads and normal flood events. This can result in excessive erosion rates and downstream sedimentation.

Our aquatic resource problems include the loss of quality fish habitat, the introduction of exotic species, such as brook trout, and potential damage from severe fires.

The scientific assessment identified primary opportunities to address risks to integrity. Some of the broad restoration actions that could be taken included:

1) Increase mature and old forest structures; manage stand densities; increase the proportion of white pine, larch, whitebark pine, and ponderosa pine; increase patch size, interior habitat, and variability in patch size, and allow larger areas to rest for longer times between disturbances.

2) Restore watershed function and aquatic habitats to provide a connection between aquatic strongholds (existing populations of native fish species).

3) Reduce fire, insect, disease (root rot, blister rust) susceptibility through management of forest tree species composition and structure.

IPNF Restoration Activities, 1992-2000

Since even before the scientific assessment of the interior Columbia River Basin was completed the IPNF has been working to address many of these same concerns. Listed below are some of the types of activities the Forest has been working on.

1) Increasing the proportion of white pine, larch, and ponderosa pine.

- Approximately 2,918 acres were planted to these species in 2000. (This includes the new, more blister rust resistant white pine). These three species tend to be best adapted to local climate, and most resilient to droughts, insects and root disease, and fire.

- From 1992-2000 there were 55,965 acres planted to these species. (These totals may vary somewhat from last year's monitoring report because we caught and corrected a previous mathematical error.)

2) Restoring White Pine Forests

The major cause of the loss of the white pine forests has been the introduction of the exotic disease, white pine blister rust. The IPNF has a two part long-term strategy to restore these important forests. Natural white pine has a very low level of resistance to the blister rust disease. For the first part of our strategy, the Northern Region of the U.S. Forest Service has used selected resistant trees in a multi-generational breeding program to accelerate the development of rust resistance in white pine.

- In 2000 the IPNF planted approximately 507,900 rust resistant white pine seedlings.

- From 1992 through 2000 the Forest planted over 10,021,900 rust resistant white pine seedlings.

The second part of our strategy involves maintaining a landscape-wide, naturally breeding, and genetically diverse population of wild white pine that can develop blister rust resistance through natural selection. We have cooperated with the U.S. Forest Service, Northern Region, Forest Health Protection Staff in publishing White Pine Leave Tree Guidelines (Schwandt and Zack, Forest Health protection Report 96-3, March 1996) to assure that even where we are harvesting trees, we will maintain a naturally breeding white pine population that has a high probability of capturing the available blister rust resistant genes. We began using these guidelines in 1996.

3) Managing tree stocking and forest structure

- 3,977 acres were thinned or released in FY 2000. Most of the thinning and release was to allow shade-intolerant larch, white pine, and ponderosa pine to maintain stand dominance, or to free over-crowded stands to grow freely.

- From FY 1992-2000, 59,370 acres were thinned or released.

4) Restoring the role of fire in the ecosystem thereby reducing risk of severe fires

- 11,077 acres of fuel treatment were accomplished in FY 2000.

- From FY 1992-2000 there were 79,312 acres of fuel treatment on the IPNF.

5) Watershed Improvement

- 1,028 acres of watershed improvement were accomplished in FY 2000.

- From FY 1992 to 2000 there were 9,277 acres of watershed improvement.

6) Road obliteration/decommissioning

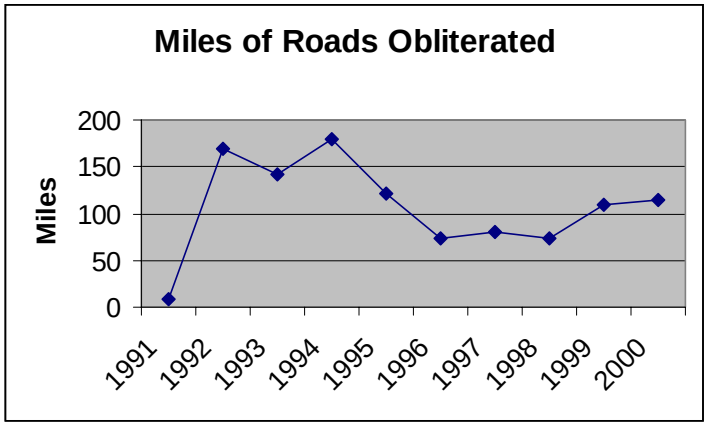
- There were 114.8 miles of road obliterated in FY 2000 as part of ecosystem restoration work, using a variety of funds.

- Table 16 shows that there were 1,074.5 miles of road obliteration on the IPNF from FY 1991-2000. System roads are generally the ones that are inventoried, maintained and managed by the forest. The other roads are not.

Table 16. Miles of Roads Obliterated

FISCAL YEAR	SYSTEM ROADS	OTHER ROADS	ALL
1991	0	8.0	8.0
1992	141.8	28.3	170.1
1993	115.2	27.6	142.8
1994	119.3	59.9	179.2
1995	95.9	25.7	121.6
1996	58.9	14.3	73.2
1997	79.2	1.1	80.3
1998	71.5	2.8	74.3
1999	51.9	58.3	110.2
2000	91.8	23.0	114.8
TOTAL	**825.5**	**249.0**	**1,074.5**

Figure 8. Miles of Road Obliterated



Future Restoration Activities

In the future, our ecosystem restoration activities will focus on the following types of activities:

- Concentrating vegetation treatments in larger blocks, coupled with allowing other large blocks to remain undisturbed for longer intervals.
- Increasing the use of prescribed fire to reduce severe fire risk and restore the role of fire in the ecosystem.
- Reducing road densities, especially in areas with high densities.
- Stabilizing and improving channel stability.
- Creating openings for the reintroduction of white pine, ponderosa pine, larch and whitebark pine.
- Thinning dense stands to favor white pine, ponderosa pine, and larch, and to promote large trees and reduce competition for moisture on dry sites.
- Restoring riparian areas and protecting inland native fish strongholds.
- Protecting habitat for threatened and endangered species, such as woodland caribou, gray wolf, grizzly bear, and bald eagle.
- An important aspect of our ecosystem management strategy is to focus restoration activities in priority areas where multiple ecological problems can be addressed. The objective is to improve the condition of several ecosystem components and not just a single one, such as vegetation or aquatics.

Old Growth

Standards in the 1987 Forest Plan call for maintaining "10% of the forested portion of the IPNF as old growth". The Forest Plan identified 2,310,000-forested acres on the IPNF. Therefore, the Forest Plan Standard requires maintaining 231,000 acres of old growth on the Forest. From 1990 through 1993 we did an intensive inventory of our old growth resources. Since that time, we have continued to update our old growth inventory as better inventory data becomes available, and as the forest changes in response to natural events. The information presented below represents our most up-to-date information as of the end of year 2000. During 2001 through 2002 this National Forest will be reviewing all our Old Growth data to be sure it reflects the most current conditions on the ground. We don't expect any major changes, but we are continually striving to make our information about this important resource as precise as humanly possible. Results from this review should be available in early 2003.

Our data base allows us to track old growth in several categories, depending upon how it was identified in the inventory and how it is currently allocated. We separate our old growth into the "allocated" old growth stands that were specifically identified and "retained" to meet the 231,000-acre forest plan standard, and "additional" identified old growth that serves old growth ecological functions, but is not subject to any special allocation.

"Existing Old Growth" fully meets all Northern Region old growth defining criteria. The "Ancient Cedar" category is part of our existing allocated old growth, but we track it separately because we want to take special care of the best that we have. "Ancient Cedar" stands are dominated by trees over 5 feet in diameter and generally over 500 years old; they far exceed minimum old growth criteria.

"Potential Old Growth" meets most old growth defining criteria, but is lacking somewhat in some characteristic. The most common situation is that the "potential old growth" has more than enough large trees to meet old growth criteria, but the trees are not quite old enough; however, these are usually the largest and oldest trees we have in a given area. Some "potential old growth" is included in our old growth allocation because it is the best that we have available in an area, and distribution of old growth across the landscape is important. Other allocated "potential old growth" blocks are small pieces that contribute to the integrity of a larger patch of allocated old growth, or serve as part of a corridor linking two old growth patches. Large old growth patches are generally more valuable as wildlife habitat, and linkages across the landscape are important.

Old growth totals are presented in Table 17 on the following page. Forest Plan Standards call for us to maintain 231,000 acres of old growth (10% of our forested acres). We have identified and allocated 250,776 acres (10.9% of our forested acres) to be retained as old growth. We also have an additional 24,123 acres (1% of our forested acres) of field verified unallocated old growth, which provides old growth habitat for wildlife and serves other ecological functions. Not showing in the table below are an additional

13,800 acres that have been aerial photo identified as possible old growth, but have not yet been field checked.

Table 17. Acres of Old Growth By Subbasin

Sub-Basin (River)	Allocated Existing Old Growth	Allocated Ancient Cedar	Allocated Potential Old Growth	Total Allocated Old Growth	Additional Field Verified Old Growth	Total All Old Growth
St. Joe	58,062	404	13,491	**71,957**	8,174	**80,131**
Coeur d'Alene	56,295	0	3,827	**60,122**	0	**60,122**
Pend Oreille	19,531	53	4,972	**24,556**	0	**24,556**
Kootenai	47,419	485	2,952	**50,856**	15,615	**66,471**
Priest	40,000	904	2,381	**43,285**	334	**43,619**
Forest Total	**221,307**	**1,846**	**27,623**	**250,776**	**24,123**	**274,899**

Although most of the Idaho Panhandle National Forest is a moist forest environment, we do have some low elevation areas with dry forest habitat types (ponderosa pine and Douglas-fir habitat types, and the very driest grand fir habitat types). Although these dry areas represent less than 10% of our forested acres, they are quite important in terms of the plant and animal species they support. The natural processes that maintained Old Growth on dry sites were very different than on moister sites. Historically, these dry forest habitat types were subject to frequent low-severity underburns that thinned out the trees and favored large trees of the most fire-resistant species. The frequent low-severity fires also thinned out smaller trees (thus limiting moisture demands on these dry sites), and reduced dead woody fuels and live ladder fuel accumulations that would have otherwise increased the risk of stand replacing wildfires. These frequent low-severity fires were the keystone natural process that maintained dry site old growth.

Now, on dry habitat types, 65 years of fire suppression has allowed in-growth of dense stands of smaller trees and accumulation of high woody fuel loads. The large number of trees in these denser stands creates higher moisture demands than in the historic, fire-maintained open stands. This higher moisture demand stresses the old growth trees during drought times, and predisposes stands to bark beetle outbreaks. During drought years we are seeing unnaturally high levels of mortality amongst old trees in these unnaturally dense stands. In addition, the dense small trees can serve as fuel ladders that can carry flames into the upper canopy of large old trees. This new situation creates an unnaturally high risk of stand replacing fire that can kill the old growth trees. Suppression of low severity fires has actually created a situation that threatens the continued existence of old growth on these dry sites.

In 1999 the Douglas-fir Beetle Environmental Impact Statement (EIS) selected an alternative that will involve activity in up to 340 acres of dry site old growth on the Priest Lake Ranger District. This project will harvest beetle-infested Douglas-fir out of several

overly dense stands, and will re-introduce low severity fire in these stands. This project maintains treated stands in old growth condition, moves stands toward greater dominance by historic ponderosa pine, and maintains both live large trees and sufficient numbers of snags, while reducing risks to the viability of the Old Growth. This action is necessary to reduce the unnaturally elevated risk of bark beetles attack and stand replacing fire that currently threatens the continued existence of this dry site old growth. This activity begins to restore the historic disturbance processes that are necessary to maintain old growth on these dry sites. On dry habitat types, restoration of historic disturbance processes is necessary to meet the forest plan standard of maintaining old growth.

Canada lynx, Peregrine Falcon, and Elk

CANADA LYNX

The Canada lynx was listed as a threatened species in March 2000. Biologists on the Idaho Panhandle National Forest mapped lynx habitat across the forest and identified lynx analysis units (LAUs) where lynx habitat will be monitored in accordance with the Canada Lynx Conservation Assessment and Strategy. This new document, published in August 2000, gives direction on how to coordinate lynx management with other activities on the national forest such as logging and recreation. A Programmatic Biological Assessment for lynx was written, which evaluated all existing programs and activities on the Idaho Panhandle National Forest, stating which ones are compatible with lynx management and which will require further consultation with the U.S. Fish and Wildlife Service.

PEREGRINE FALCON

The only peregrine falcon nest on the forest was monitored; it produced two chicks.

Table 18. Peregrine Falcon Nests

# of peregrine falcon nests monitored	# of peregrine falcon nests occupied	# of peregrine falcon chicks fledged
1	1	2

ELK HABITAT POTENTIAL

Elk habitat potential was unchanged on the Idaho Panhandle National Forests from 1999.

Table 19. Elk Habitat Potential

District	Existing Habitat Potential	District Standard (Goal)
Wallace	54%	52% or higher
Fernan	52%	48% or higher
Avery	64%	65% or higher
St. Maries	62%	53% or higher

Whitebark Pine

Whitebark pine occupies the highest elevation and most severe high mountain sites in our ecosystem. It grows in isolated populations along the highest mountain and ridge tops, often separated by many miles of lower elevation ground from the next nearest whitebark population. In same places it grows in mixtures with subalpine fir, Englemann spruce, and/or mountain hemlock. But at the highest elevations, it may be the only tree that can tolerate the severe conditions. Here, whitebark pine may effectively raise the tree line several hundred feet in elevation above where it might otherwise be. Whitebark pine has large, nutritious seeds that are an important food source for grizzly bear, black bear, Clark's nutcrackers, and red squirrels.

Whitebark pine is a shade-intolerant trees species that requires canopy openings for regeneration. Although whitebark pine trees are not highly resistant to fire, it responds by regenerating well after fire. Low severity surface fires also likely give it some advantage over subalpine fire and spruce. Where whitebark pine grows in combination with spruce and fir, if there is no canopy-opening disturbance over time, whitebark pine will eventually be replaced by virtually pure subalpine fir.

Whitebark pine is extremely sensitive to the introduced disease, white pine blister rust. It is also naturally subject to periodic mountain pine beetle outbreaks that kill many trees. Historically, the regular summer forest fires provided opportunities for whitebark pine to regenerate after mountain pine beetle had reduced its population. However, now populations (and seed production potential) of whitebark pine are already significantly reduced by blister rust. After mountain pine beetle goes through these weakened stands, there may be little to no mature whitebark pine left. And, fire suppression may remove the regeneration opportunity for whitebark pine. When blister rust, the effects of fire suppression, and the impact of mountain pine beetle come together, whitebark pine can be virtually eliminated from some mountain ridge systems. This pattern of loss is exactly what we suspect is happening in some high elevation areas.

The largest and most continuous whitebark pine population left in the entire northern Idaho Panhandle is on the high ridges in the northern Selkirk Mountains. Although this population has suffered a slow decline from blister rust, it was clearly the best whitebark pine left in this landscape, and the whitebark population was quite large.

Aerial surveys in late summer of 1999 brought news of a significant mountain pine beetle outbreak in the northern Selkirk's whitebark pine. During the summer of 2000 we began to do bark beetle ground survey work in the northern Selkirks, and found that the mountain pine beetle outbreak was very large and killing a high percentage of the mature trees in some areas. Poor access and a short field season limited our ability to fully assess this outbreak, but we know it's quite serious. In 2001 we plan on doing more extensive ground survey work, and will evaluate options to at least provide regeneration opportunities for whitebark pine that may be developing some blister rust resistance.

Fire

To sustain the diversity of our forests we need to understand the natural disturbance processes that historically shaped these ecosystems. Fire history studies in the Coeur d'Alene Basin indicate that between 1542 and 1931, a major fire event (a fire or fires cumulatively covering at least 20,000 acres) occurred somewhere every 19 years on the average. For example, in the Coeur d'Alene Basin major fire events occurred in 1931, 1926, 11919, 1910, 1904, 1896, 1889 (may have been larger than the 1910 fire), 1878, 1870, 1859, 1844, 1830, 1814 (burned 1/3 of the basin), 1790, 1772, 1764, 1654, 1580 and 1542.

A combination of both mixed severity and stand replacing fires were the dominant disturbance force shaping the historic natural forest. Stand replacing fires cause high mortality in canopy trees throughout most of the stand. Mixed severity fires have varying effects on the canopy, both lethal and non-lethal, and produce irregular, patchy mosaics. Low severity fires cause little mortality in mature trees, but clear out small understory trees, and dead woody fuels on the forest floor.

Before the arrival of Europeans, the mid elevation hillsides of the IPNF were covered with mixed conifer forests. Western white pine comprised roughly 35% of the forest, with western larch, ponderosa pine, and Douglas-fir as the other most common trees. These tree species are adapted to both wildfire and droughts, and these forest types were largely created and maintained by forest fires. Grand fir and hemlock were also present, but these species are more fire and drought sensitive, and consequently were less common. The sites along rivers and in stream side zones burned less frequently and less severely, and were commonly dominated by large old growth western red cedar.

The drier sites and lower elevations on south facing slopes and on the Rathdrum Prairie burned more frequently, but usually with low severity fires. On these drier sites, open stands of large ponderosa pine, larch, and Douglas-fir were common and were maintained by low-intensity ground fires. These species mixes and forest communities evolved with wildfire disturbance as the predominant force of change.

Over the past 55 years, as a result of fire suppression, the introduction of white pine blister rust in the early part of the century, and past timber harvest practices, the IPNF has seen major changes in forest tree species composition and structure. Blister rust has been one of the most significant factors. This introduced disease killed over 90% of the formerly dominant white pine, creates risks to the continued local persistence of whitebark pine, and has pushed forest succession toward fir and hemlock forests.

Fire suppression has also changed the landscape. Extrapolating from a fire study of the Coeur d'Alene Forest, the historic mean fire return interval for stand replacing fires was approximately 190 years. Given the 2.5 million acres of the Idaho Panhandle National Forests an average historic fire year would have burned approximately 31,000 acres. Of these average historic annual burned acres, approximately 13,000 acres would have

burned in stand replacing fires, and 18,000 acres would have burned in low and mixed severity fires.

Table 20 shows wildfire occurrence data for the IPNF. For 1969 through 2000 the total number of fires per year ranged from 44 in 1993 to 586 in 1994. We averaged approximately 164 fires per year; 70% of these were lightning-caused. The data for total number of wildfire acres burned per year shows that during this period the total number of acres burned per year varied from 4 in 1993 to 3,221 in 1970. Wildfires burned an average of 711 acres per year; this is about 2.3% of what would have been generated as a long-term running average by historic natural processes.

Wildfires are now largely suppressed by human beings (especially low and mixed severity fires). In 2000, the IPNF responded to 184 wildfires that were suppressed after burning 2756 acres. About 85% of the fires were natural (lightning caused) and 15% were human caused. There were 3,275 acres of harvest related fuel treatment and 7,802 acres of hazardous fuel reduction.

For the 14 years since the Forest Plan was adopted (1987-2000), the IPNF has responded to 2190 wildfires, which burned 10,354 acres. Our last major stand replacing wildfire occurred in 1967. Without human suppression, over a historically typical 14-year period, wildfires might have burned 434,000 acres (although only 182,000 would have been stand replacing fires).

Wildfire vs. Human Disturbance

With the suppression of wildfire, human timber harvest and prescribed burning are the primary vegetation disturbance forces shaping the landscape. In terms of converting vegetation to an early successional condition, regeneration timber harvests partially imitate the effects of stand replacing fire. In terms of thinning stands, partial cut harvests partially imitate the effects of mixed severity fires. Human induced vegetation disturbance from timber harvest opens a much smaller number of acres than we would have expected from historic wildfire regimes. This combined with white pine blister rust is converting the forest to dominance by fire and drought sensitive firs and hemlock.

Overall, since 1940 we have been very successful at eliminating wildfires as a major ecological process on the IPNF. We're still working at understanding how this balances with the large number of wildfire acres burned during the drought years between 1910 and 1934.

Although we're cutting fewer acres than we would have expected to burn from naturally occurring wildfires, the widely dispersed nature of our harvests has impacted a large number of watersheds. Where historic wildfires would have burned large patches, our harvests have been laid out in 5 to 40 acre openings scattered over a much broader area.

Extensive road systems are used to access and link these harvest patches. Thus, both the watershed and visual impacts of our harvest systems exceed what we'd expect simply from the number of acres harvested.

Today 90%+ of the historic white pine forest has been lost, and the amount of larch has been significantly reduced. The large open grown ponderosa pine stands are largely gone. These formerly dominant forest species have largely been replaced by grand fir, Douglas-fir, and western hemlock, which have doubled or tripled in their coverage. These new forests of fir and hemlock are much more drought and fire sensitive than the historic forest, and are at elevated risk from root disease, bark beetles, and defoliating insects. The Scientific Assessment of the Interior Columbia Basin identified this conversion to dominance by late seral tree species as both a cause of increased susceptibility to severe fires, insects and pathogens, and a basin-wide concern.

In some places, root diseases have been converted from their historic ecological role as thinning agents, to a new role as significant disturbance agents shaping the landscapes. In the Coeur d'Alene Basin, extremely high root disease mortality rates are creating large-scale forest canopy openings and accelerating succession towards drought and fire sensitive grand fir and hemlock. On drier sites, in place of the stands of large, open ponderosa pine, we now have dense stands of lodgepole pine, or a mix of firs that is at high risk from potentially very severe wildfires.

Table 20. Fire Occurrence

FISCAL YEAR	Lightning Fires	Person Fires	TOTAL FIRES	Lightning Acres	Person Acres	TOTAL ACRES
1969	37	71	108	96	171	267
1970	267	61	328	51	3,170	3,221
1971	105	46	151	49	112	161
1972	148	33	181	7	117	124
1973	69	86	155	13	1,526	1,539
1974	158	120	278	183	1,735	1,918
1975	58	43	101	9	70	79
1976	59	47	106	2	84	86
1977	188	79	267	23	67	90
1978	40	31	71	5	47	52
1979	201	120	321	110	2,585	2,695
1980	52	23	75	10	12	22
1981	94	48	142	10	14	24
1982	91	49	140	13	20	33
1983	24	35	59	0	374	374
1984	182	72	254	33	16	49
1985	93	44	137	771	12	783
1986	125	46	171	31	852	883
1987	56	70	126	11	274	285
1988	58	57	115	316	706	1,022
1989	99	39	138	92	86	178
1990	48	49	97	5	140	145
1991	76	46	122	11	2,530	2,541
1992	106	31	137	20	397	417
1993	23	21	44	1	3	4
1994	530	56	586	2,417	74	2,491
1995	56	31	87	8	15	23
1996	87	30	117	30	290	320
1997	66	12	78	11	6	17
1998	166	32	198	60	2	62
1999	127	34	161	20	67	87
2000	27	184	157	2,756	6	2,762
Total	**3,646**	**1,589**	**5,235**	**7,174**	**15,580**	**22,754**

APPENDICES

A. Forest Plan Monitoring Requirements

B. Forest Plan Amendments

C. List of Contributors

Appendix A. Forest Plan Monitoring Requirements

Table 21. Forest Plan Monitoring Requirements

Item Number	Standards, Practices, Activities, Outputs or Effects to be Monitored	Data Source	Frequency of Measurement	Reporting Period	Threshold to Initiate Further Action
A.	All RESOURCE ACTIVITIES				
A-1	**Quantitative estimate of outputs and services**	Annual program accomplishment report	Annually	Annually	A trend established after 5 years that indicates less than 80% of Forest Plan goal has been accomplished
A-2	**Effects of other government agency activities on the national forests and the effects of National Forest Management on adjacent land and communities**	Other agency plans	Annually	Annually	When other agency programs affect attainment of Forest Plan Goals

B.	TIMBER				
B-1	**Harvested lands restocked within 5 years**	Stand records	1,3,5 years	5 years	10% of harvest lands not adequately restocked 5 years following site preparation
B-2	**Timberland suitability**	Timber stand data base and forest data base, EAs	5 years	5 years	10% change in timberland currently classed as physically suitable
B-3	**Validate maximum size limits for harvest areas**	EAs	5 years	5 years	10% of openings exceed Forest Plan size limits
B-4	**Insect and disease hazard**	Insect and disease surveys	5 years	5 years	Insect and disease conditions are predicted to reach epidemic or serious levels on 5 % of the Forest
B-5	**Road construction**	Timber appraisals, construction contracts	Annually	5 years	Unit costs exceed estimates by 20% in two or more years
B-6	**Actual sell area and volume**	Cut and sold reports	Annually	5 years accumulation	Sell volume and acres less than 75% of FP goal

C.	VISUAL RESOURCES				
C-1	**Meeting visual quality objectives**	EAs, field sampling	Ongoing	Annually	10% departure from Forest Plan direction after 5 years initiates further evaluation
D	RECREATION				
D-1	**Off-road vehicle effects**	Field evaluation, travel plan	Continuing	Annually	Conflicts with management area goals or between users
E	CULTURAL RESOURCES				
E-1	**Measure potential impacts of land disturbing projects on known cultural resources**	Field monitoring	Annually	Annually	Any unmitigated adverse impact
F	WILDLIFE				
F-1	**Population trends of management indicator species**	State Fish and Game Dept	Annually	5 years	Downward population trends
F-2	**Grizzly bear recovery objectives**	Idaho Fish and Game, USFWS	Annually	Annually	Not working toward recovery

F-3	**Caribou recovery objectives**	Idaho Fish and Game, USFWS	Annually	Annually	Not working toward recovery
G	WATER AND FISH				
G-1	**Greater than 80% of potential emergence success**	58 streams monitored at 29 streams per year	2 years	Annually	When more than 10% of high value streams – below 80%. When more than 20% of important streams – below 80%. A 4 year declining trend on any stream
G-2	**Are BMPs protecting water quality, are they: implemented as designed; effective in controlling nonpoint sources of pollution; protecting beneficial uses.**	Baseline stations on 11 streams. Implementation 10% timber sales; Effectiveness on-site 0ff-site measurement; WATSED validation	Annually	Annually	1 – used for resource characterization and background data for predictive purposes 2- Evaluate 10% of timber sales per year. Deviation from prescribed BMPs;

					3- Ineffective on-site nonpoint source pollution control. Off-site watershed system degrading due to lack of effectiveness of BMPs in use. 4 – Actual more than plus or minus 20% of model prediction
G-3	**Validate fish habitat trends**	Stream surveys	Annually	5 years	A declining trend in habitat quality
G-4	**Fish population trends**	Cooperative with Idaho Fish and Game	2 years	2 years	Downward trend
H	THREATENED AND ENDANGERED PLANTS				
H-1	**Threatened and endangered plants**	Field observations incidental to project planning	Annually	Annually	Any plan adversely affected.

I	MINERALS				
I-1	**Environmental concerns affect operating plans**	Open plan compliance checks	Minimum one inspection of operating plan active season	Annually	Exceeds any Forest Plan Standard; any amend operating plan
J	LANDS				
J-1	**Land ownership adjustments**	EAs for land exchanges, land ownership records	Annually	5 years	Program is not contributing to Forest Plan goals. Less than 75% of program accomplishment.
K	ENVIRONMENTAL QUALITY				
K-1	**Prescriptions and effects on land productivity**	Field reviews	Annually	Annually	Non-compliance with BMPs or significant departure or effects significantly different than predicted

Appendix B. Forest Plan Programmatic Amendments

The Idaho Panhandle Forest Plan Record of Decision was signed in September 1987. Since then there have been a number of programmatic amendments to the plan. Programmatic amendments change Forest Plan direction for the duration of the Plan. These amendments can be based on a Forest-wide, area, or a project specific analysis that supports the need for change. Programmatic amendments may be proposed as a result of new information or changed conditions, actions by regulatory agencies, monitoring and evaluation, or landscape analysis. These amendments may affect Forest-wide or management area direction.

The following programmatic amendments have changed the 1987 IPNF Forest Plan. They are listed in chronological order.

1) The first amendment to the Forest Plan was signed on September 8, 1989. The purpose of this amendment was to incorporate the document "Idaho Panhandle National Forests Water Quality Monitoring Program", Appendix JJ, as agreed to with the State of Idaho in the Joint Memorandum of Understanding dated September 19, 1988, and replace Forest Plan Appendix S (Best Management Practices) with Forest Service Handbook 2509.22 (Soil and Water Conservation Practice Handbook).

2) On March 12, 1991, the Regional Forester issued a Decision to Partition the allowable sale quantity (ASQ) into two non-interchangeable components, the quantity that would come from inventoried roadless areas and the amount that would come from existing roaded areas. This amendment applied to 11 of 13 Forest Plans in Region One.

3) On August 21, 1992 agreement was reached with American Rivers on an amendment that clarified the Forest's intent to protect eligible Wild and Scenic Rivers until suitability studies were completed.

4) The next amendment was signed on December 7, 1994. The purpose of this amendment was to comply with the Arkansas-Idaho Land Exchange Act of 1992. Through this land exchange, the IPNF acquired a total of 10,026 acres of land (9,114.44 acres from the Bureau of Land Management (BLM) and 912.1 acres from Potlatch Corporation). In turn, the IPNF disposed of 7,978.91 acres to Potlatch Corporation. The Act directed the IPNF to manage those lands acquired within the boundaries of the BLM's Grandmother Mountain Wilderness Study Area to preserve the suitability for wilderness until the Forest completes a wilderness study as part of its Forest Plan revision process.

5) Another amendment is associated with the Interim Strategies for Managing Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, Western Montana and portions of Nevada (Inland Native Fish Strategy). This interim direction is in the form of riparian management objectives, standards and guidelines, and monitoring requirements. This action amends the management direction established in the Regional Guides and all

existing land and resource management plans for the area covered by the assessment. The Decision Notice for the Environmental Assessment that covered this amendment was signed by the Regional Foresters for the Northern, Intermountain and Pacific Northwest Regions on July 28, 1995.

6) The most recent amendment updated standards and guidelines for management of the Salmo-Priest Wilderness Area. This amendment applied to both the Colville and Idaho Panhandle National Forests portions of the wilderness area. The Decision Notice was signed by the Colville NF Supervisor on November 20, 1995, and the IPNF Supervisor on January 23, 1996.

Appendix C. List of Contributors

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