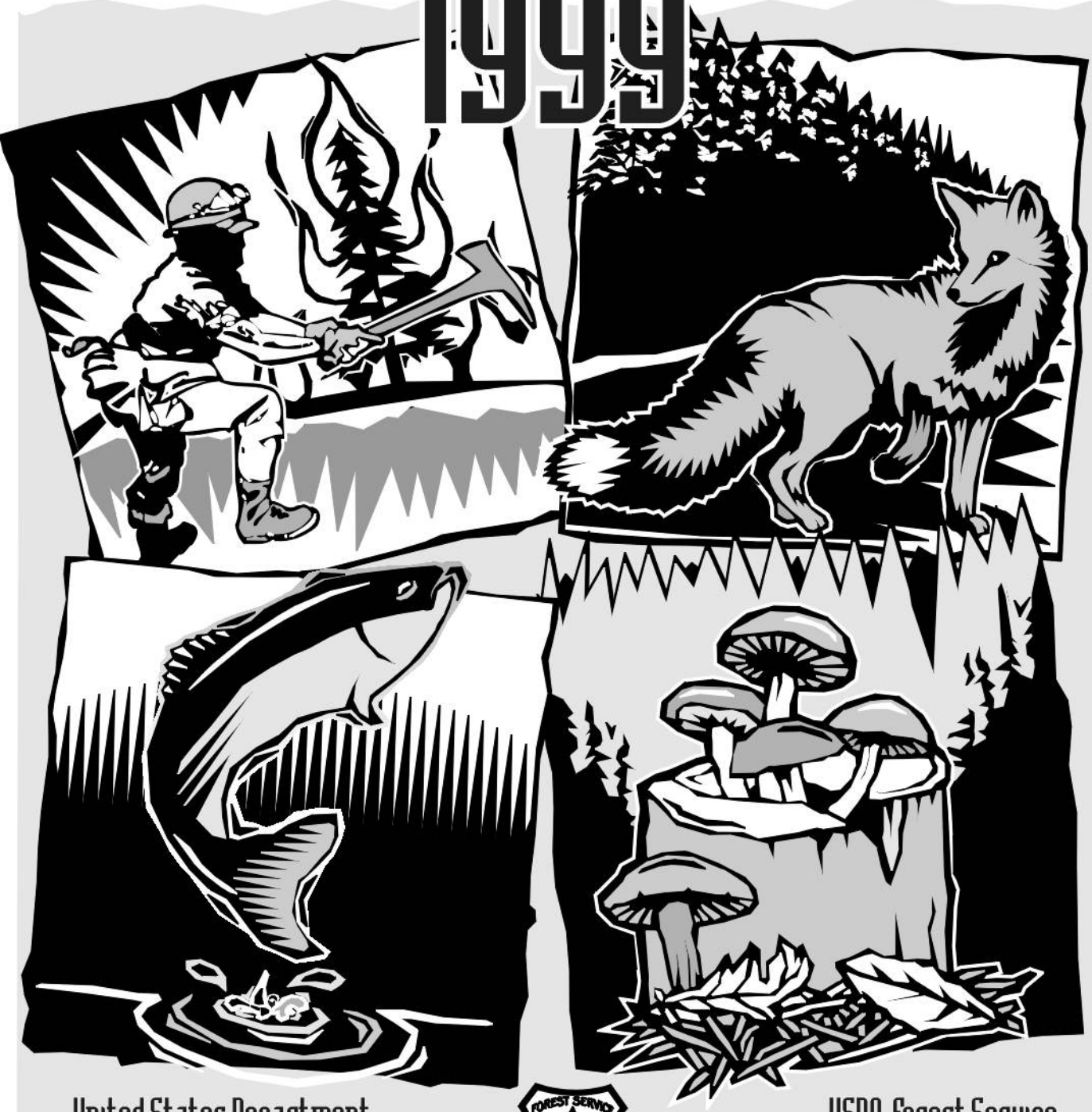
Idaho Panhandle National Forests

Forest Plan Monitoring and Evaluation Report

1999



United States Department of Agriculture

USDA Forest Service
Northern Region

1999 FOREST PLAN MONITORING AND EVALUATION REPORT
IDAHO PANHANDLE NATIONAL FORESTS
Issued November 2000

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I. INTRODUCTION

The Record of Decision for the Forest Plan for the Idaho Panhandle National Forests (IPNF) was signed on September 17, 1987. The monitoring and evaluation portion of the Plan is found on pages IV-7 through IV-13.

Monitoring and evaluation each have a distinctly different purpose. Monitoring is designed to gather the data necessary for the evaluation. The evaluation is used to determine if the implementation of the Forest Plan is within the bounds of the plan. Monitoring and evaluation provide information to the decision maker and the public on the progress and results of implementing the Forest Plan. The monitoring and evaluation process compares the end results being achieved to those projected in the Plan.

One of the requirements in the IPNF Forest Plan is that a monitoring and evaluation report be prepared annually. Reports have been prepared for each year from 1988 through 1999. Calling 208-765-7223 or sending a written request to the following address can obtain copies of these reports:

Forest Planner
Idaho Panhandle National Forests
3815 Schreiber Way
Coeur d'Alene, ID 83815-8363

(The monitoring reports for 1998 and 1999 are also available on our website:)

www.fs.fed.us/ipnf/eco/manage.html

The Forest Plan identified twenty-two monitoring and evaluation items. Monitoring requirements for each of these is given in the table in Appendix A.

The Forest Plan requires that twelve of the twenty-two monitoring items be reported every year, one be reported every two years, and nine be reported every five years. Since all twenty-two were reported in 1998, only the twelve with annual reporting periods are included in this year's report. These are:

A-1 Outputs of Goods and Services
A-2 Agency Effects
B-6 Actual Sell Area and Volume
C-1 Meeting Visual Quality Objectives
D-1 Off-Road Vehicle Effects
E-1 Impacts of Land Disturbing Projects on Cultural Resources
F-2 Grizzly Bear Recovery Objectives
F-3 Caribou Recovery Objectives
G-2 Water Quality/BMPs
H-1 Threatened and Endangered Plants
I-1 Adequacy of Mining Operating Plans
K-1 Prescriptions and Effects on Land Productivity

The 1999 report also includes information on a number of topics not required by the Forest Plan but important to Forest management. These include ecosystem restoration, old growth, roadless areas, lynx, and fire occurrence.

II. SUMMARY OF KEY FINDINGS FOR 1999

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 said 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 1999, 63.4 MMBF was offered, 30.3 MMBF was sold, and 57.6 MMBF was harvested. The number of acres sold was 8,751. Payments to counties in 1999 totaled $3,122,296.

- 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 are not yet available and so will be reported in the FY2000 Monitoring Report.

- The grizzly bear population on the IPNF is estimated to be increasing by about 2 to 2.5% per year. The limiting factor for recovery of grizzly bear populations is direct mortality from people shooting bears, especially during hunting season.

- The population trend for woodland caribou is down, although the last two years mortalities have been fewer than in previous years. Predation and limited amounts of early winter habitat are believed to be the most significant limiting factors for caribou at this time.

- In 1999 38 projects were monitored for compliance with Forest Plan visual quality objectives. Ninety five percent were in compliance.

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

- The Forest reported (and the state Historic Preservation Office reviewed) thirteen timber sale projects. It was determined that all of these proposed timber sales would have no effect on heritage resources. The Lakeface Lamb Fuel Hazard Reduction Project will be monitored to insure there is no effect on heritage

resources. A proposed toilet installation at Priest Lake was found to potentially impact a prehistoric site. Studies are being undertaken to find another location so the heritage site will not be impacted.

- In December of 1999 the U.S. Fish and Wildlife Service proposed listing the plant Silene spaldingii (Spalding's catchfly). Some habitat for this species exists on the Idaho Panhandle National Forests. Broad-scale and project level surveys are planned for the 2000 field season to validate predicted habitat and search for populations. Biological Assessments currently are addressing Silene as a proposed species following requirements in the Endangered Species Act and Forest Service Policy.

- Forest monitoring of Best Management Practices indicates that in most cases they functioned as expected and met their intent. Some concerns and areas for follow up were identified. Updated information is also provided on some projects described in previous monitoring reports.

- The Forest has eight long-term water quality monitoring stations. During 1999 the data from three of these stations (Halsey Creek, Big Elk Creek, and Long Canyon Creek) was analyzed to compare measured sediment with that predicted from the WATSED model. The findings indicate that the WATSED measured responses for the three watersheds are within a reasonable range. They also suggest that natural sediment loads, both measured and predicted are close, with the exception of Halsey Creek. In two cases, the recovery relationships for predicted suspended loads appear to be higher than expected or measured. In the next 2-3 years the data from the other five long-term water quality monitoring stations will also be analyzed.

- 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 1999 are listed below. See the Ecosystem Restoration section of this report for more details.
    - Planting over 552,000 rust resistant white pine seedlings,
    - Planting approximately 6,012 acres of white pine, larch and ponderosa pine. These are species that are in short supply on the IPNF. (This figure is greater than the 4,023 figure given in Table 1 for Total Reforestation Acres because of the way the data base computes acres planted for each species. Since more than one of these species may be planted in the same unit the data base credits each species as being planted on the same number of acres as are in that unit).
    - Reducing stocking by thinning 2891 acres; most of this released larch, white pine and ponderosa pine,
    - Restoring the role of fire in the Forest's ecosystems by 11,964 acres of prescribed burning,
    - Improving 713 acres of soil and water resources, and
    - Obliterating 110 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 1999.

III. FOREST PLAN REVISION

Some of the monitoring items discussed in this report will be major topics addressed during forest plan revision. Many National Forests, including the Idaho Panhandle National Forests, are approaching the time when Forest Plans are to be revised. When the IPNF will actually begin the revision process will depend on the amount of money appropriated and the order in which Forests are selected. At the present time the date the Forest will begin revision is not known.

IV. SUMMARY OF FINDINGS FOR EACH FOREST PLAN MONITORING ITEM

This section contains the monitoring and evaluation results for 1999 for each of the twelve monitoring items discussed in this year's report.

Forest Plan Monitoring Item A-1: Quantitative Estimate of Performance Outputs and Services For 1999 – Table 1

The following is a list of some of the major outputs and activities that occurred on the Idaho Panhandle National Forests during FY99.

Budget	$34,584,881
Total number of employees	526 (permanent and temporary)
Volume of timber offered	63.4 million board feet
Volume of timber sold	30.3 million board feet
Volume of timber harvested	57.6 million board feet
Total receipts	$12,762,653
Payments to counties	$ 3,122,296
Total reforestation completed	4023 acres
Total number of seedlings planted	1,324,312
Timber stand improvement completed	2891 acres
Soil and water improvement completed	713 acres
Roads maintained	2,902 miles
Roads constructed	5 miles
Roads reconstructed	74 miles
Roads obliterated	110 miles
Trails constructed/reconstructed	20 miles
Number of wildfires	161 fires
Acres burned by wildfire	87 acres
Harvest related fuel treatment	2,323 acres
Hazardous fuels reduction (Non-Harvest Related Fuels)	9,641 acres
Wildlife habitat restored	2046 acres
Wildlife habitat inventoried	1053 acres
TES terrestrial habitat restored	277 acres
TES structures constructed	29 structures
TES terrestrial habitat inventoried	179,444 acres
TES stream habitat inventoried	26 miles
Noxious weeds treated	1,765 acres
Grazing allotments administered	5
Rangeland Monitored/Evaluated	1500 acres
Range non-structural improvements completed	50 acres
Abandoned mines reclaimed	28

Forest Plan Monitoring Item A-2: Effects of Other Government Agencies on the IPNF, and the Effects of National Forest Management on Adjacent Land and Communities

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. Comparison of Payments to Counties with Harvested Timber Volume for 1988-1999

Year	Payments (MM$)	Volume harvested (MMBF)
1988	4.6	253
1989	5.0	263
1990	5.9	280
1991	5.4	232
1992	7.4	235
1993	6.0	134
1994	6.4	116
1995	5.8	87
1996	6.0	81
1997	3.9	57
1998	4.8	85
1999	3.1	58

Table 3. Distribution of payments to counties, 1988-1999.

County	**FY88**	**FY89**	**FY90**	**FY91**	**FY92**	**FY93**	**FY94**	**FY95**	**FY96**	**FY97**	**FY98**	**FY99**
Benewah	39,898	49,995	79,053	65,777	71,747	78,926	60,217	60,294	56,152	45,610	31,051	9,243
Bonner	829,648	685,852	894,346	830,257	1,229,474	823,120	929,071	966,681	880,735	491,055	761,712	732,841
Boundary	897,648	725,789	969,688	895,881	1,330,307	885,433	1,003,376	1,060,285	954,333	529,089	823,583	816,527
Clearwater	3,976	5,206	8,232	6,869	7,492	8,242	7,130	6,929	6,452	5,257	3,579	1,065
Kootenai	551,999	742,944	613,531	645,371	905,926	689,921	826,323	619,058	800,937	492,483	696,058	363,068
Latah	18,392	24,093	38,097	31,787	34,672	38,141	32,853	31,908	29,716	24,212	16,483	4,906
Lincoln, MT	41,875	33,776	45,127	41,692	61,909	41,192	46,624	49,267	44,186	24,498	38,160	37,707
Pend Oreille, WA	224,307	180,923	241,726	223,327	333,409	221,838	251,092	265,328	237,964	131,936	205,511	203,071
Sanders, MT	11,932	9,624	12,858	11,879	17,640	11,737	13,285	14,038	12,590	6,980	10,873	10,744
Shoshone	1,947,324	2,601,931	3,024,285	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
Totals	**4,566,999**	**5,060,133**	**5,926,943**	**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**

Evaluation: Table 3 depicts how receipts have been distributed to counties for the past 12 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 1999 was collection of $12,762,653. Timber volume harvested in 1999 was 58 million board feet, down about 27 million board feet from 1998. Receipts to counties in 1999 totaled $3,122,296 down $1,635,752 from 1998.

The receipts to counties over the past 12 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

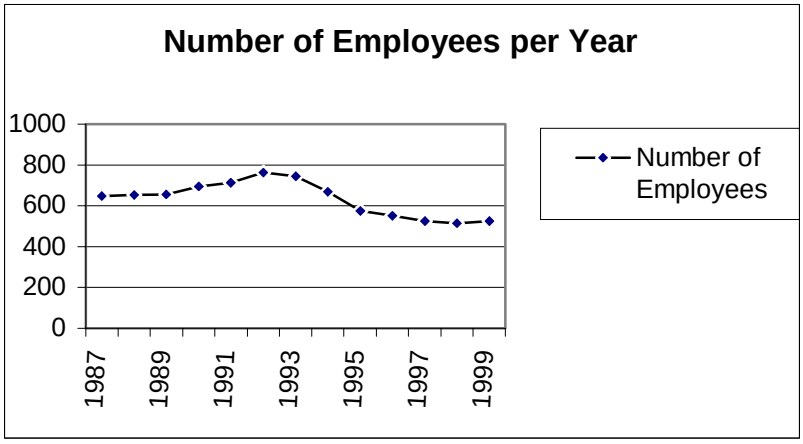
The people who work for the Idaho Panhandle National Forests spend money and contribute to the economy of the communities in which they live. As Forest Service employment goes up and down the amount of money contributed to the local economy also varies.

Monitoring Data

Table 4. Total employees per fiscal year

Year	Total Number of Employees
1987	648
1988	653
1989	655
1990	695
1991	714
1992	762
1993	743
1994	669
1995	575
1996	552
1997	525
1998	514
1999	526

Figure 1: Number of Employees Per Year



Evaluation: Table 4 and Figure 1 show the way our workforce has changed from 1987 to 1999. We went from a total of 648 people (permanent and temporary employees) in

1987, to a high of 762 in 1992, to 526 at the end of fiscal year 1999. This loss of employment has likely had a greater affect on the smaller communities such as Bonners Ferry, Wallace and St. Maries than has been the affect on communities like Coeur d' Alene and Sandpoint where more 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

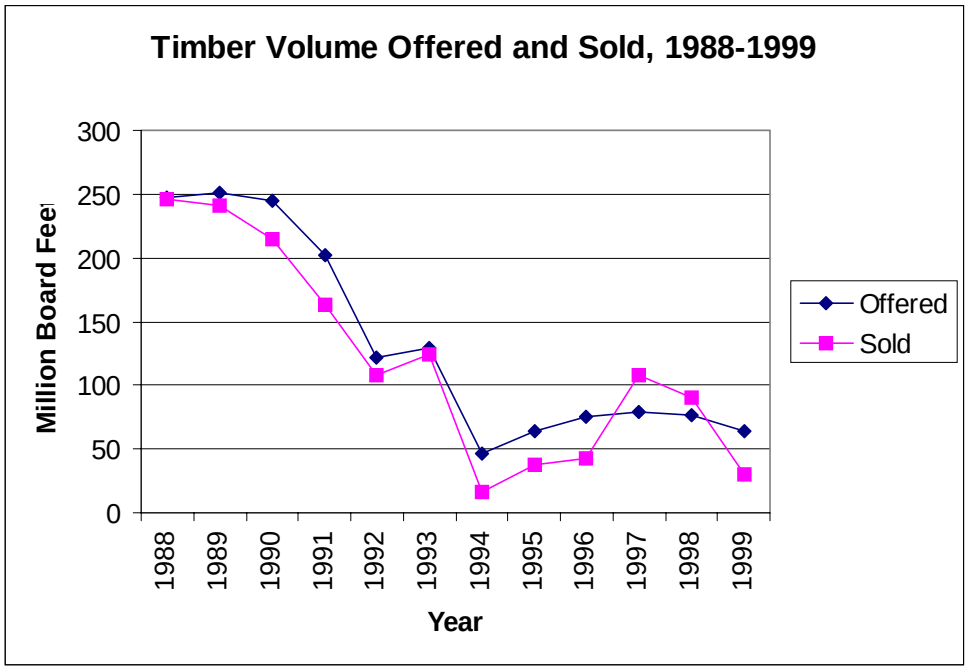
1999: For this fiscal year the Idaho Panhandle National Forests offered 63.4 million board feet of timber for sale. We sold 30.3 million board feet.

1988-1999: Table 5 depicts timber volumes offered and sold, and sale acreages for the past 12 years. Figure 2 that follows it graphically presents trends in volumes offered and sold.

Table 5. Timber volumes offered and sold on the IPNF (million board feet)

Fiscal Year	Volume Offered	Volume Sold	Total Acres Sold
1988	247.7	246.4	15,798
1889	251.4	240.4	13,790
1990	244.9	214.8	16,307
1991	201.6	163.2	13,989
1992	121.8	108.0	10,508
1993	129.4	124.3	13,939
1994	46.5	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

Figure 2. Timber Volume Offered and Sold, 1988-1999



Evaluation

For 1988 through 1990 the volume of timber sold and acres sold exceeded the 75-percent threshold identified in the Plan. From 1990 through 1999 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 been largely un-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: Meeting Visual Quality Objectives

The purpose of this monitoring item is to determine if project activities meet Forest Plan visual quality objectives. The threshold for further action is if more than 10 percent of monitored projects in a five-year period depart from adopted visual quality objectives.

Monitoring Data

Table 6. Timber Sales Closed in FY 1999

Timber Sale Name	VQO's Met	Remarks
2 Mile Blowdown	Yes	
Ponderosa Connection	Yes	
Pref Snow & Wind	Yes	
Rd 597G Salvage	Yes	
Bear Paw Salvage	Yes	
McLamb Salvage	Yes	
Nordman LP	No	Change from original prescription by sale adminisrator to allow landing locations which were not compatible w/ VQO's
Castro Triangle	Yes	
Pure Paw	Yes	
Road 2298	Yes	
Binarch Ridge	Yes	
Snow Goose	Yes	
Buck Ranch	Yes	
Rocky Vista	Yes	
ComplacerC Thin	Yes	Commercial thin and salvage harvesting.
Snow Creek	Yes	Commercial thin and salvage harvesting.
Tungengroove Roundwood #2	Yes	Commercial thin harvesting.
Tungengroove Roundwood #5	Yes	Commercial thin harvesting.
Pouch Blowtato Salvage	Yes	Blowdown salvage.
Trapper Salvage	Yes	Understory removal and blowdown salvage.
Yellow Belly Salvage	Yes	Blowdown salvage.
Big Aspen Salvage	Yes	Blowdown salvage.
Wall Meadow	Yes	Commercial thin and salvage harvesting.
Poleder I	Yes	Commercial thin and group selection harvest.
Poleder II	Yes	Commercial thin and group selection harvest.
Poleder III	Yes	Commercial thin and group selection harvest.
Broundwood II Salvage	Yes	Blowdown and standing dead salvage.
Short Reunion Salvage	Yes	White pine salvage.
Clipper Salvage	Yes	Blowdown salvage.
BolderOver Salvage	Yes	Blowdown salvage.
Harvey II Salvage	Yes	Blowdown and standing dead salvage.
Kyle Creek Slavage	Yes	Sale was within existing Arid Cedar T.S. units
Pt Henry		Decision Memo, visuals not addressed
Fir for All	Yes	
Beetle Mania Salvage	Yes	
Whistling Creek Deck	Not required	Trespass sale of confiscated material
Two Buttes Helicopter	Yes	Fire had affect on unit #8 after sale operations
Willow	No	Forest Landscape Architect is involved in reanalyzing to meet VQO's
White Castle Firewood 1-6	Yes	

Table 7. Timber Sales Sold in FY 1999

Timber Sale Name	Should Sale meet Forest Plan VQOs
Priest Lake	
Castro Triangle	Yes
Art's project	Yes
Fedar WP	Yes
Nordman Powerline	Yes
Quartz/ Jasper	Yes
PREF Rehab	Yes
Flat Moores	Yes
Tola	Yes
Four Corners	Yes
Kalispell Sewer	Yes
PREFBDY	Yes
Bonners Ferry	
Katastrophe	Yes
Kat Tail	Yes
Katatonic	Yes
Along Haul Salvage	Yes
Good Grief Addie	Yes
Kitkatkee	Yes
South Zone	
Charlie Flight	Yes
Whistling Creek Decks	No – Trespass sale
Get Shorty	Yes
Golden Wind	Yes
Charlie Horse	Yes
White Castle Firewood 1-6	Yes

Table 8. Meeting Visual Quality Objectives As Planned

Year	Number of Planned Projects	Number of Projects Meeting VQOs	Departure from Direction
1998	33*	33	0%
1999	23*	23	0%
Total	**56**	**56**	**100%**

*Of reported sales sold

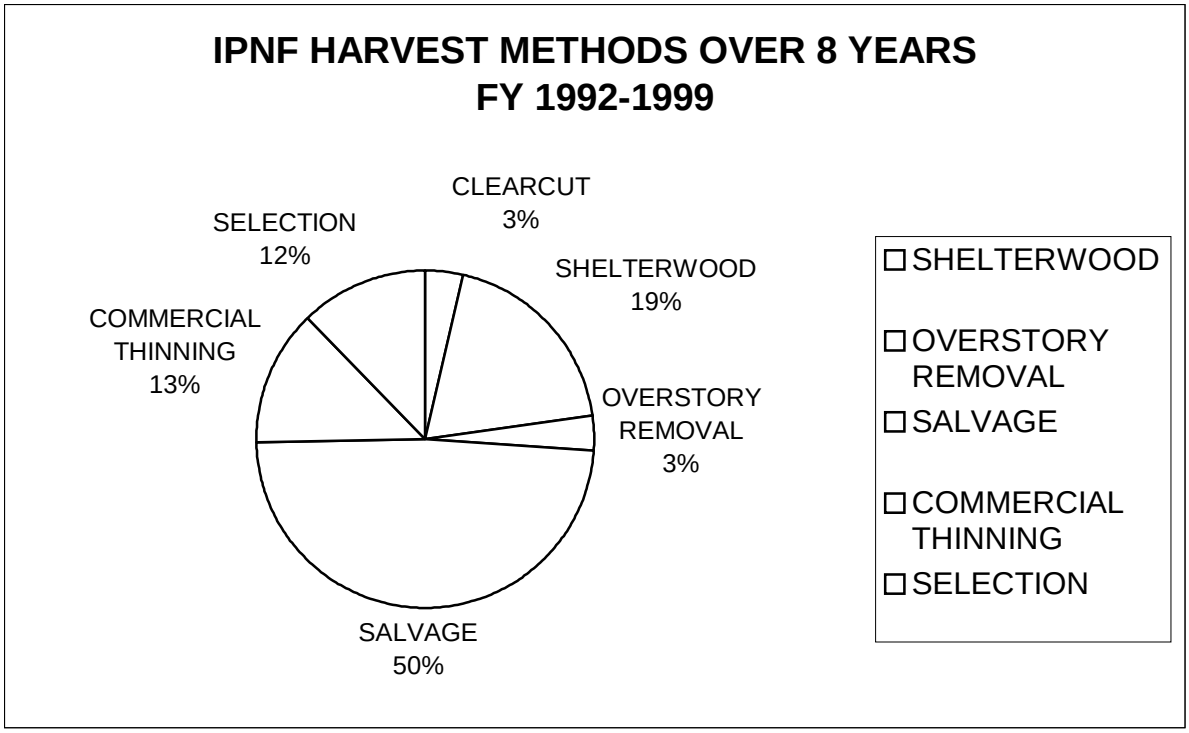
Table 9. Number of Projects Closed and Percent that Comply with Forest Plan

Year	Number of Projects Closed	Forest Plan Compliance
1998	23	96%
1999	38	95%

The following graph shows the distribution of harvest methods on the IPNF in the eight-year period, from 1992 through 1999. Since the inception of the Forest Plan in 1987, there has been a movement away from aesthetically impactive harvest methods towards the use of methods that result in more natural appearing landscapes that are not only aesthetically more compatible with their surroundings, but are also less environmentally

impactive. These methods include shelterwood harvest, overstory removal, salvage harvest and selection harvest methods.

Figure 3. Harvest Methods Used, FY92-99



Evaluation

Nineteen percent of the acres were harvested using the shelterwood approach. Projects using this harvest method have not increased during the last year. This is a positive trend for scenery management in areas of visual significance on the IPNF, as a natural appearance is rarely achieved when this harvest method is used. Shelterwood is used to promote regeneration and establishment of new stands under the protection of a partial tree canopy. Following a minimum of two harvests, the resulting product is an even-aged stand with continuous coverage.

Salvage harvest methods were used on half of the acres harvested on the IPNF in the eleven years from 1992-1999. This is a 6% increase since 1998. Natural appearing landscapes typically result from use of this harvest method in which only the dead, dying or deteriorating trees in a stand are removed. A high level of visual quality results with the variety of color, form, texture and size resulting with this harvest method. Commercial Thinning was the method used to harvest 13 % of forest projects in the last eight years. Commercial thinning is used when the excess tress removed (thinned) have merchantable value. The result is typically neither aesthetically nor environmentally impactive. Since last year there has been a 1% reduction in the use of clearcut harvest methods. This trend is significant because clearcuts typically are visually impactive.

Clearcuts result in stands that lack variety of texture, form, color, or size. For the 8-year period from 1992 – 1999, only 4% of total harvested acres used clearcut methods.

Selection harvest methods were used on 12% of projects, down 2% from last year. High visual quality can result from use of this approach to harvest. Through the periodic removal of trees in 10-20 year intervals, individually or in small groups, natural appearances and high visual quality typically result.

In summary, Visual Quality Objectives for 1999 were within the threshold for planned sale activities as well as implemented sales on the Forest.

Forest Plan Monitoring Item D-1: Off-Road Vehicles -- Effects on Resources, Uses, And Public Safety

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 1987-1999.

Table 10. Total number of citations issued by year

Year	Number of Citations
1987	22
1988	13
1989	54
1990	182
1991	144
1992	167
1993	204
1994	185
1995	88
1996	133
1997	240
1998	246
1999	394

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 than endangers any person or property, or which damages or unreasonably disturbs the land, wildlife or vegetative resources; or the use 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 (and 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 FY99, 394 citations were issued. This is an increase of 148 citations over the 246 issued in FY98. The increase in citations was mainly in two categories: 1) damage to natural features or government property, and 2) using a type of vehicle prohibited by order. The reason for the large increase in the number of citations issued in FY99 is not known. The FY00 data will help show whether this increase in FY99 is a trend or an anomaly.

Forest Plan Monitoring Item E-1: Potential Impacts of Land Disturbing Projects on Known Cultural resources

The purpose of this monitoring item is to insure that projects do not cause adverse effects to cultural 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

a. *Timber Sales* – The Forest reported (and the state Historic Preservation Office Reviewed) thirteen 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.

Background research was also completed on the North Fork of the St. Joe River to determine the impact on proposed timber sales on heritage resources. Work on this project will continue in 2000.

b. *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. A request for help with the repair of the porch was made to the Regional Office. In May 2000 the Regional Preservation Team will assist the Forest in repairing the porch.

c. *Fire* – The Lakeface/Lamb Fuel Hazard Reduction Project will be monitored to insure there is no effect on heritage resources.

Another fire related undertaking involved the suppression of the Camp 7 Dam fire on Marble Creek. A fisherman apparently set part of the historic Camp 7 Splash Dam on fire and by the time it was discovered it had burned under the fill of the Marble Creek Road. The Forest dispatched a fire crew to put out the burning dam remnants. At the same time the Forest Archaeologist contacted the State Historic Preservation Office and the Forest Surveyor to determine what actions could be taken to minimize the lost of historic values represented by the structure. The Forest Archaeologist and Forest Surveyor subsequently mapped remnants of the dam. After directing water into the buried sections of the burning dam the fire crew was eventually able to bring the fire under control and put it out.

d. *Trails* – The Forest began construction of the "Route of the Hiawatha" Rail Trail in 1997. The 1999 work included continuing the repair of the concrete liner in the St. Paul Pass Tunnel, reconstruction of the Tunnel 25 snow shed and the repair of the Tunnel 21 snow shed. The repair of the concrete liner should be complete in the year 2000.

e. *Mining* – The Forest continues to close 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.

f. *Special Use Permits* – An existing outfitters camp was inventoried in 1999 and will be test excavated in 2000 to determine any potential impacts to heritage resources.

An additional proposed outfitters camp was examined and will also be test excavated in 2000 to determine if there will be any impacts to heritage resources.

g. *Recreation* – A proposed toilet installation at Priest Lake was found to potentially impact a prehistoric site. Initial test excavations identified the prehistoric site and further test excavations, mapping and other studies will be undertaken in early summer 2000 to determine a location for the toilet that will have no adverse effect on the identified heritage site.

h. Volunteer Projects

1. *Surveyors Peak* – During the summer of 1999, volunteers completed the repairs to the Surveyors Peak Fire Lookout. The repairs included replacement of the flooring, installation of a door shutter and lock bar, and construction of a propane gas bottle shed and staining the exterior of the building. Once the propane lines and fixtures are checked the lookout will be placed on the cabin rental program.

2. *Seeacquoteen Road* – Mark E. Weadick volunteered to locate the remnants of the Seneacquoteen Road. Mark continues to make progress on this project in 1999.

3. *Grand Forks* – As part of the Passport in Time program, the Forest conducted test excavations at the site of the railroad construction town of Grand Forks, Idaho in June of 1999 for a second season. The project established the location and some detailed history of this town (associated with the construction of the Chicago Milwaukee and St. Paul Railroad over the Bitterroot Mountains in 1907-1911). A report of the project will be completed in 2000.

4. *Red Ives Ranger Station* – Another Passport in Time project involved the restoration of the Red Ives Ranger Station Office. This project involved removing modern additions from the Red Ives Office and returning it to the appearance of the original office. This included removal of carpet, wall covering and modern cabinets. The project will continue in 2000.

Forest Plan Monitoring Item F-2 Grizzly Bear Recovery Objective

The purpose of this item is to monitor the population changes and habitat effectiveness of grizzly bears to determine if recovery objectives outlined in the Grizzly Bear Recovery Plan are being met.

Background

The grizzly bear was listed as threatened in 1975. The bear originally occupied a variety of habitats throughout western North America, but today is confined to less than 2 percent of its original range. It occurs in five or six population centers south of Canada. Portions of two of these, the Selkirk and Cabinet-Yaak Ecosystems, occur on the IPNF.

Three main criteria listed in the Grizzly Bear Recovery Plan evaluate the status of grizzly bear recovery: 1) the number of female grizzly bears with cubs; 2) the number of bear management units (BMUs) where grizzly bears are known to occur; and 3) the number of grizzly bear mortalities.

Populations of grizzly bears persist in those areas where large expanses of relatively secure habitat exist and where human-caused mortality is low. The U.S. portion of the Selkirk Ecosystem of northwestern Idaho, northeastern Washington and southeastern British Columbia includes 1,081 square miles of grizzly bear habitat. Of the 2,600 square miles of grizzly bear habitat in the Cabinet-Yaak Ecosystem of northwestern Montana and northeastern Idaho, 749 square miles are in Bear Management Units managed by the IPNF. Forty to fifty percent of Selkirk/Cabinet/Yaak grizzly bears use habitat in both the U.S. and Canada. Grizzly bears are considered habitat generalists and opportunistic feeders. They commonly choose low elevation riparian areas and wet meadows during the spring and generally are found at higher elevations the rest of the year.

Historic information confirms that grizzly bears were more plentiful in the past than they are today. From the arrival of the first white settlers through the late 1970's, human access has steadily increased into areas occupied by grizzly bears, precipitating an increase in the frequency of human/bear encounters. These encounters have resulted in the death of some grizzly bears. The limiting factor for recovery of grizzly bear populations is direct mortality from people shooting bears, especially during hunting season. Sanitation is also an important threat, since most garbage sites are still open to bears. The main goal for recovery in both ecosystems is reduction of human-caused mortality (SCY report, Selkirk, Cabinet and Yaak Grizzly Bear Ecosystems Status Report, Sept 1999). Ever-increasing human use of national forests and development on private lands will cause more future impacts to grizzly bears, especially on their spring ranges, higher elevation meadows, ridges, and open brush fields during the summer.

In 1988, the Selkirk Ecosystem grizzly bear population density in the U.S. was estimated at one bear per 16 square miles. The recovery plan gave no population or density estimate for the Cabinet-Yaak ecosystem (U.S. Fish and Wildlife Service, Grizzly bear

recovery plan, Missoula, Mt. 1993). Grizzly bear populations are hard to assess because dense forest vegetation make it difficult to see bears. Population estimates are based on surveys, bear sightings, and mortality data from the Idaho Department of Fish and Game and U.S. Fish and Wildlife Service. The Selkirk ecosystem population estimate is 45 to 50 grizzly bears; the Cabinet-Yaak estimate is 30 to 40 bears. The populations are at or below half of the carrying capacity of the habitat (SCY report, Selkirk, Cabinet and Yaak Grizzly Bear Ecosystems Status Report, Sept 1999), and increasing by about 2% to 2.5% per year (Wakkinen, Wayne, Idaho Dept. of Fish and Game Non-game Wildlife Research Biologist. personal comm. Nov. 1999).

Since 1983, thirty-six grizzly bears have been fitted with radio collars and monitored (18 in the Selkirk Ecosystem and 18 in the Cabinet-Yaak Ecosystem). Grizzly bear family groups have been seen in all BMUs on the IPNF except LeClerc; none have been sighted in the Lakeshore BMU in the last 5 years. Most known mortality since 1987 (26 grizzly bears) has been human-caused, associated with motorized access and either legal hunting in British Columbia or hunter mis-identification. Grizzly bear hunting in the Canadian portion of the Selkirk Mountains has been closed since 1985 (SCY report). Grizzly bear mortalities were documented between 1987 and 1993 in the Blue-Grass, Long-Smith, Sullivan-Hughes, LeClerc, Kalispel-Granite and State of Idaho BMUs. In the last 5 years, only the Blue-Grass and Kalispell-Granite BMUs have had known grizzly bear mortalities.

The Forest Service has contributed to several goals in the grizzly bear recovery plan (U.S. Fish and Wildlife Service, 1993, Grizzly Bear Recovery Plan, Missoula, Montana). We have helped fund the monitoring of radio-collared grizzly bears. We have also published brochures and posted signs to help educate the public about bears and prevent accidental shooting of grizzly bears by hunters. Our law enforcement personnel have cooperated with state and U.S. Fish and Wildlife Service law enforcement agencies in preventing, investigating and prosecuting illegal bear mortalities.

Monitoring Data

Monitoring radio collared grizzly bears in the Selkirk Mountains between 1989 and 1994 showed that grizzly bears prefer habitat with low road densities, and avoid areas with over 2 miles of total road per square mile of habitat.

Increased public awareness, law enforcement and motorized access management are the primary tools for reducing grizzly bear mortality caused by humans. The number of gates in grizzly bear habitat is 10 times the number that existed in 1987.

The goals of access management in recovery areas are to reduce the potential for humans to encounter grizzly bears and to provide secure habitat areas for females to raise their young (SCY report, Selkirk, Cabinet and Yaak Grizzly Bear Ecosystems Status Report). Most road systems regulated to protect grizzly bears are only closed seasonally. They are open to motorized access when bears are in their dens. Winter logging is used extensively in grizzly bear habitat, when denning bears will not be disturbed.

Fifty-seven road closures designed to provide security habitat have been routinely monitored on the Priest Lake Range District since 1995. Sixteen of these closures are guardrail barriers and the remainders are standard gates. Monitoring is conducted on the average of once each two weeks and a shorter time period when conditions permit. During state hunting seasons, closures are monitored once each week. Monitoring determines gate effectiveness and also provides routine maintenance such as replacement of signs and repair of any structural damage if needed. With regular monitoring and maintenance, gates and guardrail closures are very effective in providing security habitat for grizzly bear and other wildlife species. Guardrails are generally more effective than gates. Gates are more easily vandalized than guardrails as a result of their generally lighter construction. Guardrails present a more formidable closure structure than gates and thus are less likely to be breached by vandalism. Guardrail barriers are more acceptable by the public than gates.

Grizzly bear habitat security: Security is measured annually in fifteen grizzly bear management units in the Selkirk and Cabinet-Yaak Ecosystems. Each BMU (except Lakeshore) is approximately 100 square miles, the average home range of a female with cubs. The primary habitat management goal in 1987 was to maintain at least 70 square miles of secure habitat in each BMU, with essentially no restrictions on administrative use.

Table 11 on the following page presents the grizzly bear security trends for each bear management unit for the period of 1990 to 1999.

Table 11. Square Miles of Grizzly Bear Security

GRIZZLY BEAR MANAGEMENT UNIT AND ECOSYSTEM	Total Square miles	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Cabinet-Yaak Ecosystem											
North lightning	107	81	61	67	73	75	71	72	74	71	74
Scotchman	95	79	72	74	70	71	71	70	71	66	67
Grouse	99	46	46	68	72	72	68	68	68	56	60
Boulder	98	70	66	70	72	72	70	71	70	70	68
Keno**	96	70	70	70	70	70	70	70	69	73	57
Northwest Peaks**	109	74	74	81	79	79	79	79	86	72	92
Selkirk Ecosystem											
Blue-Grass	90	71	72	70	71	71	73	71	71	71	67
Long-Smith	104	82	79	83	73	73	84	84	84	72	82
Ball Creek	91	75	72	70	70	70	72	73	87	77	73
Myrtle	99	69	71	70	72	72	72	69	69	73	73
Sullivan-Hughes*	120	86	82	79	76	76	74	74	74	74	90
Le Clerc*	130	63	63	72	72	72	72	72	72	ND	82
Salmo-Priest	136	96	96	104	108	108	108	108	108	108	102
Kalispell-Granite	132					63	63	55	94	96	95
Lakeshore	30					ND	ND	ND	ND	8	8

ND = No Data
* Shared with Colville NF
** Shared with Kootenai NF

The Kalispell/Granite and Lakeshore bear units were established in 1993 as a result of the revised Grizzly Bear Recovery Plan.

The Colville NF, which shares two BMUs (Sullivan-Hughes and LeClerc) with the IPNF, does not have the 70 square miles security target in its Forest Plan.

1998 & 1999 data for North Lightning, Scotchman Peak, and Grouse based on GIS analysis. Previous analysis was based on hand digitizing.

Myrtle was below security in 1990, 1996 and 1997 because of private landowner's activities. There were no security losses due to Forest Service activities.

New Interim Guidelines From Interagency Grizzly Bear Committee: The Forest Plan allowed for the incorporation of the best available science for the management of grizzly bears by incorporating the Interagency Grizzly Bear Committee (IGBC) as direction. This allowed the Forest Plan to be a dynamic document and take advantage of new research.

Much of the current direction for recovery of this species comes from the IGBC. The Committee recently decided that the standard for measuring grizzly bear security in the Selkirk and Cabinet-Yaak Ecosystems would be the percent (not square miles) of secure habitat. At the request of the IGBC, the Selkirk/Cabinet-Yaak subcommittee (1998) developed an interim access management strategy to address impacts related to motorized access, until Forest Plans are revised. This strategy specifies desired levels of security and core habitat in each BMU. These will be in place until the subcommittee can formally adopt guidelines for approval by the Interagency Grizzly Bear Committee. Public meetings were held in Bonners Ferry, Priest Lake and Sandpoint to determine the level of public support for the interim guidelines. Comments received at these public meetings are being used in the current review of the habitat guidelines.

The interim guidelines established a new criterion for a minimum level of security habitat that is different from the Forest Plan direction. It requires 70 percent (vs.70 square miles) of each BMU be secure habitat. It also states there will be no net loss of existing core habitat. Compared to the forest plan 70 square mile standard, the 70 percent standard is easier to achieve in BMUs that are less than 100 square miles in size. However, the new standard requires a larger area of secure habitat in BMUs that are over 100 miles in size.

This change will make it somewhat more difficult to compare the present monitoring period's ongoing BMU security status with the next decade's status.

Each grizzly bear management unit has goals based on the guidelines established by the Forest Plan and the Interagency Grizzly Bear Committee. These are:

- Percent core (core areas are those areas free of motorized access during the security period),
- Square miles of security,
- Percent security
- Percent of the BMU with open road density greater than one mile per square mile (open roads are those without restrictions on motorized vehicle use), and
- Percent of area with total road density greater than two miles per square mile

Table 12 lists the goals for each of these and presents the 1999 data for each grizzly bear management unit. Four BMUs meet all the guidelines: Ball-Trout, Long-Smith, Myrtle, and Salmo-Priest. An asterisk indicates an improved condition since 1998.

Table 12. Grizzly Bear Management Units (BMUs) - 1999

	% 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 =	**>or =55%**	**> or = 70**	**> or =70%**	**< or = 33%**	**< or = 26%**
Selkirk Ecosystem					
Ball-Trout	74%	73 sq mi	80%	26%	10%
Blue-Grass	45%	67 sq mi	74%	30%	33%
Kalispell - Granite	46%	95 sq mi	72%	31%	29%
Lakeshore	17%	8 sq mi	28%	82%	56%
LeClerc*	33%	82 sq mi	68%	38%	48%
Long-Smith	71%	82 sq mi	78%	21%	12%
Myrtle	61%	73 sq mi	80%	28%	18%
Salmo-Priest	64%	102 sq mi	75%	30%	24%
Sullivan – Hughes*	55%	90 sq mi	75%	20%	23%

*These Bear Management Units are shared with the Colville NF, which does not have a 70 square mile security target in its Forest Plan.

	% 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.
Cabinet-Yaak Ecosystem					
North Lightning	61%	74 sq mi	69%	38%	20%
Scotchman	63%	67 sq mi	70%	35%	27%
Northwest Peaks**	60%	92 sq mi	71%	32%	22%
Keno**	56%	57 sq mi	71%	37%	26%
Boulder	48%	68 sq mi	69%	37%	35%
Grouse	41%	60 sq mi	61%	45%	42%

**These Bear Management Units are shared with the Kootenai NF.

Evaluation

Table 11 presented the 1999 data for each BMU. Table 12 below evaluates whether each BMU meets or does not meet each of the five goals

Table 12. Grizzly Bear Management Units (BMUs) - 1999

	% 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 =	**>or =55%**	**>or=70**	**>or=70%**	**< or = 33%**	**< or = 26%**
Selkirk Ecosystem					
Ball-Trout	Meets	Meets	Meets	Meets	Meets
Blue-Grass	Does not meet	Does not meet	Meets	Meets	Does not meet
Kalispell - Granite	Does not meets*	Meets	Meets*	Meets*	Does not meet*
Lakeshore	Does not meet	Does not meet	Does not meet	Does not meet	Does not meet
LeClerc	Does not meet	Meets	Does not meet	Does not meet	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 Ecosystem					
North Lightning	Meets	Meets	Does not meet	Does not meet	Meets
Scotchman	Meets	Does not meet*	Meets	Does not meet	Does not meet
Northwest Peaks	Meets	Meets*	Meets	Meets	Meets
Keno	Meets	Does not meet	Meets	Does not meet	Meets
Boulder	Does Not Meet	Does not meet	Does not meet	Does not meet	Does not meet
Grouse	Does Not Meet	Does not meet	Does not meet	Does not meet	Does not meet

Summary of Table Evaluation; Six of the fifteen BMUs meet all the guidelines: Ball-Trout, Long-Smith, Myrtle, Northwest Peaks, Sullivan Hughes, and Salmo-Priest. The others meet one to three of the goals with the exception of the Lakeshore unit which is discussed below. The monitoring data shows that some BMUs are very close to meeting some goals while others have a ways to go. An asterisk indicates an improved condition since 1998.

The Lakeshore BMU on the west shore of Priest Lake is only 30 square miles and has a high amount of summer homes, resorts, campgrounds, etc. which makes grizzly bear habitat maintenance and improvement unattainable in this area. Since it is not reasonable to achieve similar security and core objectives as the other BMUs because of land ownership patterns, the goals for Lakeshore BMU are to have no net loss of existing security and core habitat. Related goals are to reduce grizzly bear attractants, sanitation problems, and the risk of grizzly bear mortality.

Habitat Security Improvements: Security has increased in several important ways that cumulatively provide important benefits to recovering the grizzly bear:

- Less administrative use (Forest Service approved traffic on roads closed to the public);
- Reduced noise level of administrative uses behind gates (i.e. weed control or timber sale planning vs. heavy equipment use);
- More monitoring of road closures, resulting in quicker repairs and more effective road closures;
- Planning gate locations to allow management flexibility while protecting habitats which are known to be used by grizzly bears;
- Designing and building gates which work better to restrict motorized vehicles;
- Changing gate locks to prevent illegal access into closed areas;
- Helping the public to understand and support road closures for bears by standardizing the closure dates; and making travel plans and closure signs easier to read, and educating Forest Service personnel about the importance of road closures for bears;
- Funding gate monitoring and maintenance; and
- Better accountability of road status using GIS (Geographic Information Systems).

Recommended Actions: If we are to successfully recover grizzly bear populations, the Forest Service must continue to work with the Idaho Department of Fish and Game in dealing with direct mortality of the bear by humans, especially during hunting seasons. We should emphasize public information and education efforts, especially with hunters. A multi-action strategy is needed for the recovery to be successful. As funding allows, support Idaho Department of Fish and Game's monitoring of radio collared grizzly bears and research on road densities and bear habitat use.

Forest Plan Monitoring Item F-3 Caribou Recovery Objectives

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 Mountain Caribou Recovery Plan are being met (U.S. Fish and Wildlife Service, 1994, Recovery Plan – Selkirk Mountain Woodland Caribou).

Background

The Selkirk caribou population was emergency listed as endangered in 1983, and a final ruling on its status appeared in the Federal Register in 1984. 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 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 to the northern portion of the IPNF.

The caribou population is threatened by illegal killing, predation, habitat alteration from timber harvest and fires, road kill, and possibly displacement by snowmobiles (USFWS Recovery Plan, 1994). It has been speculated that past timber harvesting in and adjacent to caribou habitat have increased habitat fragmentation beyond historic levels and have 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 1999 winter caribou survey conducted by Idaho Dept. of Fish and Game counted 48 caribou in the Selkirk Ecosystem. Five of these were located in Idaho, one in Washington and forty-two in British Columbia. The official population estimate for this herd for 1999 is 49 caribou. There were no changes in caribou habitat on the Idaho Panhandle National forest in 1999.

Evaluation

Caribou numbers vary annually, and have been monitored with annual winter censuses and radio-collared animals by Idaho Dept. of Fish and Game, Washington Dept. of Fish and Wildlife, and the U.S. Fish and Wildlife Service. From 1987 to 1990, sixty caribou

were transplanted to the IPNF from British Columbia. The current population of the Selkirk caribou herd is 48. The population trend is down, although the last two years mortalities have been fewer than in previous years. Before 1996, Idaho Dept. of Fish and Game monitored the caribou on the IPNF using U.S. Fish and Wildlife Service and Forest Service funding. In 1996 and 1997 Washington Dept. of Fish and Wildlife transplanted caribou from British Columbia to northeastern Washington. Since then, Washington has taken the lead in monitoring caribou survival, mortality and habitat use.

Monitoring has shown that the overall survival of the relocated caribou has been lower than expected, with high caribou mortality. The known causes of mortality have been predation, poaching, highway kills and accidental deaths. Mountain lions, grizzly and black bears all prey on this caribou herd. In many cases, the species of predator that killed a caribou could not be determined because of extensive scavenging by bears. Forty-two caribou deaths were documented in the Selkirk population between 1987 and 1998. The radios on eighteen other caribou failed or were lost; it is not known whether these animals have died.

The Washington Department of Fish and Wildlife released 19 caribou in the spring of 1996 and 13 in the spring of 1997. Therefore the 1997 winter census includes the 19 caribou that were released in 1996 but not the 1997 release. The apparently stable population in 1997 was only possible by transplanting 19 caribou from Canada. This indicates a serious decline in the population that existed prior to the augmentation.

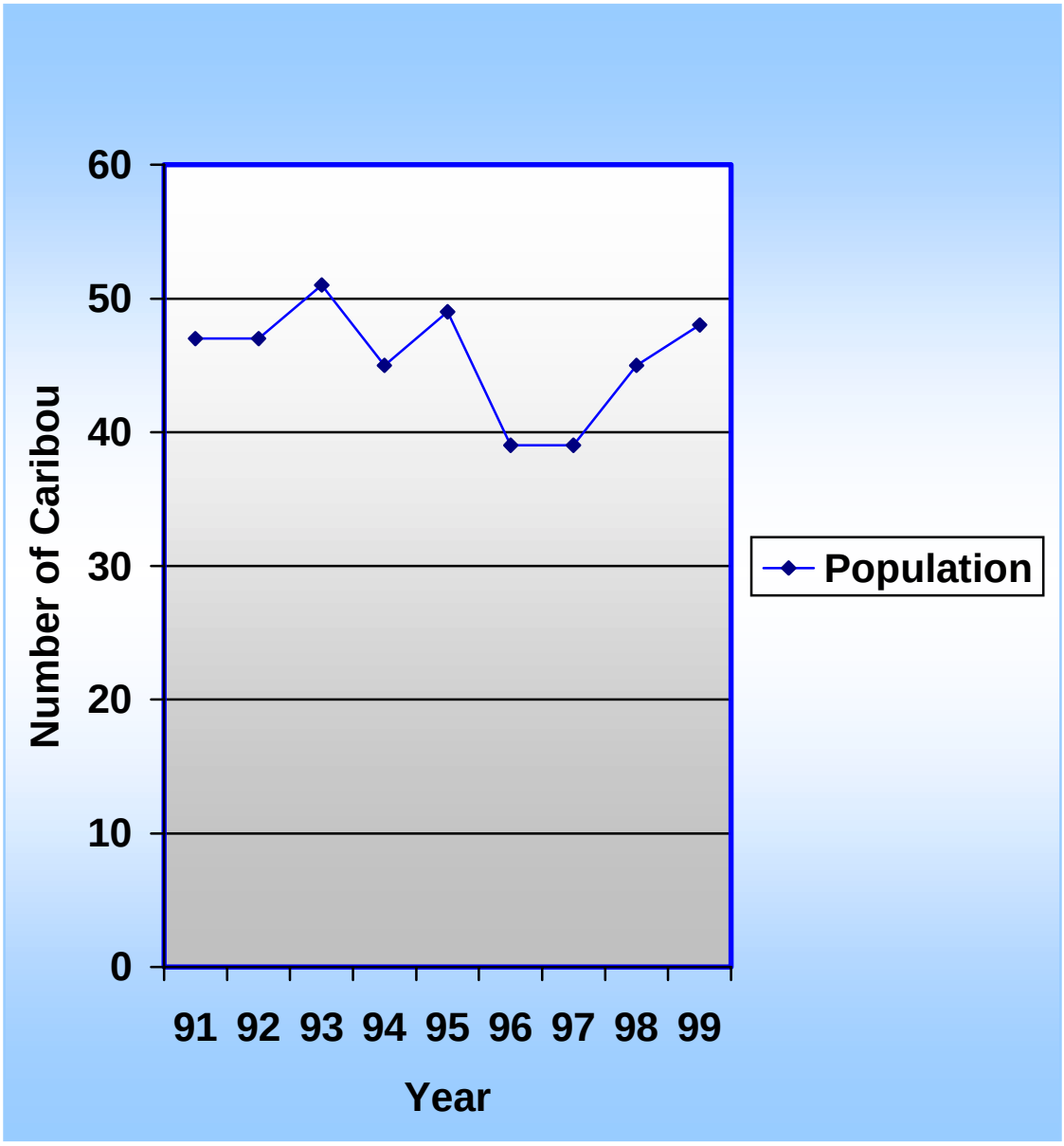
As part of the plan for recovery, caribou were transplanted into the ecosystem from source populations in British Columbia. Transplanting caribou from Canada into the population to compensate for the high mortality made it possible to stabilize the population at about 50 animals for several years before it declined again. Sixty caribou were translocated from central British Columbia to the Selkirk Mountains of northern Idaho between 1987 and 1990. By 1990, the Selkirk caribou population had increased to approximately 55 to 70 animals. The population remained somewhat stable through the early 1990's but a decline in 1996 was believed to be the result of increased predation and other factors. The Washington Department of Fish and Wildlife released 19 caribou in the spring of 1996 and 13 in the spring of 1997. These individuals have been found in Washington, Idaho and British Columbia since their release.

In 1983 there were about 30 caribou in the Selkirk Ecosystem when the species was placed on the endangered species list.

From 1987-1990 60 caribou were transplanted to Idaho from British Columbia. From 1996-1998 43 caribou were transplanted to Washington from British Columbia.

Figure 4

Selkirk Woodland Caribou Population



Selkirk Mountains Woodland Caribou Recovery Project: The interagency caribou technical committee has identified predation by mountain lions as a major factor limiting the recovery of this species. This project is a cooperative effort among state, federal, and provincial (British Columbia) agencies and private researchers. It is designed to monitor and identify individual mountain lions that are preying on caribou, and remove the problem animals.

Habitat Monitoring: The Idaho Panhandle National Forest encompasses 174,760 acres of woodland caribou habitat. This is 39% of caribou habitat in the Selkirk Ecosystem and 53% of the caribou habitat in the U.S. portion of the ecosystem. (USFWS 1994) In 1998 23,300 acres of caribou habitat were monitored. 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, continue to implement recommendations of the caribou steering committee and recovery teams. Support Idaho Dept. of Fish and Game in winter caribou censuses; 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

The purpose of this monitoring item is to evaluate the impacts of forest management activities on watersheds. There are three general areas included under item G-2: monitoring of Best Management Practices (BMPs), baseline monitoring, and validation of watershed models. This year's report discusses: 1) the analysis of long-term water quality data for calibrating and validating watershed response models, and 2) BMP monitoring.

1) Analysis of Long-Term Water Quality Data

Background

The Forest has maintained eight long-term water quality-monitoring stations that can serve as the basis for calibrating and validating watershed response models. This report summarizes the findings from three of those eight stations. The Forest intends to complete similar analyses of data over the next two or three years of the remaining five long-term stations.

Monitoring Data

The initial effort to analyze data from three long-term water quality-monitoring sites and to compare those assessments to the WATSED calculations has produced some interesting results. They also suggest some inconsistencies and needs for follow-up, as well as adjustments to the Forest's monitoring plans.

This report summarizes the findings at three long-term sites on the Forest.

Methods

Total measured sediment load is derived from the sum of the daily-suspended load and bedload sediments in each year analyzed. These sediment components were calculated from linear regression models that reflect the correlation of the suspended and bedload sediment measured in the same year related to the associated discharge when each was measured.

Halsey Creek

The Halsey Creek monitoring station is located near the mouth of the stream. Halsey Creek is a small, 4.9 square mile watershed that is tributary to Teepee Creek in the North Fork of the Coeur d'Alene River Basin. It has been on the monitoring system since (water year[1]) 1979 and has been gauged with a water-level recorder continuously since 1984. Instantaneous suspended sediment loads have been collected intermittently since 1979; and seasonally suspended sediment has been collected on a daily-integrated basis from

[1] Water information is collected, recorded, and generally analyzed on a *water year* basis. The water year (WY) begins October 1st and continues through September 30th. In the inland northwest, the water year is well adapted to the wet fall and winter with the accumulation of snow, the spring snowmelt-runoff period, and the relatively dry summer vegetative growth season.

1983 through 1995. Sporadic bedload measurements were made from 1988 to 1990, 1999, and 2000.

Halsey Creek is a relatively undeveloped watershed in the North Fork of the Coeur d'Alene River drainage. There were some early road developments in the 1970s, with a small amount of logging. Some light logging (salvage?) took place in the headwaters during the 1980s; and more intensive logging occurred in the early 1990s. Fire history includes relatively small portions of the watershed burned in 1910, 1918, and 1920.

Modeled estimates suggest that "natural" sediment from Halsey Creek is expected to be about 120 t/yr. Measured sediment was apparently and consistently a third of this (36 tons per year…30 percent.) On top of this, WATSED assessed a considerable amount of additional sediment to the developments that took place in the watershed. Measured data started reflecting this response in 1990, but the measured data continued to be substantially less than model estimates.

These sediment discrepancies are not yet explained. We believe that the new tools that are currently under development, and that were used in this WATSED assessment, are not appropriately identifying important features, such as slope position. Never the less, the extraordinary low measured sediment in this drainage raises a question.

The peak flow and flow duration versus duration estimates by WATSED, both in terms of magnitude and change over time, appear to be reasonably correlated over the period. Modeled estimates of peak monthly flows were 83 percent of the measured flows; and estimated flow duration was 87 percent over the same period.

It is apparent that there are many unanswered questions between Halsey Creek measurements and modeled estimates.

Big Elk Creek

The Big Elk Creek monitoring station is located near the mouth of the stream. It is a larger, 11.6 mile^2, more developed watershed that is also tributary to Teepee Creek in the North Fork of the Coeur d'Alene River Basin. Initial monitoring began in 1976. It has been gauged with a water-level recorder continuously since 1988. Instantaneous suspended sediment loads have been collected intermittently since 1976; and seasonally suspended sediment has been collected on a daily-integrated basis from 1988 through 1996. Sporadic bedload measurements were made from 1988 to 1990, once in 1994, and again in 1999 and 2000.

Big Elk Creek is a developed watershed near Halsey Creek in the North Fork of the Coeur d'Alene River drainage. Logging began around 1939, and was extensive for the next decade. Logging was again initiated in the 1950s. No large-scale fires have been recorded in the drainage since 1870.

Modeled estimates suggest that "natural" sediment from Big Elk Creek is expected to be about 241 t/yr. Measured sediment after a long recovery period is about 94 percent of the WATSED undisturbed estimate. Again, WATSED assessed a considerable amount of additional sediment to the developments that took place in the watershed long ago. Measured data reflected this response, but recover appears to have been substantial, and

the measured data continued to be substantially less than model estimates. This suggests that the erosion-sediment recovery "tails" for Belt-series based watersheds are far too great, leading to exaggerated WATSED estimates of sediment during and following recovery phases.

WATSED appears to be estimating 3.5 percent less peak flow increases than was measured. (Unfortunately, the undisturbed peak flows were never measured due to the early development of this watershed; so the discrepancy may be the result of WATSED underestimating natural peaks.) WATSED estimates and measured duration data are within 5 percent of each other, indicating a very good estimate.

Long Canyon Creek

The monitoring station on Long Canyon Creek is located near the mouth. It is a larger, 29.8 mile^2, watershed that is a principle tributary to the Kootenai River near the Canadian border with the US. It has been on the monitoring system since 1974 and has been gauged with a water-level recorder continuously since 1985. Instantaneous suspended sediment loads have been collected intermittently since 1974; and seasonally suspended sediment has been collected on a daily-integrated basis from 1980 through 1994. (Note however, that discharge was estimated from relationships with nearby Boundary Creek from 1980 through 1984.) Frequent bedload measurements were made from 1984 to 1991; and less frequently in 1999, and 2000.

Long Canyon is a large (30 square miles) and essentially undeveloped drainage in the Kootenai River Basin. Fire history includes relatively small portions of the watershed burned in 1910, 1918, and 1920.

Modeled estimates suggest that "natural" sediment from Long Canyon Creek is expected to be about 563 t/yr. Measured sediment has averaged 446 t/yr for 10 years. (Modeled estimates were 126 percent of measured sediment over the same period.)

WATSED estimates of peak monthly flows were 83 percent of the measured flows; and estimated flow duration was 103 percent.

Evaluation

The findings from the three sets of comparisons indicate that the WATSED measured responses in terms of the three watersheds are within a reasonable range. They also suggest that natural sediment loads, both measured and predicted are close, with the outstanding exception of Halsey Creek. In two cases, the recovery relationships for predicted suspended loads appear to be higher than expected or measured. The findings from these three sites has generated additional information needs and action items for the next year:

- Continue the assessment of three more long-term gaged sites (Smith Creek, a Kootenai River tributary; and Bird Creek and Eagle Creek on the St. Joe River.)
- Check the inventory/ArcView interface application (WADA) that captures inventory data and converts it to WATSED input format. This is an experimental application that is currently under development. It has not been completed or

thoroughly tested to date. It was used for the watersheds in the Coeur d'Alene River analyses.

- Re-evaluate the Belt geology-related erosion variable and coefficients used in the IPNF version of WATSED.
- Re-evaluate the Belt geology-related erosion recovery curves for both mass erosion and for surface erosion used in the IPNF version of WATSED.
- Revise the instream monitoring plans used to acquire and process water quality data on the Forest to improve the sample design for bedload at the Coeur d'Alene River Basin sites.

2) Monitoring of Best Management Practices

Background

Monitoring of Best Management Practices asks the following questions:

·Are BMPs's being applied? (implementation monitoring)

·Are BMPs being implemented as designed and at the right time? (implementation monitoring)

·Are BMPs effective in controlling nonpoint sources of pollution? (effectiveness monitoring)

·Are BMPs protecting water quality and beneficial uses? (validation monitoring)

Monitoring Data and Evaluation: The results from the 1999 Best Management Practices monitoring and evaluation are shown in Table 13. The summaries shown in bold print contain updated information on projects described in previous monitoring reports.

Table 13. Best Management Practices Monitoring

Project Location	Summary of Activities	Summary of Findings
Big Elk Creek Road System, Coeur d'Alene River Ranger District	**Implementation:** 52 stream crossings rehabilitated resulting in removal of 15,475 cubic yards of material. .6 miles of road were recontoured and 1.3 miles of road were scarified. 112 pieces of wood and 18 loads of rock were used in channel restoration.	Project was verified to be implemented as designed.
Deer Creek Mine Site, Coeur d'Alene River Ranger District	**Implementation:** 5 channel sites, 2 mine portals, and 1 large mine dump rehabilitated. 5 miles of road were recontoured. Wood was placed in 2 channel sites and seeps during restoration.	Project was verified to be implemented as designed.
Prado Creek Road System, Coeur d'Alene River Ranger District	**Implementation:** 19 channel sites were rehabilitated. 2600 cubic yards of fill were removed. .3 miles of road were recontoured. 13 water bars were installed on roads to help divert water. 14 pieces of wood placed in channel during restoration.	Project was verified to be implemented as designed.
Drexel Creek Road System, Coeur d'Alene River Ranger District	**Implementation:** 13 channel crossings were rehabilitated. 10 rolling dips, along with 50 water bars were installed to divert water during runoff. 2 miles of drainage ditch improvements 200 ft. of obliteration done and 3 acres seeded.	Project was verified to be implemented as designed.
East Fork Eagle Creek, Coeur d'Alene River Ranger District	**Implementation:** 8 channel crossings were rehabilitated. 4 miles of road closed by project, 1.5 being recontoured.	Project was verified to be implemented as designed.
Tourist Creek Rehab Project, Coeur d'Alene River Ranger District	**Implementation:** 30 channel crossings were restored, 1 ditch relief culvert removed. 1.7 miles of road re-contoured, .2 miles of road obliterated.	Project was verified to be implemented as designed.
Murray Scenic Night Rehab Project, Coeur d'Alene River Ranger District	**Implementation:** 10 channel crossings were restored. 3.4 miles of road was partially recontoured and less than .5 miles was obliterated. 6 acres was seeded.	Project was verified to be implemented as designed.
Beaver Creek Road Rehab Project, Coeur d'Alene River Ranger District	**Implementation:** 18 channel crossings were restored, 20 additional crossings had pipes upgraded to meet 100-year flood specs. 54 new erosion control dips were reconstructed, and 10 miles of road was fully recontoured.	Project was verified to be implemented as designed.

Project Location	Summary of Activities	Summary of Findings
Emerald Creek Garnet Mine Rehab Site, St. Joe Ranger District	**Implementation:** Garnet Mining Company completed reclamation work that involved 12 acres of seeding with grass, sedges and shrubs. Drainage ways were defined. Slash was placed in head cut areas of previous tailings.	Vegetative cover was successful, 90-95% cover. Riparian vegetation coming along well. Recommendations: allow at least 2 more growing seasons before allowing cattle to return to site, and monitor after the second season to ensure that project is functioning adequately.
Emerald Creek Cattle Exclosure, St. Joe Ranger District	**Effectiveness:** Cattle exclosure was constructed some years ago to minimize cattle encroachment in stream.	Fence was non-functional in many areas, wire was missing and gates were open. Evidence of cattle use within exclosure. Recommended to redesign and rebuild the exclosure fence.
Cats Spur Creek Cattle Exclosure, St. Joe Ranger District	**Implementation:** Fence was redesigned and constructed since old fence was damaged. A gate was installed at one end of exclosure to allow cattle removal if they gained access. Cedar stays were used between posts to strengthen and prolong fence life.	Recommendations: to monitor shrub component of riparian area. Plant rootstalk of willows, alders and other riparian shrubs. Periodically inspect fence condition. Report to permittee any problems and follow up with maintenance.
Slate Creek, St. Joe Ranger District	**Implementation:** Culverts were installed in tributaries.	Zone hydrologist monitored installation of culverts and provided advice on maintaining hydrologic integrity of crossings.
Inspection of newly constructed roads throughout the St. Joe Ranger District.	**Implementation:** Roads were inspected for design standards and erosion control measures. Slash filter windrows were present at toe of fill slopes on all sections. Fill slopes at drainage crossings have rock blankets installed to prevent surface erosion. Hydro mulching and seeding were applied on cut and fill slopes.	Monitoring showed that project met design criteria standards.
Rehab of the Garnet Dig Sites in Emerald Creek, St. Joe Ranger District.	**Implementation and effectiveness: follow -up monitoring of work done in 1999: Area was inspected in the fall of 1999 after digging season and rehab was completed.**	**Seeding and mulching adequate, channel alignment complete and functioning properly. Recommendations: Monitor during the 2000-growing season and apply additional seed if necessary.**
Horses Aspen Timber Sale, Charlie Creek, St. Joe Ranger District	**Effectiveness:** Logging units were inspected for Best Management Practices (BMPs) that included stream buffer distance, skid trail condition and re-vegetation, water bar installation and erosion.	Some compaction noted on skid trails but within forest plan standard of less than 20% compaction. Project area met BMP compliance.
Moss Creek Slide Rehab and Stabilization, St. Joe Ranger District	**Effectiveness, follow-up monitoring of work done in 1998: Hydrologist inspected planting and straw mulching work done in June of 1998 and also in 1999.**	**Survey showed over 80% survival. Logs were placed into gully in 1998 to increase channel roughness. A 9/98 review showed that most of logs were efficiently trapping sediment.**

Project Location	Summary of Activities	Summary of Findings
Blue Grouse Timber Sale, Units 11-15, St. Joe Ranger District	**Effectiveness:** Applicable rule items were: soil protection, landing location, drainage systems, waste material treatment, stream protection, and slash disposal in stream protection zones.	All ratings indicated good effectiveness for the BMPs reviewed.
Road rehab and review of stabilization and plant establishment: Trickle, Monkshood, Skookum, Tourist Creeks and Bennet Point	**Rehab projects from 1997 and 1998 were reviewed. Stream crossings were also reviewed.**	**Grass seed establishment was excellent on all projects. Stream crossings where culverts were removed showed good stability with no evidence of active head cutting or down cutting.**
Nordman/ Lodgepole Timber Sale, Priest Lake Ranger District	**Effectiveness:** Several wetlands are located within the sale area boundary. Sale was harvested in the winter months.	Site review showed that logging activity during the winter disturbed wetlands. District hydrologist suggests clearly map wetlands and mark with flagging high enough to be seen during winter logging operations.
PREF Headquarters Timber Sale, Priest Lake Ranger District	**Effectiveness:** Determine if BMPs were effective in protecting aquatic and soil resources and identify solutions where problems exist within BMP implementation.	Overall, BMPs on this sale were met. Some concerns where slash piles were burned only 50 feet from a live draw. Purchaser also placed toxic trash such as old oil and fuel cans in slash pile.
Buck Ranch Timber Sale, Priest Lake Ranger District	**Implementation and effectiveness:** Determine if BMPs were effective in protecting aquatic and soil resources and identify solutions where problems exist within BMP implementation	Review of sale revealed that purchaser did not construct skid trails in accordance to specifications by sale administrator. Purchaser did adequate seeding and fertilizing in disturbed soils and no streams were affected by skid trail locations.
Snow Latola Timber Sale, Priest Lake Ranger District	**Effectiveness:** Determine if BMPs were effective in protecting aquatic and soil resources and identify solutions where problems exist within BMP implementation.	Stream buffers were adequate but concerns with skid trail construction and location. Trails were eroding. Skid trails were treated with water bars, mulch, and seed to prevent further erosion.
Stonebead Timber Sale, Priest Lake Ranger District	**Implementation:** At time of field review, very little of sale had actually been harvested.	Units were located on stable landforms and water ways were protected. Perennial stream crossed road that needed a culvert to stabilize the site.
Flat Moores, Ojibway, Binarch, Quartz Jasper, Tola and Pelke Galena Sales, Priest Lake Ranger District	**Implementation:** As part of the Douglas-fir Bark Beetle Project, specialists worked with layout foresters to ensure that INFISH buffers were marked and temporary roads were stabilized.	Field review by the lead forester moving the cutting boundary to better protect stream zones resolved sites that had questionable proper buffer widths.
Rogers Mosquito Timber Sale, Priest Lake Ranger District	**Implementation:** Field review was conducted at a time when few of the acres were harvested.	INFISH buffers were followed and roads in the area were stable and well maintained.
Media Creek Road Failure, Priest Lake Ranger District	**Effectiveness, follow-up monitoring of project in 1998. In 1998, culvert was replaced with a larger culvert and realigned with approach from upstream.**	**Monitoring in 1999 showed that newly installed culvert is functioning properly.**

Project Location	Summary of Activities	Summary of Findings
Willow Creek Road, Priest Lake Ranger District	**Effectiveness, follow-up monitoring of project that was started in 1995: Roads were closed with gates as part of the Kalispell/Granite Bear Management Plan in 1995. They have not been maintained because of other district priorities.**	**Road failed in two locations in the spring of 1999. First failure was from a plugged culvert resulting in severe erosion to road prism. The second failure resulted in a mass failure. Road prism was destroyed and some sediment reached the stream of N.F. Granite Creek. No repairs have been made to these failures.**
Pass Creek Pass Road, Priest Lake Ranger District	**Effectiveness**: Review of Road 1124 in spring of 1999 revealed a large mass failure that originated from an old, abandoned temporary road.	Slide crossed Road 1124 and into the main stem of N.F. Granite Creek. District removed a portion of the failure that covered the road but no other rehabilitation or stabilization work was done.
Priest Lake Ranger District	**Effectiveness:** Field review of sites where water bars were not constructed correctly.	Water bars were not angled properly and there were no clear outlets for water bars. District hydrologist will continue to work with the road maintenance crews to improve the construction of future water bars.
Road Closures, Kalispell/Granite Access Plan, Priest Lake Ranger District	**Effectiveness, follow-up monitoring of work started in 1995: District has been decommissioning roads in this unit since 1995. Field review showed that majority of road prisms were not scarified, but all crossings were completely removed and were very stable and well vegetated.**	**Overall, with the exception of the Willow Creek Road, the road decommissioning work was very successful in stabilizing sites and preventing future road failures.**
Murray Creek Timber Sale KV Plan, Priest Lake Ranger District	**Effectiveness:** Most of the roads in sale were not obliterated, but were water barred, seeded and fertilized.	According to the field review, not all of the water bars are still effective but there are no damages to water resources.
Ojibway Timber Sale KV Plan, Priest Lake Ranger District	**Effectiveness, follow-up monitoring of project accomplished in 1998: 658 chains of roads were water barred, seeded and fertilized in the fall of 1998**	**While work was effective at controlling road runoff and stabilizing soils, work would have been more effective immediately after logging.**
Distillery Bay Timber Sale KV Plan, Priest Lake Ranger District	**Effectiveness, follow-up monitoring of project started in 1993: Two main roads in sale were seeded, fertilized and water barred under KV plan. Original work was done in 1993. In 1999, the crews conducted their final road monitoring.**	**Because of the successful seeding, there was very little erosion off the road. The roadbeds were estimated at having 65% to 90% grass cover and the pipes were stable.**
Kalispell Basin Timber Sale KV Plan, Priest Lake Ranger District	**Effectiveness:** Field review included roads that were obliterated and had earthen barriers installed, and roads that were closed using guard rails.	Sites where roads were closed with earthen barriers and pipes were pulled, rehabilitation efforts were successful. In same project area where roads were closed with guardrails and the pipes were left in place, there are problems with erosion.

Project Location	Summary of Activities	Summary of Findings
Lower Quartz Timber Sale KV Plan, Priest Lake Ranger District	**Effectiveness, follow-up monitoring of project started in 1997: Survey addressed only one road that had been obliterated in 1997. Road was located in lacustrine soils which are prone to erosion.**	**Grass seeding was successful on over 80% of the disturbed road surface and the culvert crossings were stable.**
Last Binarch Timber Sale KV Plan, Priest Lake Ranger District	**Effectiveness:** Earthen barriers were constructed to prevent motorized access onto previously closed roads.	Review showed that barriers were effective and non-drivable water bars were all functioning and there were no erosion problems.
Hatchery Trail Timber Sale KV Plan, Priest Lake Ranger District	**Effectiveness, follow-up monitoring of project started in 1997: Road was decommissioned in summer of 1997 and reviewed in 1999. Objective was to stabilize road and reduce the risk of road related failures while maintaining bicycle access for recreationists.**	**Most of the crossings were reported to be excellent in terms of stability. In a few cases, there were minor examples of erosion. Grassing of slopes had excellent results.**
Binarch Squaw Timber Sale KV Plan, Priest Lake Ranger District	**Effectiveness, follow-up monitoring of project started in 1993: Road was used to access a helicopter landing for another sale in 1999.**	**Water bars were broken down and old road prism was re-compacted. Sale contract did not address this specific road so sale administrator could not force purchaser to treat the road. Contracts for new sales need to address leaving roads that were originally ripped and water barred in the same condition.**
Pelke Divide Timber Sale KV Plan, Priest Lake Ranger District	**Effectiveness, follow-up monitoring of road that was closed a number of years ago: Road was closed with two culverts left in place. At time of closure road was scarified, water barred, seeded and barricaded with an earthen barrier.**	**Scarification and re-vegetation efforts were very successful. The concern is for the two remaining culverts and lack of maintenance of ditch lines and water bars. Road is physically closed but decision needs to be made to either maintain or remove culverts.**
Cache Creek Road Closure and Improvements by 10% Funding, Priest Lake Ranger District	**Effectiveness, follow-up monitoring of project started in 1998: In 1998, two roads were closed. Roads were reviewed in 1999 and evaluated for controlling sediment delivery and stabilizing the old road prism.**	**Review showed majority of crossings were healing but some crossings should have been wider to accommodate runoff. Excavated channel eroded because it lacked armoring.**
Priest Lake Ranger District Willow Planting Projects	**Effectiveness:** Willow planting projects were reviewed in the Woodrat, Murray, and Granite Watson timber sales. Objective is to determine if and where willows can be used successfully for site stabilization.	In all locations, it appears that willows only thrived in locations that maintained moist soil conditions throughout the year. If soil moisture drops, willow shoots dry out and fail to thrive.
Big Grouse Timber Sale, Sandpoint Ranger District	**Effectiveness:** Monitor scarification, seeding and water barring of 6.6 miles of closed road in sale area.	Road is heavily water barred and effectively ties into ditch line. Fill slope failure at one site. All culverts are functioning well. Some evidence of cut slopes slumping above several relief culverts, which increases potential for culverts plugging. Grass cover ranged from 30% to 75%.

Project Location	Summary of Activities	Summary of Findings
Stream Restoration Monitoring on Grouse and Trestle Creeks, Sandpoint Ranger District	**Effectiveness, follow-up monitoring of restoration work done in 1995: Photos are taken at permanent photo points to monitor restoration work that included stream bank stabilization in Trestle Creek and increasing sinuosity in Grouse Creek.**	**Existing gradient control and sediment control structures are working effectively. Additional structures will be added in Grouse Creek to prevent further mid-channel bar migration.**
Orser and Kriest Creek Timber Sales, Bonners Ferry Ranger District	**Effectiveness, follow-up monitoring of sales logged in 1989 and 1994. Sale administrator inspected units 8, 22, and 23. Units 8 and 2 were tractor logged over snow in 1994, and unit 23 was tractor logged over snow in 1989.**	**Rill erosion noted on several skid trails. Slope steepness on upper end of suitable skidding with tractor in area where soil is easily saturated. Hydrologist recommended that logging on landforms where saturated overland flow is likely be flagged during forest plan revision.**
Katka Peak Timber Sale, Bonners Ferry Ranger District	**Effectiveness:** Existing landing was used near unit from a previous sale after slash was burned on landing. Landing was 150 feet away from non-fish bearing stream.	Slash that supported landing failed and traveled to within 40 feet of stream. Landing now within INFISH buffer of stream. Landing will have to be rehabilitated to assure it does not affect water quality.
Kriest Creek Restoration Project, Bonners Ferry Ranger District	**Effectiveness/Trend, follow-up monitoring of restoration work done in 1996: Description of restoration work done for project is explained in the 1996 Forest Plan Monitoring Report.**	**Road triggered 2 fill failures that contributed sediment down reconstructed channel. Log and rock structures still in place but weakened by 1999 snowmelt. Road was obliterated, which will greatly reduce risk of future slope failures. No additional stream work proposed. Cross-section surveys and Wolman pebble counts done in 1999. District will continue to monitor.**
Gable Creek Restoration Project, Bonners Ferry Ranger District	**Effectiveness, follow-up monitoring of restoration work done in 1995: Description of restoration work done for project is explained in the 1995 Forest Plan Monitoring Report.**	**Structures are still functioning as designed. Regeneration is highly successful. Project has withstood at least 3 major flood events.**
Boulder Meadows Road Obliteration Project, Bonners Ferry Ranger District	**Effectiveness, follow-up monitoring of work done in 1998: Description of work for project is explained in 1998 Forest Plan Monitoring Report.**	**Review showed objectives of eliminating mass failure risk at stream crossings were fully met. Regeneration is highly successful.**
Keno Creek Road Obliteration Project, Bonners Ferry Ranger District	**Effectiveness, follow-up monitoring of work done in 1998: In 1998, over 70,000 cubic feet of road fill removed from channels and floodplains, 1,000 feet of unstable road fill was restored to a more stable natural contour.**	**Stream gradient and flood-prone width not fully reestablished on 4 of 8 crossings. Down cutting noted and channel widening activating slopes to produce sediment. Rock armor was added to channel banks. 2 plugged relief culverts were not removed as prescribed. Additional water bars constructed to stabilize poor cross-drainage.**

Project Location	Summary of Activities	Summary of Findings
Evaluation of Road Closures and Gates, Bonners Ferry Ranger District	**Effectiveness:** Assess historic and current access management in relation to watershed management. Field review by district hydrologist.	System roads with gates are lacking in maintenance due to budget constraints. Culverts and drainage ditches in these systems a major concern for water resource. District hydrologist working with other district people to find solution for this problem.
Boulder Creek, Bonners Ferry Ranger District	**Baseline:** Re-measurement of 1975 cross-sections in Black and McGinty Creeks to assess changes in stream morphology in Boulder Creek watershed.	Most major streams in Boulder Creek surveyed in 1975. So far, only Black and McGinty have been remeasured. Cross-sections have not yet been analyzed.

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 will commence during the field season of 2000, to validate predicted habitat and search for populations. Biological Assessments currently are addressing Silene as a proposed species following requirements in the Endangered Species Act and Forest Service Policy.

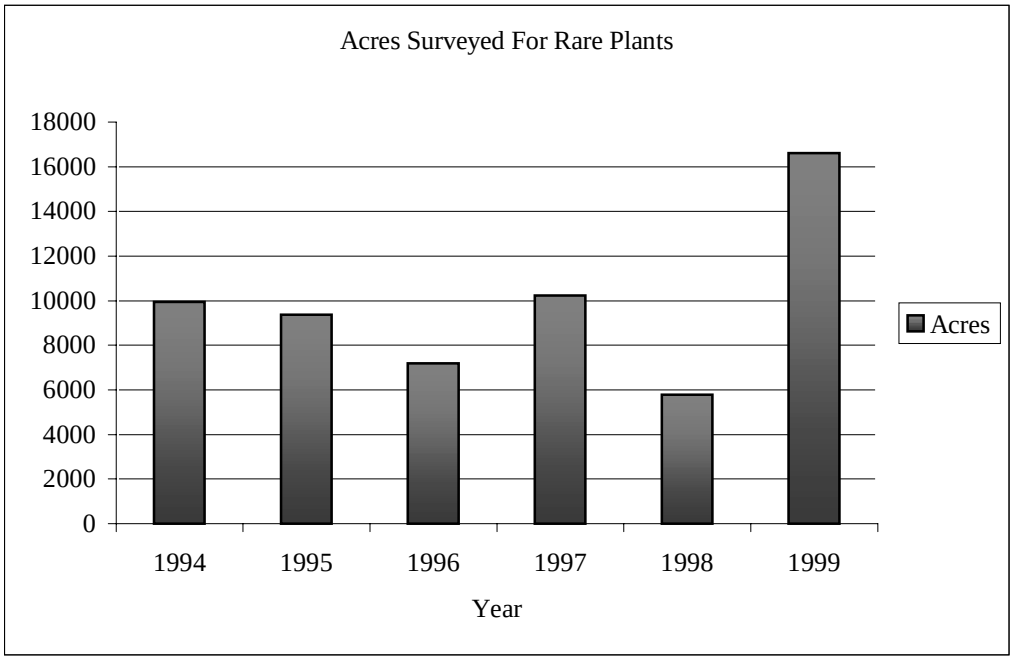
Sensitive Species: In March of 1999 the regional sensitive species list was updated, following the Region 1 Species-at-Risk Protocol. The new list contains 64 species listed as 'Sensitive' by the USFS. The Idaho Conservation Data Center 'tracks' a larger list of rare vascular and non-vascular plants 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://state.id.us/fishgame/cdchome.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 1999, forest botany personnel performed on-the-ground clearance surveys on 16,602 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 on the IPNF from 1994 – 1999.

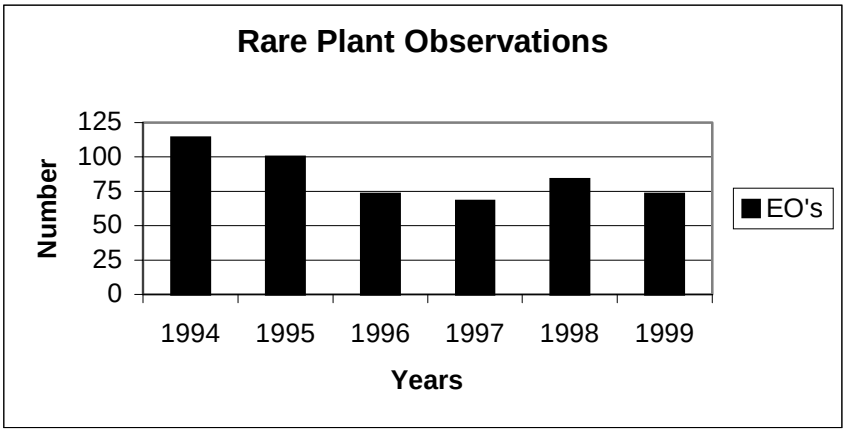


Good records of the number of acres surveyed by botany personnel have been kept since 1994. From 1988 until 1993 the exact number of acres surveyed was not well documented, but is estimated to be about 5000 acres. Prior to 1988, the Forest Service did not conduct surveys and rare plant observations reported to the ICDC were incidental. From 1994 to 1999, surveys occurred on 59,150 acres of federal lands with the express purpose of documenting and protecting rare plant populations from management activities and mitigating potential adverse effects. In 1999, 16,602 acres were surveyed for sensitive and rare plants, an increase of 10,813 acres from 1998. This increase in acres was due in large part to the Douglas-fir Bark Beetle Project on the IPNF. 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 9% 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, 1999), 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

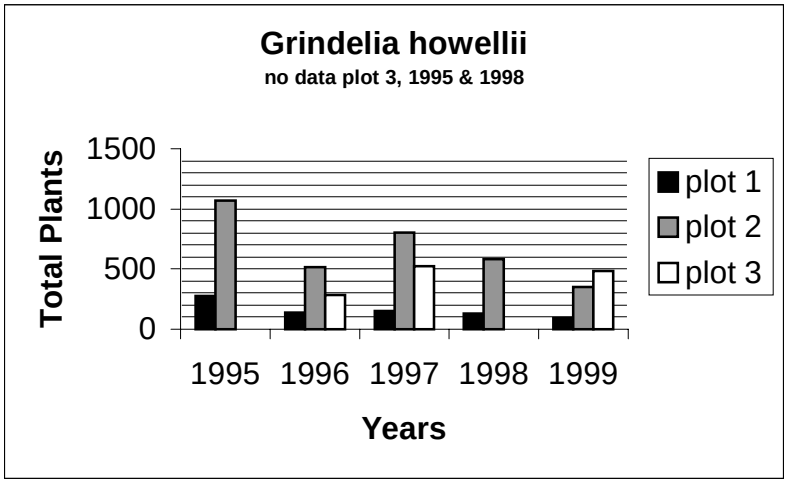
Land Management, and the Idaho Conservation Data Center have documented over 766 occurrences, for 80 rare species, mostly on federal lands. In 1999 there were 73 observations reported.

Figure 6. Rare Plant Observations, 1988 – 1999, 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 1999 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 18 and Figure 8.

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 1998 to 1999 is a slight reduction in total plants. Plot 1 went from 129 to 95, and Plot 2 went from 581 to 349. All the plots have had the same type of cyclic trends, likely a response to the same environmental stimuli: precipitation, snow-pack, etc. The 5-year trend is slightly down, and concern for this species remains high. Monitoring will continue in 2000. 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 14. Grindelia summaries, 1995-1999 (Germ = germinant; NFAD = non-flowering adult; FADS = Flowering adult. Average flowers is average flowers per flowering plant)

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
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
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

Reference: Idaho Conservation Data Center, 1999. 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 - 1,985 (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 - 8

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 - 23

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 - 29 (This includes the twenty-three operations on which surface disturbance has occurred and six 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

The objectives of this monitoring item are: (1) to determine if management prescriptions and practices are following direction contained in the Forest Plan to achieve Desired Future Condition. (2) To determine if Best Management Practices, standards and guidelines are being implemented and are effective in protecting resource values while working toward Desired Future Condition.

Background

Item K-1 has been monitored in two ways:

1) Project inspections by IPNF interdisciplinary teams to see if projects meet Best Management Practices and Forest Plan standards, and
2) Soil quality monitoring

Project inspections by IPNF interdisciplinary teams were conducted annually from 1988 to 1992, and in 1994 and 1995. The results of these inspections have been reported in Forest Plan Monitoring Reports for those years.

Monitoring Data

Our Forest soil resource objectives are to maintain and restore long-term productivity, to support healthy vegetative communities, and to protect watersheds. Key elements of maintaining long-term soil productivity include retaining surface organic layers and surface volcanic ash, and maintaining the bulk density of the surface volcanic ash within its natural range of variability.

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

- Compaction
- Removal of topsoil (displacement)
- Land taken out of production by roads, landings and skidtrails
- Units with insufficient woody-debris left on-site
- Areas that have been severely burned

Definitions of detrimental impacts:

- *Detrimental Compaction*: More than 20% increase in bulk density over natural for volcanic ash surface soils.

- *Detrimental Displacement*: Removal of the forest floor litter layer and one inch or more of the surface mineral soil over a 25 square foot (or more) area.

- *Severely Burned:* The soil surface is in a condition where most woody debris and the entire forest floor are 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 exist at 30 percent or greater (Graham et, al, 1994. Managing Coarse Woody Debris in Forests of the Rocky Mountains. U.S. Department of Agriculture, Forest Service, Intermountain Research Station. Research Paper INT-RP-477).

This year's monitoring focused on: 1) harvest units that were ground based harvested and grapple piled. The sale areas monitored were the Willow Creek sale on the St. Joe Ranger District and the Horizon sale on the Coeur d' Alene River District. 2) A winter, cut-to-length harvester and log forwarder operation on the Nordman sale was monitored at the Priest Lake Ranger District. Snow depths ranged from one to two feet during operations.

1) Units 11 and 16 were monitored on the Willow Creek sale area and unit 74 was monitored on the Horizon sale area. Detrimental compaction amounted to 13 percent on unit 11, 15 percent on unit 16, and 13 percent on unit 74. All units monitored meet Regional and Forest Plan soil quality standards from a soil compaction standpoint.

   All three units met the fine organic matter guidelines and two of three units met the coarse woody debris guidelines. All three units were in the western hemlock or western red-cedar habitat type and the recommended range of coarse woody debris and fine organic matter for these habitat types would be 17 to 33 tons per acre of coarse woody debris and fine organic matter contents of 30 percent or greater. Unit 11 had 21 tons per acre of coarse woody debris and 33 percent fine organic matter levels. Unit 16 had 28 tons per acre of coarse woody debris and 36 percent fine organic matter levels. Unit 74 had 8 tons per acre of coarse woody debris and 34 percent fine organic matter levels.

2) Unit 4 was monitored on the Nordman Sale. Detrimental compaction amounted to 8 percent, which is well within Regional and Forest Plan soil quality standards. The coarse woody debris tonnage was below recommended guidelines at 11 tons per acre and fine organic matter was 31 percent that met soil standard guidelines.

Evaluation

The results of the 1999 monitoring indicates that a good job is being done in meeting compaction, displacement, and fine organic matter soil quality standards, but coarse woody debris did not meet recommended guidelines on half of the units monitored.

Two Forest-wide soil quality workshops were conducted as a result of this monitoring to insure that future harvest units will retain adequate levels of coarse woody debris and to re-emphasize the importance of achieving all soil quality standards.

V. 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, and fire.

Ecosystem Restoration

The scientific assessment of the interior Columbia River basin describes north 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 long-lived shade-intolerant tree species, such as white 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 replacing white pine and larch, the stocking, the number of trees per acre, may have increased markedly. We also have fewer large trees and more uniform areas dominated by small and medium-sized trees. Combined, these two factors greatly increase the risk of severe fire, drought damage, and insect and disease attack.

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, reduce stand densities, increase the proportion of white pine, larch, and ponderosa pine, create larger stands, 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 treatment of forested areas.

IPNF Restoration Activities, 1992-1999

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 6,012 acres were planted to these species in 1999. (This includes the new, more rust resistant white pine). These three species tend to be more resistant to root rot disease.

- From 1992-1999 there were 62,852 acres planted to these species.

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 1999 the IPNF planted over 552,000 rust resistant white pine seedlings.

- From 1992 through 1999 the Forest planted over 9,514,000 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) Reducing stocking

- 2891 acres were thinned in 1999. Most of the thinning has released larch, white pine, and ponderosa pine.

- From 1992-1999, 55,393 acres were thinned.

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

- 11,964 acres of prescribed burning were accomplished in 1999.
- From 1992-1999 there were 68,235 acres of prescribed burning on the IPNF.

5) Watershed Improvement and Improved Fish Habitat

- 713 acres of watershed improvement were accomplished in 1999.
- From 1992-99 there were 8,249 acres of watershed improvement and 182 miles of fish habitat improvement.

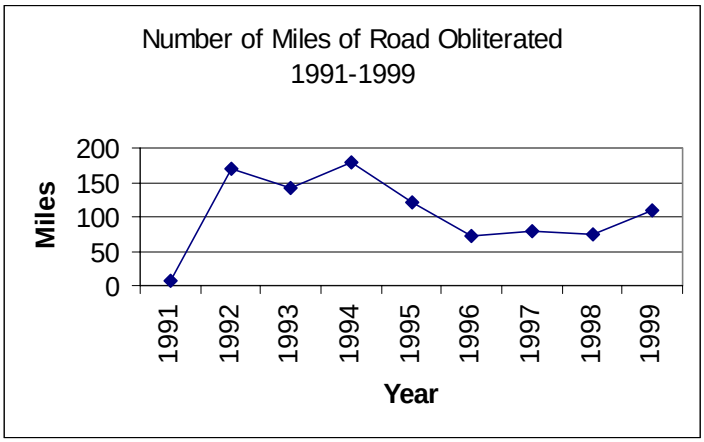
6) Road obliteration/decommissioning

- There were 110.2 miles of road obliterated in 1999 as part of ecosystem restoration work, using a variety of funds.
- Table 15 shows that there were 960 miles of road obliteration on the IPNF from 1991-1999. System roads are generally the ones that are inventoried, maintained and managed by the forest. The other roads are not.

Table 15. Number of miles of roads obliterated, 1991-1999

YEAR	SYSTEM ROADS	OTHER ROADS	TOTAL MILES OBLITERATED PER YEAR
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
TOTALS	**733.7**	**226.0**	**959.7**

Figure 8. Miles of Road Obliterated, 1991-1999



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.

Inventoried Roadless Areas

In October of 1999, President Clinton directed the Forest Service to develop a proposal to protect over 40 million acres of inventoried roadless areas on National Forests. This process was initiated with the publication in the Federal Register of a Notice of Intent to prepare an Environmental Impact Statement to examine alternative methods to meet the goals established by the President.

As part of the scoping process over 180 public meeting were held around the United States. The purpose of these meetings was to provide an opportunity for people to discuss and comment on the President's Roadless Initiative. The meeting on the Idaho Panhandle National Forests was held in Coeur d'Alene in December of 1999.

The Forest Service Roadless Area Conservation Draft Environmental Impact Statement (DEIS) became available in May of 2000. Meetings were held first to provide information on the contents of the DEIS and later for the public to provide oral comments on the document. The IPNF held meetings in Coeur d'Alene, Bonners Ferry, Kellogg, and Spokane.

The Final Environmental Impact Statement became available in November of 2000. The Record of Decision is projected to be available in December of 2000 or January of 2001.

People wanting information on the status of the process may want to periodically check the Forest Service Washington Office roadless website http://roadless.fs.fed.us

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. The information presented below represents our most up-to-date information.

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 we're concerned about old growth distribution. 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 16 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 16. 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. These frequent low-severity fires were the keystone natural process that maintained dry site old growth. The frequent low-severity fires both thinned out smaller trees (thus limiting moisture demands on these dry sites), and also reduced dead woody fuels and live ladder fuel accumulations that would have otherwise increased the risk of stand replacing wildfires.

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 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. 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 approximately 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 on these 340 acres. 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

activity begins to restore the natural disturbance processes that maintained 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

Background and factors limiting population: The Canada lynx was proposed for listing under the Endangered Species Act in July of 1998. The Forest Service will play an important role in lynx protection because much of the known or potential habitat is on national forest land.

In April 1999 a Draft Canada Lynx Conservation Assessment and Strategy was completed and became available. This document was developed to provide a consistent and effective approach to conservation of Canada lynx on federal lands in the conterminous United States.

The Idaho Conservation Data Center (CDC) has records of 34 lynx in the Idaho Panhandle prior to the 1987 Forest Plan. Trappers interviewed by the Forest Service in 1998 listed 13 other areas where they had observed lynx before 1968 and 1 was observed in 1980.

Snowshoe hare are the main prey for lynx and highest densities occur in young forests (15 to 30 years old). The limiting factors for this species are suitable amounts and distribution of foraging habitat, and possibly increased competition thru snow compaction from snowmobiles that would allow increased access by other predators. Because foraging habitat consists mostly of dense, young forests, it does not last long on the landscape before growing into a structure that does not provide good foraging for lynx. The amount of lynx foraging is declining compared to what occurred before wildfires were suppressed.

Denning habitat occurs where there are mature and old growth forests with abundant down logs. Much of the forest burned early in the 1900's. It is not yet old enough to have abundant down logs. Salvage logging that has removed dead and dying trees has contributed to the shortage of down logs in some areas.

1999 Monitoring Activities: Hair snares were set up at 348 locations on the North and South Zones to detect lynx. Twenty-seven hair samples were sent to a laboratory for DNA analysis to determine which are lynx. The results of the DNA analysis are not yet available and so will be reported in next year’s monitoring report.

Three remote sensing cameras were also set up for a month at baited stations, but none photographed a lynx. Five incidental sightings of lynx were also reported: three on the North Zone and one on the Central Zone.

Fire

To sustain the diversity of our forests we need to understand the natural disturbance processes that historically affected 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 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 as the name indicates cause high mortality in canopy trees throughout most of the stand. Mixed severity fires have varying effects on the canopy, both lethal and nonlethal, and produce irregular, patchy mosaics. Low severity fires cause little mortality in mature trees.

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 the IPNF has seen major changes in forest tree species composition and structure 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. Blister rust has been one of the most significant factors. This introduced disease has killed over 90% of the formerly dominant white pine, and 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 17 shows fire occurrence data for the IPNF. For 1959 through 1999 the total number of fires per year ranged from 44 in 1993 to 586 in 1994. The data for total number of acres burned per year is for a shorter period of time: 1969 through 1999. During this period the total number of acres burned per year varied from 4 in 1993 to 3221 in 1970.

Wildfires are now largely suppressed by human beings (especially low and mixed severity fires). In 1999, the IPNF responded to 161 wildfires that were suppressed after burning only 87 acres. About 79% of the fires were natural (lightning caused) and 21% were human caused. We also disposed of brush and slash from timber harvest activities on 2,323 acres, and natural fuels from 9,641 acres.

For the 12 years since the Forest Plan was adopted (1988-1999), the IPNF has responded to 1880 wildfires, which burned 7307 acres. Our last major stand replacing wildfire occurred in 1967. Without human suppression, over a historically typical 7-year period, wildfires might have burned 217,000 acres (although only 91,000 would have been severe 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 risk from root disease 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 17. Idaho Panhandle National Forests Fire Occurrence, 1959-1999

YEAR	TOTAL FIRES	LIGHTNING FIRES	PERSON FIRES	LIGHTNING ACRES	PERSON ACRES	TOTAL ACRES
1999	161	127	34	20	67	87
1998	198	166	32	60	2	62
1997	78	66	12	11	6	17
1996	117	87	30	30	290	320
1995	87	56	31	8	15	23
1994	586	530	56	2417	74	2491
1993	44	23	21	1	3	4
1992	137	106	31	20	397	417
1991	122	76	46	11	2530	2541
1990	97	48	49	5	140	145
1989	138	99	39	92	86	178
1988	115	58	57	316	706	1022
1987	126	56	70	11	274	285
1986	171	125	46	31	852	883
1985	137	93	44	771	12	783
1984	254	182	72	33	16	49
1983	59	24	35	0	374	374
1982	140	91	49	13	20	33
1981	142	94	48	10	14	24
1980	75	52	23	10	12	22
1979	321	201	120	110	2585	2695
1978	71	40	31	5	47	52
1977	267	188	79	23	67	90
1976	106	59	47	2	84	86
1975	101	58	43	9	70	79
1974	278	158	120	183	1735	1918
1973	155	69	86	13	1526	1539
1972	181	148	33	7	117	124
1971	151	105	46	49	112	161
1970	328	267	61	51	3170	3221
1969	108	37	71	96	171	267
1968	109	64	45			
1967	237	172	65			
1966	154	105	49			
1965	141	102	39			
1964	137	113	24			
1963	432	372	60			
1962	268	205	63			
1961	309	259	50			
1960	137	65	72			
1959	123	86	37			

Appendices

Appendix A. IPNF Forest Plan Monitoring Requirements

Appendix B. Forest Plan Amendments

Appendix C. List of contributors to monitoring report

Appendix A. IPNF Forest Plan Monitoring Requirements

Table 18.

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 to Monitoring Report

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