Idaho Panhandle National Forests

FOREST PLAN

MONITORING AND EVALUATION REPORT

2002

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I. INTRODUCTION

The monitoring and evaluation process compares the end results that have been achieved to the projections made in the Forest Plan. Costs, outputs, and environmental effects, both experienced and projected, are considered. This process comprises a management control system, which provides information to the decision maker and the public on the progress of implementing the Forest Plan. Monitoring is designed to gather data necessary for the evaluation. During evaluation, date provided through the monitoring effort are analyzed, interpreted, and then used to determine if the implementation of the Forest Plan is within the bounds of the plan. Annual reports have been prepared from FY 1988 through FY 2001.

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

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

This report also includes information on a number of topics not required by the Forest Plan but important to forest management. These subjects are: ecosystem restoration, old growth, whitebark pine, Canada lynx, bald eagles, elk habitat potential, bats and mines, flammulated owls, northern goshawks, Harlequin ducks, black-backed woodpeckers, white-headed woodpeckers, and fire.

II. SUMMARY OF FINDINGS

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

- The Forest Plan established an average annual allowable sale quantity (ASQ) of 280 million board feet (MMBF) for the first decade after the plan was adopted. This was to occur on an estimated 18,688 acres annually. The Plan specified that the ASQ could increase to 350 MMBF in the second decade. The actual amount of timber sold has been much lower than anticipated in the Plan. In FY 2002, 57.2 MMBF was offered, 55.4 MMBF was sold, and 41 MMBF was harvested. The number of acres sold was 5,383. Payments to counties in FY 2002 totaled $8,056,567.

- The woodland caribou population trend has been stable for the last year, at 30-35 caribou for the Selkirk Ecosystem, which includes portions of the U.S. and Canada. Grizzly bear habitat was slightly improved over 2001, with seven of fifteen Grizzly Bear Management Units meeting all core and road density standards.

- The Forest was under 10% allowable departure from Forest Plan direction in Visual Quality for FY 2002. Sales pending completion will be reviewed upon their completion in following reports. With the majority of harvest employing partial cut methods in FY 2002, the percentage of clearcut (less than 3% in 2002 of a total of approximately 85,000 harvested acres between FY 1992 and 2002) continues to decline.

- Three harvest systems – winter felling and decking with a harvester and summer/fall helicopter log removal, cut to length harvester and log forwarder, and past horse logging – were monitored for detrimental impacts to long term soil productivity. Detrimental impacts are compaction, removal of topsoil (displacement), insufficient organic matter and coarse woody-debris left on-site, and areas that have been severely burned. Compaction was the only detrimental impact that occurred in the units. Each unit experienced detrimental compaction; however, all of the units in which the three harvest systems were monitored met the Regional and Forest Plan soil quality standards.

- The purpose of heritage monitoring is to insure that projects do not cause adverse effects to heritage resources. The threshold of concern is any unmitigated adverse impact. The Forest monitors disturbing projects to identify potential impacts to heritage resources. The overall conclusion of the monitoring in FY 2002 is there were no adverse effects on significant heritage resources resulting from forest projects.

- The USFWS has determined that habitat exists on the Idaho Panhandle for Silene spaldingii (Spalding's catchfly.) In the spring of 2000, Botanists developed a process to predict potential habitat (e.g. grasslands) utilizing the SILC (Satellite Imagery Land-cover Classification) data. Broad-scale and project level surveys were conducted during the field season of FY 2001 and 2002 to validate predicted habitat and search for populations. No populations of Spalding's catchfly have been found to date on the Forest.

- Forest monitoring of Best Management Practices (BMP) indicates that in most cases they continue to function as expected and are meeting their intent. Feedback from monitoring was used to adjust certain BMP's. Updated information is also provided on some projects described in previous monitoring reports. The Forest continued nine of its long-term water quality monitoring stations.

- In conjunction with Idaho Department of Fish and Game, we conducted annual survey of a subset of streams on the IPNF. The primary focus of these surveys has been westslope cutthroat trout and bull trout. Based on current information, bull trout and westslope cutthroat trout populations appear to be stable throughout most of north Idaho. Redd count data in the Pend Oreille basin show that bull trout populations are stable and may be increasing, while populations in the Priest basin appear to be declining, and populations in the St. Joe basin appear mixed.

- We are continuing to look for opportunities to use funds from a variety of sources to restore ecosystems. Examples of Forest ecosystem restoration work for FY 2002 are listed below. See the Ecosystem Restoration section of this report for more details.
    - Planting approximately 494,646 rust resistant white pine seedlings.
    - Planting approximately 3,159 acres of white pine, larch and ponderosa pine. These are species that are in short supply on the IPNF.
    - Reducing forest density by thinning 3,782 acres; most of this released larch, white pine and ponderosa pine.
    - Pruning 2,597 acres of white pine saplings. This reduces mortality from white pine blister rust.
    - There were 3,330 acres of harvest related natural fuel reduction and 4,516 acres of natural fuel reduction.
    - Improving 150 acres of soil and water resources.
    - Decommissioning 59.2 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 276,494 acres (12% of our forested acres) to be retained as old growth. We have an additional 5,859 acres (0.3% of our forested acres) of field verified unallocated old growth, which provides old growth habitat for wildlife and serves other ecological functions.

- Table 1 is a quantitative summary of some of the Forest's other accomplishments for FY 2002.

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

III. MONITORING ITEMS

This section contains the monitoring and evaluation results for FY 2002 for some of the thirteen monitoring items discussed in this year's report.

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

Table 1. Quantitative Estimates of Performance Outputs and Services

Outputs and Services	Quantitative Estimates
Budget	$39,925,000
Total number of employees	470 (permanent and temporary)
Volume of timber offered	57.2 million board feet
Volume of timber sold	55.4 million board feet
Volume of timber harvested	41 million board feet
Total acres of timber sold	5,383 acres
Payments to counties	$8,056,567
Total reforestation completed	3,225 acres
Total number of seedlings planted	1,464,669
Timber stand improvement completed	3,782 acres
Pruning of white pine	2,597 acres
Soil and water improvement completed	150 acres
Roads maintained	2,286 miles
Roads constructed	1.3 miles
Roads reconstructed	23.5 miles
Roads decommissioned	59.7 miles
Trails constructed/reconstructed	18 miles
Trails maintained to standard	560 miles
Number of wildfires	112 fires
Acres burned by wildfire	66 acres
Harvest related fuel treatment	3,330 acres
Hazardous fuels reduction	4,516 acres
Wildlife habitat restored	4,413 acres
Wildlife habitat inventoried	12,692 acres
TES terrestrial habitat inventoried	1,500 acres
Noxious weeds treated	4,312 acres
Abandoned/inactive mines	16

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

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

A. Payments to Counties

Background

In the past, the Forest Service paid out 25 percent of its annual revenues collected from timber sales, grazing, recreation, minerals, and land uses to states in which national forest lands were located. The amount a county received depended upon the amount of these activities that occurred there and the amount of national forest land within it.

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

Monitoring Data

Table 2. Payments to Counties with Harvested Timber Volume

Fiscal Year	Payments (MM$)	Volume (MMBF)
1991	5.4	232
1992	7.4	235
1993	6.0	134
1994	6.4	117
1995	5.8	87
1996	6.0	81
1997	3.9	57
1998	4.8	85
1999	3.1	75
2000	4.0	90
2001	8.0	51
2002	8.1	41

Table 3. Distribution of Payments to Counties, FY 1991-2000

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

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

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

Table 4. Distribution of Payments to Five Northern Idaho Counties, FY 2001

County	Total Disbursement	% Split Title II/Title III	Title II (Forest Projects)	Title III (County)
Benewah	$115,381.00	50/50	$8,653.55	$8,653.55
Bonner	$1,390,140.00	10/5	$139,013.98	$69,506.98
Boundary	$1,388,722.00	50/50	$104,154.11	$104,154.11
Kootenai	$1,011,683.00	3/12	$30,350.49	$121,401.96
Shoshone	$4,079,756.00	3/12	$122,392.67	$489,570.72
TOTAL	$7,985,683.00		$404,564.80	$793,287.32

Table 4 shows the payments made for FY 2001 to the five Northern Idaho counties in accordance with the Secure Rural Schools and Community Self-Determination Act of 2000 (Public Law 106-393). Under this legislation, payment amounts are determined based upon each counties share of the average of the three highest 25 percent fund payments made to the state during the base period (FY's 1986 through 1999). This act also provides that 15 to 20 percent of the total disbursement to each county can be used to finance either Forest Service (Title II) or County (Title III) projects, as determined by each county. Depicted in this table is the total disbursement to each county, as well as the percentages and amounts distributed between Title II and Title III funded projects. Table 5, below, shows the same information for FY 2002.

Table 5. Distribution of Payments to Five Northern Idaho Counties, FY 2002

County	Total Disbursement	% Split Title II/Title III	Title II (Forest Projects)	Title III (County)
Benewah	$116,303.73	50/50	$8,722.78	$8,722.78
Bonner	$1,401,260.96	10/5	$140,126.08	$70,063.03
Boundary	$1,399,831.45	12.75/2.25	$178,478.51	$31,496.20
Kootenai	$1,026,776,54	100	$159,966.47	$0
Shoshone	$4,112,394.21	100	$616,859.13	$0
TOTAL	$8,056,566.89		$1,104,152.97	$110,282.01

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 6. Total Number of Employees

Fiscal Year	Employees
1991	714
1992	762
1993	743
1994	669
1995	575
1996	552
1997	525
1998	514
1999	526
2000	486
2001	475
2002	470

Figure 1. Total Number of Employees

Evaluation: Table 6 and Figure 1 show the way our workforce has changed from 1991 to 2002. We went from a high of 762 permanent and temporary employees in FY 1992, to 470 at the end of FY 2002. This loss of employment has had a greater effect on the smaller communities such as Bonners Ferry, Wallace and St. Maries than on communities like Coeur d'Alene and Sandpoint where significant population growth has occurred during the same time period.

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

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

Background

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

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

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

Monitoring Data

FY 2002: For this fiscal year the Idaho Panhandle National Forests offered 57.2 million board feet of timber for sale. We sold 55.4 million board feet.

FY 1991-2002: Table 7 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. Figure 3 shows total acres sold.

Table 7. Timber Volumes Offered and Sold (MMBF) and Total Acres Sold

Fiscal Year	Volume Offered	Volume Sold	Total Acres Sold
1991	201.6	163.2	13,989
1992	127.2	108.0	10,508
1993	109.4	124.3	13,939
1994	44.9	16.4	4,283
1995	64.1	37.5	8,437
1996	75.4	42.9	8,631
1997	79.3	108.3	10,914
1998	76.3	90.3	6,974
1999	63.4	30.3	8,751
2000	76.3	78.2	7,332
2001	65.8	40.7	5,626
2002	57.2	55.4	5,383

Figure 2. Timber Volume Offered and Sold

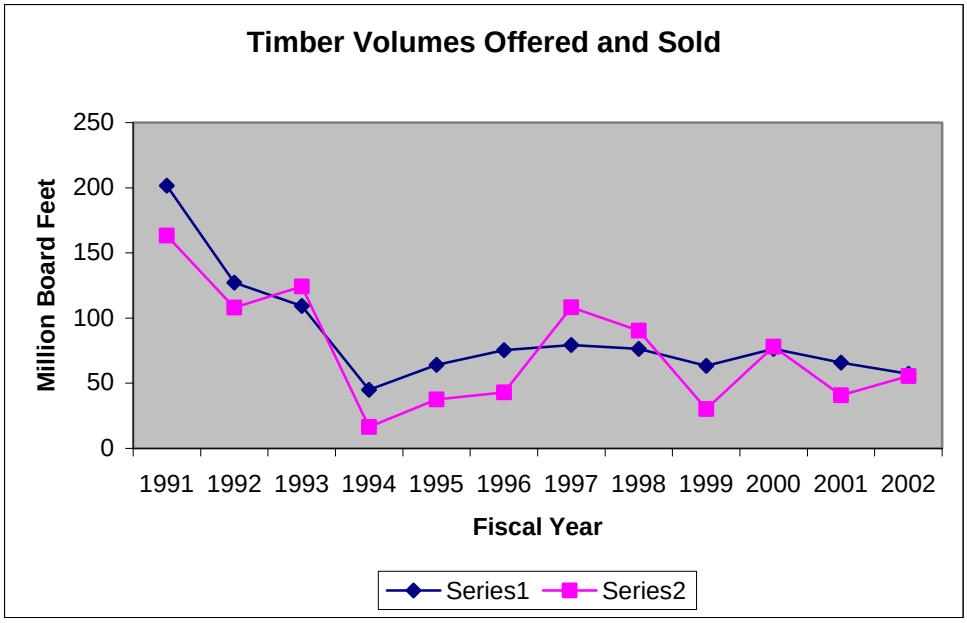
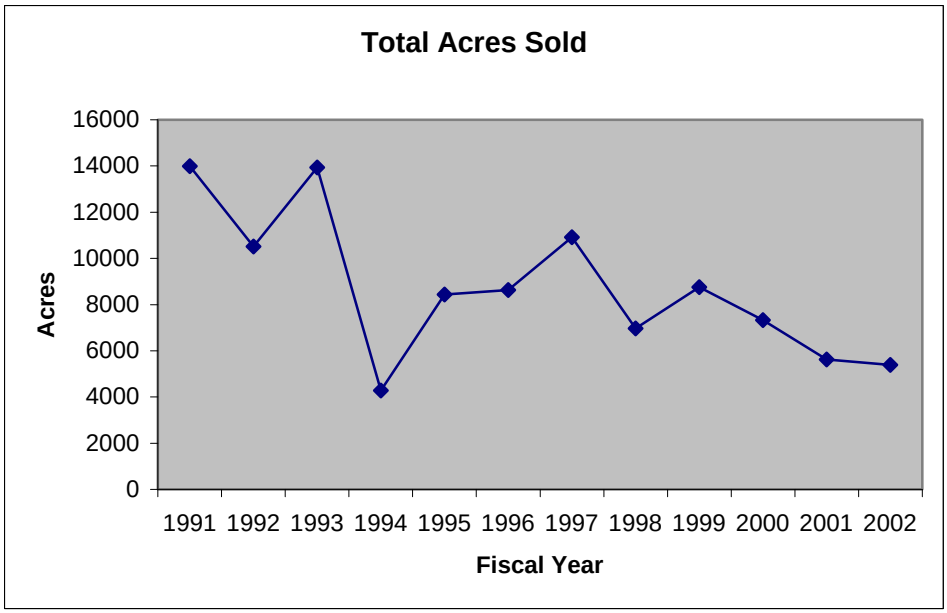


Figure 3. Total Acres Sold



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

Evaluation

For FY 1988 through 1990 the volume of timber sold and acres sold exceeded the 75-percent threshold identified in the Plan. From FY 1991 through 2002 volume sold and acres sold has fallen below that threshold.

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

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

Forest Plan Monitoring Item C-1: Visual Quality

Item C-1 assesses our effectiveness managing the scenic resource to meet the established Forest Plan standards of scenic quality and diversity of natural features. This item requires annual assessment of how we have done in our project implementation. These standards for measuring scenic quality were established in the 1987 Forest Plan using the Visual Management System (VMS). A 10% departure from Forest Plan direction after five years initiates further evaluation. Over the last 15 years, increased skill in the implementation of salvage and commercial thinning methods and regeneration type harvest methods has resulted in more natural appearing, sustainable landscapes, and a good record for meeting our established Visual Quality Objectives or VQOs. The following is a summary of how we did during FY'02 meeting VQOs. Detailed reports are available at District Offices.

Table 8. Planning for meeting Visual Quality Objectives. The following 18 Timber Sales were advertised and/or sold in FY 2002. Visual analysis reports were completed for all of them. All were designed to meet assigned Forest Plan VQOs.

NORTH ZONE - PRIEST LAKE RANGER DISTRICT	
Timber Sale Name	**Was the sale planned to meet Forest Plan VQO's?**
No sales reported FY2002	
NORTH ZONE – BONNERS FERRY RANGER DISTRICT	
Deerskin Roundwood	Yes
Pipe Dream	Yes
Harebrush	Yes
NORTH ZONE – SANDPOINT RANGER DISTRICT	
Little Blacktail Timber Sale	Yes.
CENTRAL ZONE – FERNAN & WALLACE RANGER DISTRICTS	
Little U Celly Heli	Yes

Timber Sale Name	Was the sale planned to meet Forest Plan VQO's?
Unknown King Bug	Yes
East Side Beetle Heli	Yes
Callis Bug Ice	Yes
Iron Solitaire	Yes
Sands Creek	Yes
Scatterwall Heli Bug	Yes
SOUTH ZONE - AVERY & ST. MARIES RANGER DISTRICTS	
Rye on Ham	Yes
Can It	Yes
Pt. Siam	Yes
Flying Pine	Yes
Bird Cage	Yes
Liberate Slate	Yes
Jack Flash	Yes

Table 9. Results. Monitoring of Timber Sales Closed/Completed in FY 2002. IN FY'02 19 projects were implemented. The following chart provides a summary of results obtained from planning and implementing effective harvest methods to meet VQO's.

NORTH ZONE - PRIEST LAKE RANGER DISTRICT		
Timber Sale Name	**VQO's Met**	**Remarks**
Butch Creek	Yes	Complete

Outlet Sewer	Yes	Complete
Arts Project	Yes	Roadside Salvage – Road 2512

NORTH ZONE – BONNERS FERRY RANGER DISTRICT		
Meadow Dawson (See attached photos)	Yes	The Partial Retention Visual Quality Objectives were easily met from all of the viewpoints.

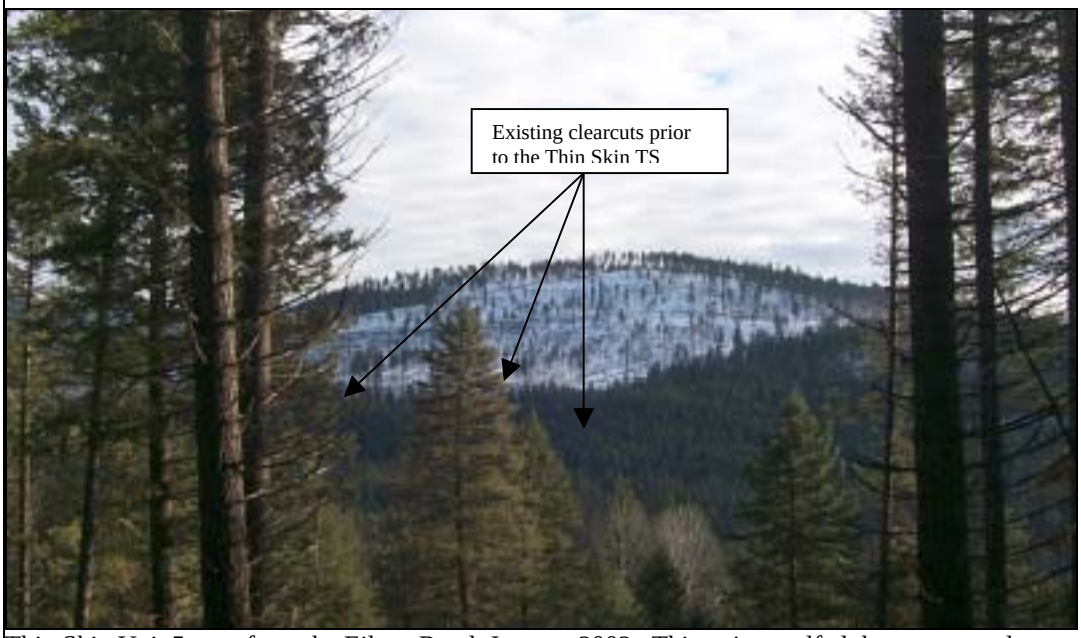
Meadow Dawson Timber Sale seen in the background from U.S. Highway 2 near the Bonners Ferry Airport

Below: Stampede Unit 15, 10/25/02 After Harvest and before slash disposal.

Thin Skin (see attached photos)	Yes	Project improved the visual appearance of the hillside.

Foreground view of the Meadow Dawson Timber Sale along the Baldy Road, #2538 Road. This unit was underburned in April, 2002.

Timber Sale Name	**VQO's Met**	**Remarks**
Gable McGinty	Yes	All of the units on the sale meet their required partial retention or modification VQO's.
Stampede (See attached photos Below : Before harvest Unit 15, 11/3/97)	Yes	All of the units meet the required VQO's.



Thin Skin Unit 5 seen from the Eileen Road, January 2002. This unit engulfed three rectangular clearcut units harvested in the 1980's. The rehabilitation cut eliminated the hard boundaries of the old square clearcuts. Barry Wynsma and Patrick Cooley (District Visual Management Paraprofessionals), October 28, 2002.

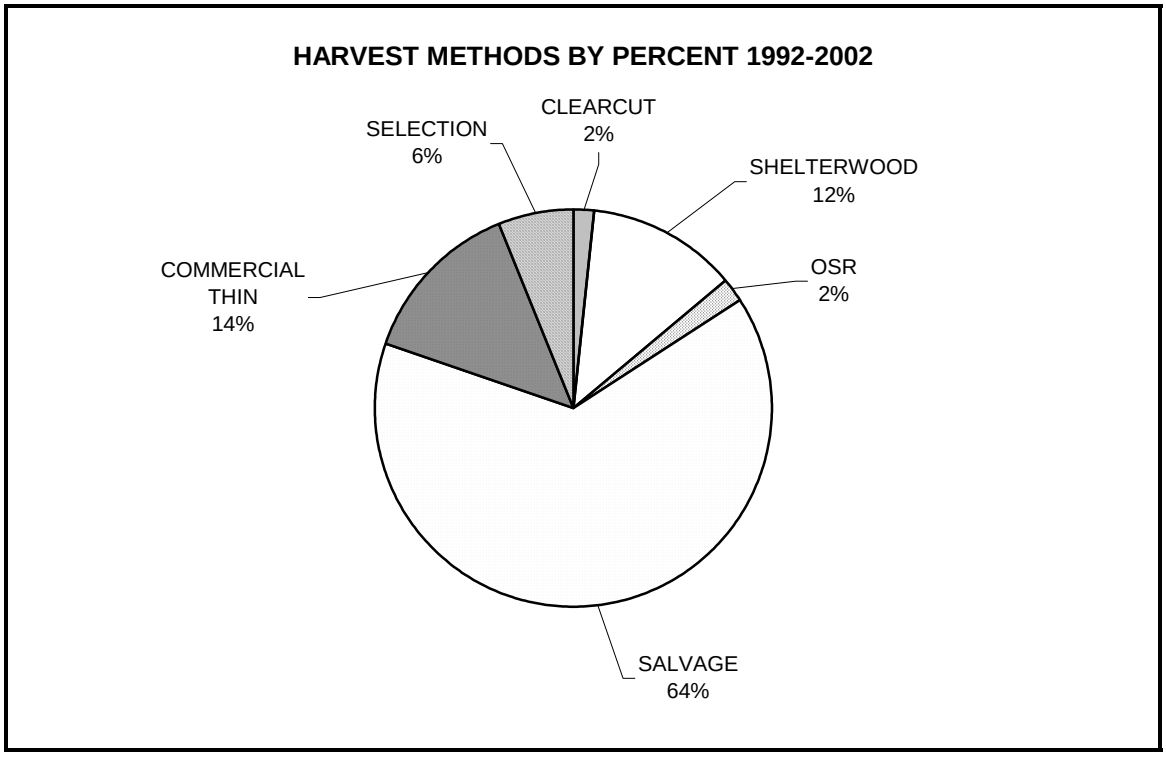
NORTH ZONE – SANDPOINT RANGER DISTRICT		
Timber Sale Name	**VQO's Met**	**Remarks**
No sales officially closed FY 2002		
CENTRAL ZONE – WALLACE & FERNAN RANGER DSTRICTS		
Ridge Run	Yes	
Avista Beaver	Yes	
Windy Buttes	Not complete	Burning remains; loggings meets VQO
Bunco right-of way	Yes	
Timber Sale Name	**VQO's Met**	**Remarks**
Cherry Heli Bug	Not complete	Burning remains, logging meets VQO
Beaver Heli Bug	Not complete	Burning remains; logging meets VQO

Yellow Horse Beetle	Not complete	Burning remains; logging meets VQO
Search 4 Horizon	Not complete	Burning remains, logging meets VQO
Fernan Beetle Heli	Not complete	Burning remains; logging meets VQO
Rookie Hart	Not complete	Field review needs to be done
SOUTH ZONE – AVERY & ST. JOE RANGER DISTRICTS		
Liberate Slate	Yes	Small sale from the East Slate E.A.
Get Shorty	Yes	Sale from the Charlie Tyson EIS

Summary: The Idaho Panhandle National Forests were under the 10% allowable departure from Forest Plan direction in meeting Visual Quality Objectives for FY 2002. Sales pending completion will be reviewed in the following report. The majority of projects employed partial cut methods in FY 2002. Less than 3% of harvests involving approximately 85,000 acres were harvested using clearcut methods between FY 1992 and 2002.

The Kootenai and Idaho Panhandle National Forests are currently involved with a joint Forest Plan revision effort. During the revision process, both forests are transitioning from Landscape Management Vol 2 ch1 " The Visual Management System" – Agriculture Handbook Number 462 to the state-of-the-art protocols directed in the revised Scenery Management System contained in Agriculture Handbook Number 701 (Vol. 2, ch1 in the National Forest Landscape Management Series) "Landscape Aesthetics: - A Handbook for Scenery Management". This will allow continued consistency with national direction and implementation of the required state-of-the-art procedures for scenery management.

Figure 4. Harvest Methods Used



(Total Harvested Acres:101,398)

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

Background

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

Monitoring Data

The principal sources of information for this monitoring item is the number of violations issued by Forest Service Law Enforcement Officers that are associated with off-road vehicle use. Listed below is the number of citations issued for FY 1991-2002.

Table 10. Total Number of Violations Issued

Fiscal Year	Number of Violations
1991	144
1992	167
1993	204
1994	185
1995	88
1996	133
1997	240
1998	246
1999	394
2000	164
2001	285
2002	191

Evaluation

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

Some violations by off-road vehicle users occur when no Forest Service personnel are around to witness them. For this reason the number of documented violations is not an accurate measure of the amount of actual violations or resource impacts. It can however be used as a general indicator of trends in violations and law enforcement activities associated with off-road vehicles. During FY 2002, 191 violations were noted.

Forest Plan Monitoring Item E-1: Heritage Resources

Background

The purpose of this monitoring item is to insure that projects do not cause adverse effects to heritage resources. The threshold of concern is any unmitigated adverse impact. The Idaho Panhandle National Forests monitors land disturbing projects to identify potential impacts to heritage resources. The overall conclusion of the monitoring in 2002 is there were no adverse effects on significant heritage resources resulting from forest projects.

Monitoring Data

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

b. *Lands*—The forest reviewed ten small tracts act cases for heritage resource concerns. Archaeologists determined that all of these proposed small tracts act sales had no effect on heritage resources.

c. *Roads*—The Forest consulted with the Idaho Department of Transportation concerning the reconstruction of a section of US Highway 95 from Copeland to East Port. This project is continuing into FY 2003 and no impacts on significant heritage resources are anticipated.

d. *Facilities*—A Passport In Time volunteer project in cooperation with the Region One Historic Preservation Team continued the restoration of the Red Ives Ranger Station, which is listed on the National Register of Historic Places. The work completed in 2002 included staining the exterior of buildings, repair of siding, repair of trim, reconstruction of window well covers, reconstruction of steps and continuing the work of restoration in the office interior.

The forest contracted for the replacement of the metal roofing on the office building at Red Ives. The Historic Preservation Team helped with the specifications for this contract. A contractor completed the roof replacement during the first weeks of October 2002.

The forest spent one week stabilizing the tower of Conrad Peak Fire Lookout. Wind induced flexing of the weathered wooden members of this lookout tower loosened the joints and the snow load broke some of the horizontal members at the base of the tower. The project replaced eleven of the horizontal and cross members on the lowest tear of this 53-foot tower, cleaned out the cab and removed the furnishings for cleaning and repair.

Region One Preservation Team member, Dale Swee, visited the forest in August, 2002 to review three proposed preservation projects. These projects included the garage building at the Priest Lake Museum, the barn at Bismark and the cabin at Hughes Meadows. Preservation planning is proceeding on the garage building and preservation work will commence during the spring of 2003.

e. *Trails*—An archaeological technician monitored the construction of the Kalispell Island trail for possible prehistoric heritage sites. The monitor concluded that no heritage resources were disturbed by the construction of the trail.

The forest cooperated with a local volunteer to locate and map with GPS equipment the Skeetshoo Road/Seneacquoteen Wagon Road. This is the route taken by David Thompson through Idaho during his travels in 1809-12. The route runs through a mixture of private, state and federal ownership. Some segments are clearly visible and others have been totally obliterated by later developments. The mapping work will allow the Forest to protect the segments under its management and possibly interpret some of it during the David Thompson bicentennial celebration starting in 2007.

f. *Special Use Permits*—The forest inventoried four special use permit proposals. The proposals were found to have no effect on any known heritage resources. In addition the forest monitored two ground-disturbing projects by permit holders around the edge of Priest Lake. The monitor concluded that no heritage resources were disturbed by these ground-disturbing projects.

g. *Recreation*—The forest proposed two new trailhead facilities, a new dock and a boat launch. The proposals were found to have no effect on any known heritage resources.

Forest Plan Monitoring Item F-2 Grizzly Bear Recovery

The grizzly bear is a federally listed threatened species. The U.S. Fish and Wildlife Service delineated recovery zones for grizzly bears in the 1993 Grizzly Bear Recovery Plan. The Selkirk Recovery Zone includes portions of the Colville and Idaho Panhandle National Forests, and extends into British Columbia, Canada. The Cabinet-Yaak Recovery Zone includes portions of the Kootenai, Lolo, and Idaho Panhandle National Forests. State and private lands are also included in both grizzly bear recovery zones.

Habitat for grizzly bears is measured annually in fifteen grizzly bear management units (BMUs) in the Selkirk and Cabinet-Yaak Ecosystems. The Selkirk Recovery Zone contains nine BMUs; five are on the Idaho Panhandle National Forests and four are shared with the Colville National Forest. Four of the Cabinet-Yaak BMUs are completely on the Idaho Panhandle National Forests; two are shared by the Idaho Panhandle and Kootenai National Forests. Each BMU except Lakeshore is approximately 100 square miles, the average home range of a female grizzly bear with cubs.

Security is a critical element of grizzly bear habitat. Roads often represent a major form of human intrusion into grizzly bear habitat, impacting grizzly bear security. Traffic on roads disrupts bear behavior and social dynamics, reduces the availability and use of adjacent habitats, creates barriers to movement, and leads to an increased risk of mortality.

The Forest Plan standards for monitoring grizzly bear habitat were changed in 2001. The Forest Service tracks:

* Percent core habitat (areas with no motorized access);
* Percent of a BMU with open road density greater than one mile per square mile (open roads are those with no restrictions on motorized vehicle use);
* Percent of a BMU with total road density over two miles per square mile; and
* Administrative use (number of vehicle round trips per BMU annually).

The new administrative use standards allow a certain number of vehicles on official Forest Service business to access gates which are closed to the general public. These include private vehicles which are authorized access to conduct Forest Service business. The maximum number of allowable administrative use vehicle trips for each gate is: 19 during spring (April 1 to June 14) + 23 during summer (June 15 to Sept. 14) + 15 during fall (September 15 to November 15).

Table 11. Grizzly Bear Habitat Status

2002 BMU Status	BMU Acres	Acres Core	% Core	Open Road Density - % of BMU with >1mi. open road/sq.mi.	Total Road Density % of BMU with >2 mi. total roads/sq.mi.
Goal =			**≥55**	**≤33**	**≤26**
SELKIRK BMUs:					
Ball-Trout	57,907	41,435	72	18	9
Blue-Grass	57,325	28,698	50	27	29
Boulder	62,368	30,484	49	29	35
Grouse (1)	66,979	27,651	32	59	59
Kalispell-Granite	85,641	40,251	48	31	29
Lakeshore	17,967	3,706	20	78	50
Long-Smith	65,737	48,203	73	23	13
Myrtle	63,781	38,272	60	30	19
North Lightning	65,216	39,713	61	38	20
Scotchman	61,612	38,848	63	35	27
CABINET-YAAK BMUs:					
Salmo-Priest	87,115	55,754	64	30	24
Sullivan-Hughes	78,210	48,294	62	23	20
Northwest Peaks (2)	82,995	45,929	55	28	26
Keno (3)	51,236	29,778	61	33	24
LeClerc	77,176	25,468	33	24	49

Footnotes:

(1) No private roads contributed to the Grouse BMU calculation.
(2) Northwest Peaks – 18,588 acres are on Idaho Panhandle National Forests.
(3) Keno – 23,054 acres are on Idaho Panhandle National Forests

Seven BMUs met core and road density standards and guidelines in 2002. This is an improvement for Keno BMU, which had not met the standards in 2001. These BMUs met the standards in 2002 and the previous year: Ball-Trout, Long-Smith, Myrtle, Northwest Peaks, Salmo-Priest and Sullivan-Hughes. The other eight BMUs did not meet one or more management criteria for grizzly bears in 2002.

Table 12. Core, Security, Road Density Standards and Guidelines

	% Core	% of BMU with open road density > 1 mi. per	% of area with total road density > 2 mi. per	Administrative Use
Goal =	**55% or more**	**33% or less**	**26% or less**	19 or fewer spring trips 23 or fewer summer trips 15 or fewer fall trips
SELKIRK BMUs:				
Ball-Trout	meets	meets	meets	meets
Blue-Grass	doesn't meet	meets	doesn't meet	meets
Kalispell - Granite	doesn't meet	meets	doesn't meet	meets
Lakeshore	doesn't meet	doesn't meet	doesn't meet	meets
LeClerc	doesn't meet	meets	doesn't meet	meets
Long-Smith	meets	meets	meets	meets
Myrtle	meets	meets	meets	meets
Salmo-Priest	meets	meets	meets	meets
Sullivan – Hughes	meets	meets	meets	meets
CABINET-YAAK BMUs:				
Boulder	doesn't meet	meets	doesn't meet	meets
Grouse	doesn't meet	doesn't meet	doesn't meet	meets
Keno	meets	meets	meets	meets
North Lightning	meets	doesn't meet	meets	meets
Northwest Peaks	meets	meets	meets	meets
Scotchman	meets	doesn't meet	doesn't meet	meets

Forest Plan Monitoring Item F-3 Caribou Recovery

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

Background

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

Caribou are generally found in Engelmann spruce/subalpine fir and western redcedar/western hemlock forest types above 4,000 feet elevation in the Selkirk Mountains, but occasionally use valley bottom habitats in the Kootenai and Priest Lake Basins. Caribou are adapted to boreal forests and only occur in drier, low elevation habitats except as rare transients. Seasonal movements are complex. Caribou frequently cross the U.S. / Canada international border. Earlier this century, caribou occurred as far south as Lewiston, Idaho; now they are restricted in the lower 48 states to the northern portion of the Idaho Panhandle National Forests and northeastern Washington.

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

Forest Plan Direction

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 and continued research on caribou habitat preferences have indicated that the Forest Plan's five seasonal habitats are not distinct; caribou habitats overlap in several seasons. Habitat analyses continue 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 target conditions is a long-term process, resulting from natural succession or manipulation of vegetation. The Forest Service continues to implement recommendations of the caribou steering committee and recovery teams; support Idaho

Department of Fish and Game and Washington Department of Fish and Wildlife in winter caribou censuses and monitoring radio-collared caribou; and support research on predation and other factors that are preventing the recovery of this species.

The estimated population for woodland caribou in the Selkirk Ecosystem has remained constant for the last year, at 30 to 35 animals. The population is considered to be stable at this time. Monitoring of radio-collared caribou this year did not detect any losses from predation, although predation continues to be a significant factor which may impact caribou populations. Mountain lions are believed to be the predominant predator on caribou in the Selkirk Ecosystem. One female caribou which was among twelve transplanted to the South Selkirks in 1999 had moved to the South Purcell Mountain caribou herd, and returned to the Selkirk Ecosystem in 2002.

Beginning in 2002, the Idaho Panhandle National Forests, Colville National Forest and the Washington Department of Fish and Wildlife initiated a cooperative project verifying caribou habitat in the United States portion of the South Selkirk caribou recovery area. Habitat conditions on approximately 6,000 acres of caribou habitat on the Idaho Panhandle National Forests were evaluated for their suitability for caribou. Habitat information which was collected and quantified included lichen abundance, forest type and habitat structure.

Forest Plan Monitoring Item G-2: Water Quality

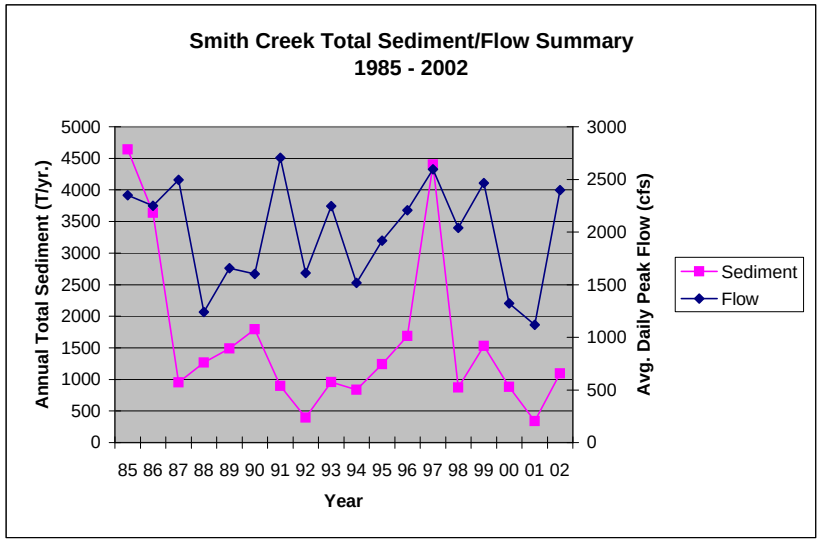
Item G-2 describes the monitoring efforts that check and evaluate the implementation and effectiveness of forest management activities on watersheds, water resources, and their beneficial uses within the Forest. Practices include Best Management Practices (BMP) monitoring, which cover implementation and effectiveness monitoring of activities that took place in FY 2002.

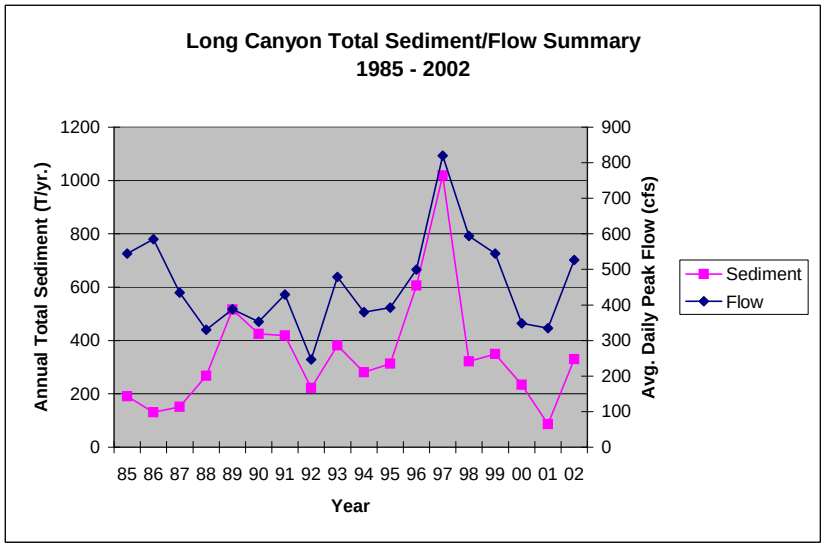
The objectives of BMP monitoring are to check that BMPs are applied and implemented as designed (implementation monitoring), that they are effective in controlling non-point sources of pollution (effectiveness monitoring), and are protecting water quality and beneficial uses as intended (validation monitoring).

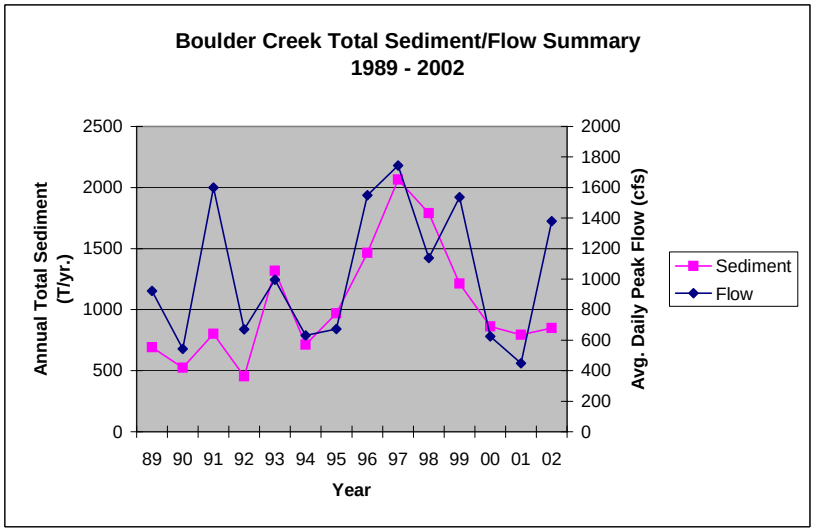
Following are the results of the FY 2002 monitoring efforts on the Forest.

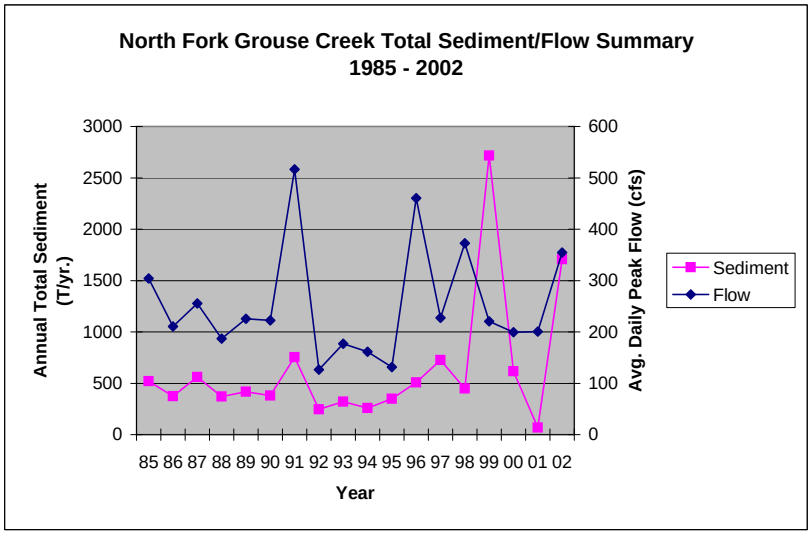
Forest monitoring of Best Management Practices (BMP) indicates that in most cases they continue to function as expected and are meeting their intent. Feedback from monitoring was used to adjust certain BMP's. Updated information is also provided on some projects described in previous monitoring reports. The Forest continued nine of its long-term water quality monitoring stations.

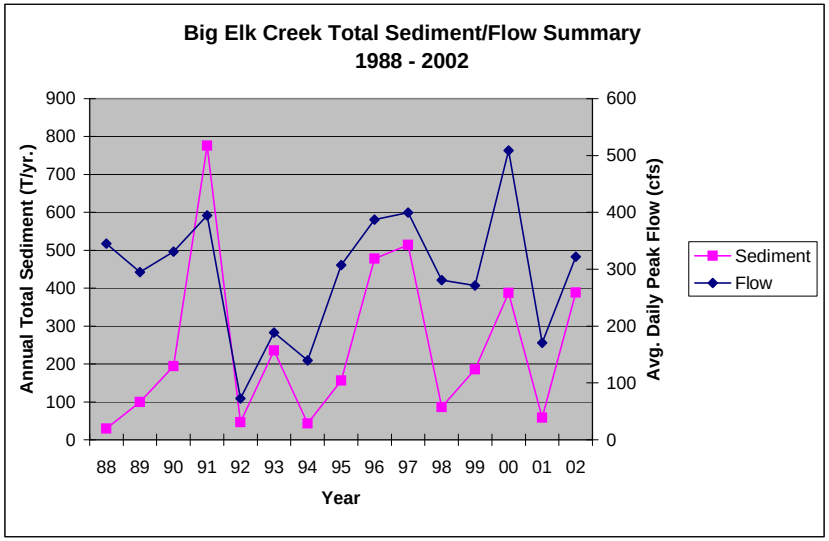
Eight long-term Forest Plan water quality monitoring stations with water level recorders were maintained through the FY 2002 water year (10/1/2001-9/30/2002). Although continued validation of watershed assessment tools were not complete at the time of this year's publication, the record of two parameters are plotted in the charts on pages 30 and 31. Each chart displays the total sediment and maximum discharge observed over the period of record for each station.

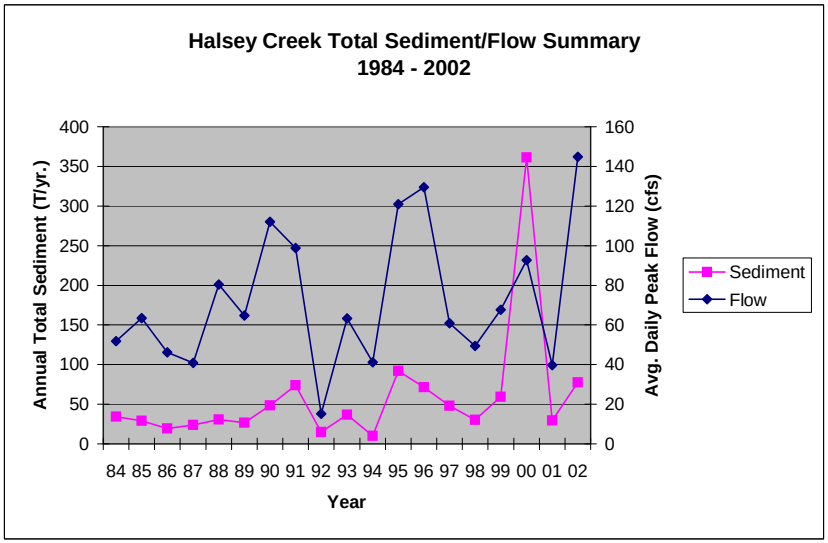

Smith Creek Total Sediment/Flow Summary
1985 - 2002
Annual Total Sediment (T/yr.)
Avg. Daily Peak Flow (cfs)
Sediment
Flow
Year
85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02

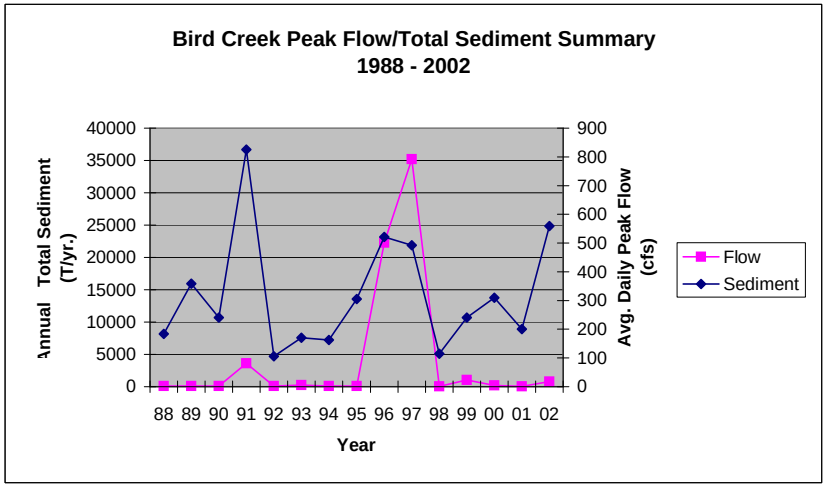

Long Canyon Total Sediment/Flow Summary
1985 - 2002
Annual Total Sediment (T/yr.)
Avg. Daily Peak Flow (cfs)
Sediment
Flow
Year
85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02

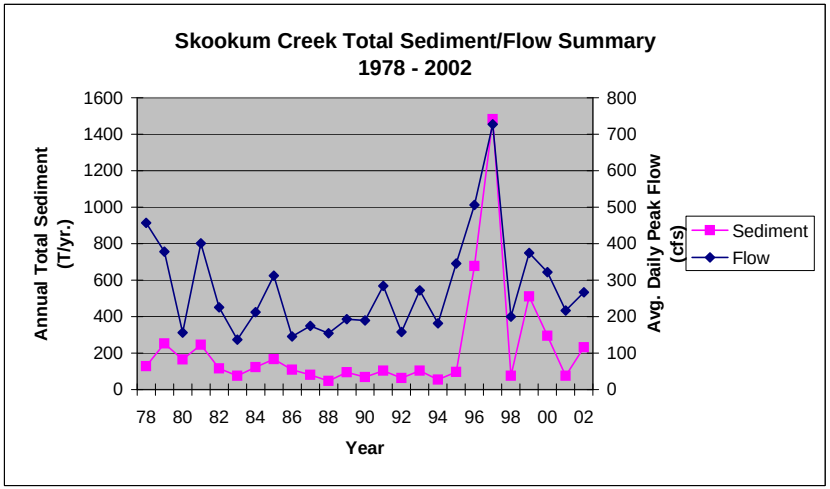

Boulder Creek Total Sediment/Flow Summary
1989 - 2002
Annual Total Sediment (T/yr.)
Avg. Daily Peak Flow (cfs)
Sediment
Flow
Year
89 90 91 92 93 94 95 96 97 98 99 00 01 02


North Fork Grouse Creek Total Sediment/Flow Summary
1985 - 2002
Annual Total Sediment (T/yr.)
Avg. Daily Peak Flow (cfs)
Sediment
Flow
Year
85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02


Big Elk Creek Total Sediment/Flow Summary
1988 - 2002
Annual Total Sediment (T/yr.)
Avg. Daily Peak Flow (cfs)
Year
Sediment
Flow
900
800
700
600
500
400
300
200
100
0
600
500
400
300
200
100
0
88 89 90 91 92 93 94 95 96 97 98 99 00 01 02


Halsey Creek Total Sediment/Flow Summary
1984 - 2002
Annual Total Sediment (T/yr.)
Avg. Daily Peak Flow (cfs)
Year
Sediment
Flow
400
350
300
250
200
150
100
50
0
160
140
120
100
80
60
40
20
0
84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02


Bird Creek Peak Flow/Total Sediment Summary
1988 - 2002
Annual Total Sediment (T/yr.)
Avg. Daily Peak Flow (cfs)
Year
Flow
Sediment
40000
35000
30000
25000
20000
15000
10000
5000
0
900
800
700
600
500
400
300
200
100
0
88 89 90 91 92 93 94 95 96 97 98 99 00 01 02


Skookum Creek Total Sediment/Flow Summary
1978 - 2002
Annual Total Sediment (T/yr.)
Avg. Daily Peak Flow (cfs)
Year
Sediment
Flow
1600
1400
1200
1000
800
600
400
200
0
800
700
600
500
400
300
200
100
0
78 80 82 84 86 88 90 92 94 96 98 00 02

Best Management Practices (BMP) monitoring, which cover effectiveness monitoring of activities during 2002 of practices that took place earlier or during 2002. All of the projects listed in Table 13 are brief summaries. Detailed reports are listed in appendix D on page 97.

Table 13. Best Management Practices Monitoring (next page)

Project Location	Summary of Activities	Summary of Findings
Central Zone Brett Creek Riparian Road	**Effectiveness:** To determine if stream crossing removal was effective in reducing downstream sediment.	Restoration occurred in 2000. All 6 channel sites looked completely stable and functioning properly. Stream banks in all of the crossings were very stable. All gradient control devices remained intact and functioning properly. Vegetation is well established in most areas and regeneration of large, woody debris is occurring naturally.
Central Zone Black Canyon Road 6308A	**Effectiveness:** To determine if stream crossing removal was effective in reducing downstream sediment.	Restoration occurred in 1997. 4 out of 9 sites were monitored. Sites 1 and 2 were found to be stable, while Site 3 had channel sloughing from channel encroachment. Stream banks should have been pulled back further to allow for a wider floodplain. Site 4 also had sloughing due to the steep grade and channel scouring. Head cutting had also occurred, but at a minimum.
Central Zone East Fork Big Creek Road	**Effectiveness:** To determine if stream crossing removal was effective in reducing downstream sediment.	Before restoration in 1997, riparian road was providing large amounts of sediment into the stream due to head cutting and mass wasting of sections of road prism. Woody debris was flown to problem sites and placed on slopes by excavator. All restoration activities provided stability and reduced sediment transport into the stream. There was evidence of heavy ATV usage on first half of road causing minor erosion.
Central Zone Sunny Horizon Rehabilitation	**Implementation:** Public works contract initiated restoration work on approximately 20 miles of 14 different roads.	A total of 53 channel crossings were removed. Full obliteration was not required for watershed improvement. Less than 1 mile of road was recontoured, while over 16 miles of road had 142 water bars constructed. All channel sites were restored to their natural function. A culvert was upgraded to meet INFISH requirements. All excavated areas were seeded with native mix and fertilized.

Project Location	Summary of Activities	Summary of Findings
Central Zone Fernan Heli Rehabilitation Project	**Implementation:** Public works contract initiated restoration work on approximately 8 miles of 8 different roads.	30 water bars were constructed on one road. 12 stream crossings were restored to their natural function on all roads. 5 roads were closed with a 200-foot front-end obliteration. A culvert and arch pipe was upgraded to meet INFISH requirements. A riprap outfall apron was installed at arch pipe 3 rolling dips were added to a road to provide relief from rilling. All excavated areas were seeded with native seed mix and fertilized.
Central Zone Cherry Bug Rehabilitation Project	**Implementation:** Public works contract initiated restoration work on over 10 miles of 9 different roads.	15 stream crossings were restored to their natural function. 58 water bars were constructed on 4 roads worked. Over 5 miles of road was recontoured except Road 1526D, which will remain open. All excavated areas were seeded with native seed mix and fertilized.
Central Zone West Fork Steamboat Creek Rehabilitation Project	**Implementation:** Public works contract initiated restoration work on over 10 miles of 2 roads.	20 stream crossings were restored to their natural function. 55 water bars were installed. Both roads had front-end obliteration for road closures. All excavated areas were seeded with native seed mix and fertilized.
Central Zone BRC Rehabilitation Project	**Implementation:** Public works contract initiated restoration work on over 12 miles of 7 roads.	18 stream crossings were removed, over a mile of road was recontoured, while the other roads had 15 water bars constructed across the running surface. 3 of the 7 roads had front-end obliteration for road closures. All sites were restored to their natural function and all excavated areas were seeded with native seed mix and fertilized.
South Zone Moss Creek Rehabilitation Project	**Effectiveness:** Rehabilitation took place subsequent to the railroad crossing failure in 1996. Instream structures included log steps to create pools, impede sediment transport, and reestablish channel substrate. Site was planted with native seed and debris fan was mulched and planted with willows and conifers.	South Zone hydrologists John Macy and Piper Goessel evaluated site in fall of 2002. Instream structures were intact and functioning, grasses were established on debris fan and banks. Willows and conifers that were planted on debris fan were less than vigorous.

Project Location	Summary of Activities	Summary of Findings
South Zone Eagle-Bird Project Road Obliteration and Culvert Removal	**Effectiveness:** Approximately 50 miles of roads and associated stream crossings were obliterated and restored in 2000 and 2001.	Stream channels at 14 of 21 culvert removal sites appeared to be stable, with natural channel slopes and revegetation. 7 sites appeared to be less stable due to bank erosion or gullying and/or rilling. At these sites revegetation was not as successful and high spring runoff probably eroded the less stable banks.
South Zone North Fork Project Culvert Removal	**Effectiveness:** Road segments not needed for upcoming North Fork vegetation management (Rye on Ham and Mossy Cliff Timber Sales) were partially obliterated in fall 2001.	Stream channels at 9 of 10 removal sites, with natural channel slopes and revegetation. One site had approximately 5 yd^3 of bank erosion probably due to high spring runoff before vegetation was established.
South Zone Beetlemania Salvage Sale Culvert Removal	**Effectiveness:** Roads in the 388X system were obliterated or put into storage in 1999.	Stream channels at 3 of 3 sites were stable, with natural channel slopes and revegetation. Gradient control structures were effective.
South Zone Black Gold Restoration Project Culvert Removal	**Effectiveness:** Roads in the East Fork Gold Creek drainage were obliterated or put into storage in 1996.	Stream channels at 3 of 3 sites monitored were stable, with natural channel slopes and revegetation. Gradient control structures were effective.
South Zone Bird Creek Bridge Replacement	**Effectiveness:** Temporary bridge was replaced with a permanent buttressed concrete bridge in 2001.	Minor widening of the channel occurred since installation of riprap. Grass was growing in seeded and mulched areas. Ditch drainage and sediment structures appeared to be functioning as intended.
South Zone Turner Creek Dam Removal and Channel Restoration	**Effectiveness:** Concrete water-supply dam and accumulated sediment was removed and channel restored in 2001.	Channel structures and banks withstood the high spring runoff. Channel appears to be stable.
South Zone Heller Creek Channel Restoration	**Implementation:** clearing and mining activities precluded large wood recruitment. Placement of large wood occurred in the Heller Creek channel.	20 sites were modified by addition of boulders and/or large wood and/or excavation to create steps, pools, meanders, and fish cover and resting structures: completed as specified.
South Zone Avery Hill Timber Sale BMP Monitoring	**Implementation and Effectiveness**: Three units were tractor logged in 1999-2001 and site preparation/fuels treatment occurred in spring 2002.	Skid trails had ≥100-foot spacing and were water barred and revegetated. LOD retention was sufficient. Riparian buffers were maintained. The soil surface organic horizon was maintained in >98% of burned areas. Natural shrub regeneration was occurring and tree planting had been accomplished prior to monitoring.

Project Location	Summary of Activities	Summary of Findings
South Zone Beetlemania Timber Sale BMP Monitoring	**Implementation and Effectiveness**: Eight (2 tractor-logged) units were harvested in 1998 and site preparation/fuels treatment occurred in fall 1999. 2 miles of temporary road were constructed and obliterated.	Skid trails in tractor-logged units had ≥100-foot spacing and were water barred and revegetated. LOD retention was sufficient. Harvest units were designed to maintain riparian buffers. The soil surface organic horizon was maintained in >98% of the burned areas. Natural shrub regeneration was occurring and tree planting had been accomplished prior to monitoring.
South Zone Lower Marble Timber Sale BMP Monitoring	**Implementation and Effectiveness**: Eight (5 tractor-logged) units were harvested in 2001. One-quarter mile of temporary road was constructed and recontoured.	Five units were in good condition; sufficient LOD retention, riparian buffers maintained, bare soil minimal, regeneration in progress. However, two tractor portions had displaced, compacted and bare soil on skid trails. One (temporary) road continued past a unit and encroached on a perennial stream, displacing soil, contributing fine sediment and excluding riparian vegetation. This road is designated to be closed, so follow-up monitoring is needed.
South Zone Lil Sunshine Timber Sale BMP Monitoring	**Effectiveness:** Five tractor-logged units were harvested in 1997.	Erosion control structures (water bars) on skid trails were in working order and were effective.
South Zone Blue Grouse Timber Sale BMP Monitoring	**Implementation and Effectiveness:** Twelve units were harvested in 1993-2000.	All units were in good condition; sufficient LOD retention, riparian buffers maintained, no bare soil, regeneration in progress.
South Zone Easy Gold Timber Sale Soils Impacts Monitoring	**Effectiveness/Validation**: Four units harvested in 1989 in the East Fork of Gold Creek drainage were monitored for soil impacts.	These units were red-flagged by the IPNF soil impacts spreadsheet model. Soils impacts were found to be ≤12% in one unit and near zero in three units. LOD retention was sufficient.
South Zone River face below Eagle	**Implementation:** Nine units on southerly aspects were	Fire was low intensity; burned only portions of units,

Creek Wildlife/Scrubland Burns	burned using a helitorch in the spring of 2002.	fire did not affect riparian areas and did not enter riparian areas; some areas of unburned brush remained. One unit burned down into the Wild and Scenic river corridor. However, impacts were minimal and almost undetectable by the end of the growing season.

Forest Plan Monitoring Item G-4: Fish Population Trends

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

- Provide for diversity of plant and animal communities.
- Manage the habitat of animal and plant species listed under the Endangered Species Act to provide for recovery as outlined in species recovery or management plans. Manage habitat to maintain population of identified sensitive species of animals and plants.
- Manage fisheries habitat to provide a carrying capacity that will allow an increase in the Forest's trout population.

In conjunction with Idaho Department of Fish and Game (IDFG), we conduct annual surveys of a subset of streams on the IPNF. The primary focus of these surveys has been westslope cutthroat trout (*Oncorhynchus clarki lewisi*) and bull trout (*Salvelinus confluentus).* Some of these surveys are only conducted once, while others have been surveyed multiple years in the same location. Surveys for bull trout have been focused in the Priest, Pend Oreille, and St. Joe basins. Extensive surveys for cutthroat trout have been conducted in the Coeur d'Alene basin. In addition, surveys for torrent sculpin, a Region 1 sensitive species, were undertaken in the Coeur d'Alene basin, Priest, Pend Oreille, and Kootenai basins in 2002. Sampling will continue in 2003 and will be expanded to include streams in the St. Joe basin.

Current Status of Bull Trout and Westslope Cutthroat Trout

Bull trout were listed on June 10, 1998 as Threatened under the Endangered Species Act (ESA). Westslope cutthroat trout are listed as "sensitive" by Region 1 of the USDA Forest Service and are listed as "species of special concern" by the State of Idaho. The USFWS lists westslope cutthroat trout as a "Species of Concern" with respect to section 7(c) of ESA. The USFWS found that listing the westslope cutthroat trout was not warranted on April 14, 2000; however, a status review is currently underway.

General Population Trends

Based on current information, bull trout and westslope cutthroat trout populations appear to be stable throughout most of north Idaho. Redd count data in the Pend Oreille basin show that bull trout populations are stable and may be increasing, while populations in the Priest basin appear to be declining, and populations in the St. Joe basin appear mixed.

Population Information and Trend by Ranger District

Coeur d'Alene River Ranger District

This report will address fish population data that we have not reported on in the past or we have additional information on trends. We will be evaluating fish population trends within the tributary streams and within the main river systems. No data on lake populations or trends was evaluated.

Tributary streams

Salmonids

The tributary areas and headwaters of our river systems are generally utilized as spawning and rearing areas by fluvial and adfluvial fish, but can also have populations of resident fish. Preliminary results from samples collected within two tributary streams in the Little North Fork of the Coeur d'Alene River indicated differences among streams that maybe large (Rieman and Horan, 2000). All the samples analyzed from Lavin Creek appeared to be of migratory origin, while all samples from Iron Creek appear to be resident. Because these streams are in close proximity to each other it was expected that they would show similar patterns. Without extensive characterization of each watershed or broad ecological areas we must assume both migratory and resident populations exists.

We will be discussing information from three main data sources in this section of the report. Two Masters theses that were completed within the Coeur d'Alene river basin will be used, J.L. Dunnigan (1997) and A.M. Abbott (2000). We will also be discussing data collected by the U.S. Forest Service. This data was collected while monitoring individual projects and during the continued monitoring of Dunnigan and Abbotts' work. The studies identified westslope cutthroat trout, rainbow trout (*Oncorhynchus mykiss*), hybrids of cutthroat and rainbow and brook trout (*Salvelinus fontinalis*). No bull trout were found during any of the work.

Dunnigan and Abbott evaluated 63 to 73 individual streams within the basin. These streams were sampled during three consecutive years (1994, 1995 and 1996). It is estimated that, with these two studies, over 540 miles of stream were electrofished. Watersheds were subsampled within each 6th Hydrological unit code (HUC) (except Prichard and Beaver Creeks) within the North Fork of the Coeur d'Alene basin (HUC# 17010301) (Figure 6).

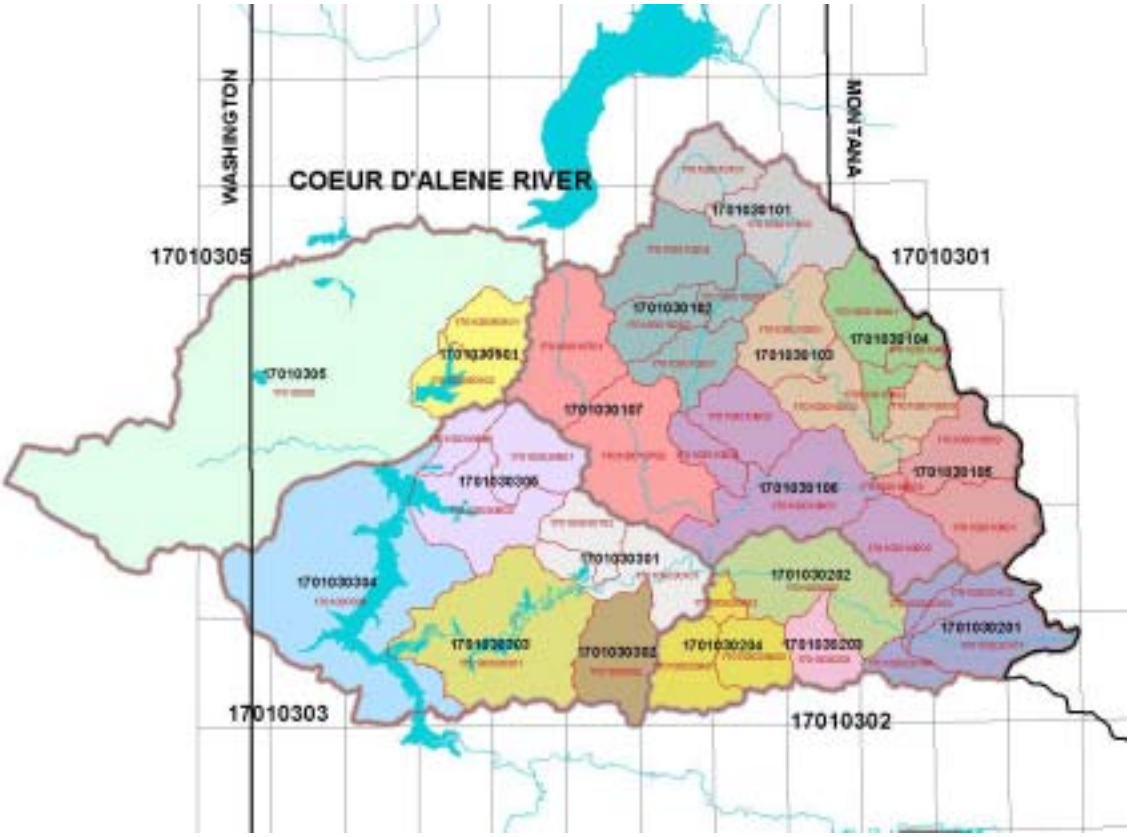


Figure 6. Fifth Code watersheds (black numbers within colored areas) within the Coeur d'Alene basin, Idaho.

Although these studies only cover a period of three years, they provide some valuable information when one begins to interpret trend information. The two studies found significant differences in cutthroat abundance between years and between major basins. Dunnigan predicted densities ranging from 0.003 to 0.606 cutthroat/m^2 and Abbott's densities ranged from 0.001 to 0.358 cutthroat/m^2 . Both studies found the highest densities in the main Coeur d'Alene River (1701030103 and 1701030101) and the lowest densities in the Little North Fork Coeur d'Alene River (1701030107; studies refer to this watershed as the North Fork). The data showed a significant reduction in populations from 1995 to 1996. During the winter of 1995 the basin experienced the second highest flow of record. Over the three years of study the authors felt that the flood of '95 had a significant negative effect on populations within the Coeur d'Alene basin. Both studies found that cutthroat trout were able to persist following significant disturbances, including those due to land management activities, to severe flooding, and the cumulative effects of both, albeit at very low densities. Dunnigan also looked at variation in populations based on stream reaches (i.e., upper and lower sections of a basin). He found that densities were consistently higher in the upper reaches than the lower reach. In fact the highest densities were found in the upper reaches of tributary streams in the Upper Coeur d'Alene basin (1701030101). Although Abbott found a significant reduction in the densities of cutthroat in these watersheds from 1995 to 1996, she felt that the lack of channel complexity (e.g., large wood) may have played a role in this decline. Dunnigan

also look at seasonal variation (early summer – early fall) in cutthroat densities within eleven streams in the basin. His research indicated that densities can change based on the season, indicating population estimates are affected by the season that samples were taken. One could hypothesize from the seasonal data that fish are moving within these tributary streams seeking environmental conditions that favor growth and survival. This data indicates one must be cognizant of connectivity of all life stages of salmonid populations when evaluating movement.

Both studies attempted to identify variables that would predict cutthroat densities within streams. Dunnigan found some weak associations with densities and percent pools and road densities. He found where road densities were high, pool frequencies were low and low densities of cutthroat were predicted, although he indicated that, because of variability in the habitat data (i.e., it was collected a number of years before his study), the relationships were not strong. Abbott, on the other hand, showed that cutthroat trout densities increased with wetted width, increased with large woody debris counts, and decreased with increased cumulative equivalent clearcut acreage. Abbott found that cutthroat trout densities are better predicted by variables measured at the stream or watershed level than at the site or habitat level.

Data collected by the US Forest Service was composed of both electrofishing and snorkeling transects. From 1998 to 2002 we collected data in 14 watersheds. The samples were taken in conjunction with other monitoring data and only the lower reaches of each watershed were sampled. Our data showed cutthroat densities ranging from 0.01 to 0.79 fish/m^2. All but one sample (watershed) had cutthroat densities that ranged from 0.01 to 0.19 fish/ m^2 which are within the densities found by both Abbott and Dunnigan. The single outlier was Halsey creek, which was sampled in early October. Densities were about 10 times greater than those found by Abbott. Her data was an average of 9 transects, while ours only represents a single site. Based on information presented above from Dunnigan's work, it is likely our information is not representative of the watershed. To be able to compare watersheds through time and space it is necessary to adopt a sampling regime that will provide a constant methodology. One possibility is to adopt the techniques utilized by Dunnigan and Abbott where electrofishing is appropriate within the Coeur d'Alene basin. In order to accomplish this, monitoring plans (i.e., streams and frequency) must be identified in advance and appropriate funding must be available to conduct the monitoring.

The US Forest Service has been collecting information on a single stream (Jordan Creek) in the headwaters of the Coeur d'Alene River for the past 10 years (Figure 7). This work was associated with a stream improvement project, but provides the only long-term tributary monitoring data in the basin. Cutthroat densities were similar to those found in the more extensive work conducted by Abbott in 1996 (0.02-0.06 cutthroat/ m^2), but were much lower than those found by Dunnigan in 1995 (0.12-0.53 cutthroat/ m^2). Our data also exhibits a decline in densities after the high water of 1995, although the lowest densities were found in 1997 and 1998, three years after the event. We believe that habitat variability, cover, and stream types could help explain some of the variation,. We have limited trend data on the basin to determine if other streams exhibited a similar

decline (Figure 8). From this graphic three of the four streams exhibited an increase in cutthroat densities.

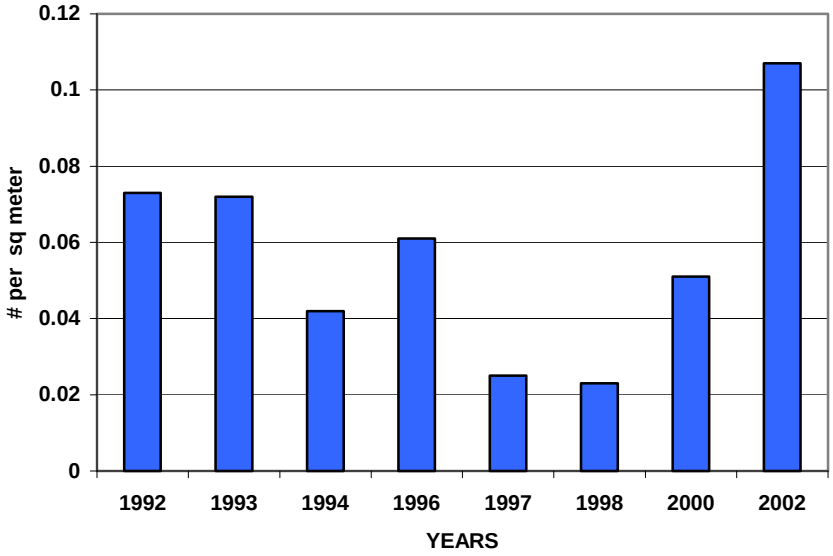


Figure 7. Average densities of cutthroat trout from eight transects in the Jordan Creek watershed 1992 through 2002, Coeur d'Alene river Idaho.

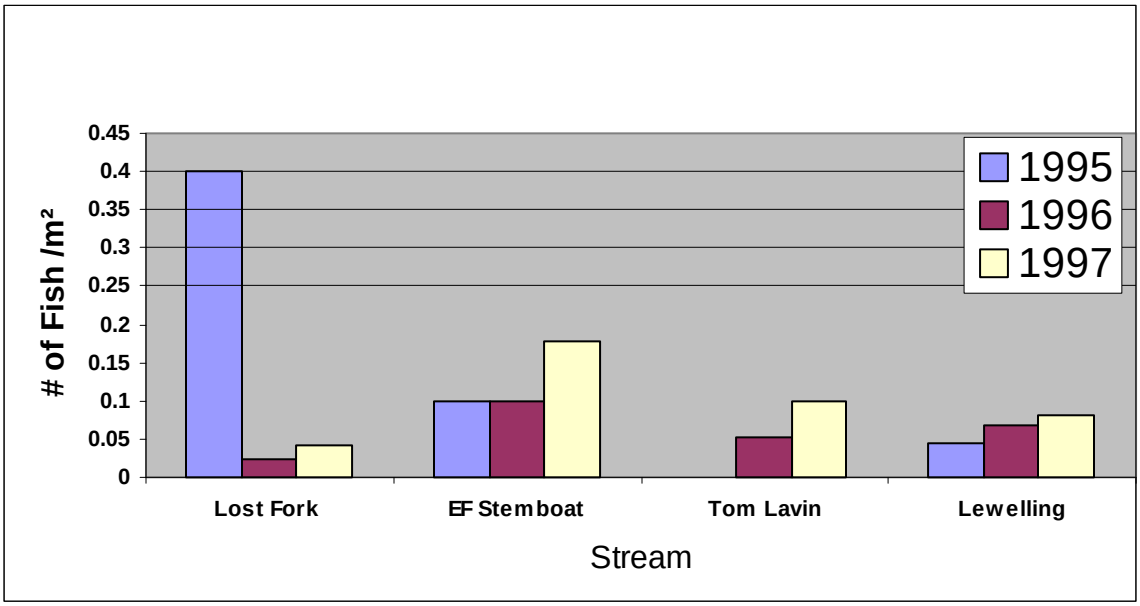


Figure 8. Average fish densities for four streams during three years in the Coeur d'Alene River Basin, Idaho

Sculpin and Dace

Some work has been conducted on other native freshwater fish within the Basin. Two species of sculpin (shorthead, *Cottus confusus,* and torrent, *Cottus rhotheus*) are known to occur and a single species of dace (longnose, *Rhinichthys cataractae*). Most data collected to date have not identified sculpin to the species level. This has been identified as a concern. As a result, the Idaho Panhandle National Forests initiated a study on the forest to look at the distribution and abundance of torrent sculpin, a species on the Regional Forester's Sensitive Species list. Although this study focuses on a single species, the researcher will be identifying all sculpin to species, and obtaining information by species. The training on sculpin species identification has also provided a valuable opportunity for other fisheries biologists on the forest to learn to identify sculpin species.

We collected preliminary information on the abundance of sculpin in some of our tributary streams in 2000 and 2002. The data is limited and, due to low efficiency of capturing sculpin, confidence intervals on population estimates are quite large. Our data does indicate that sculpin are somewhat numerous in all streams we have sampled. Density estimates ranged from 44 to 369 fish/ m^2.

Preliminary data collected in the torrent sculpin research indicates that they are present throughout the Coeur d'Alene basin, but are limited to the larger, low-gradient streams and rivers. Analysis is currently being conducted on density estimates and to determine if densities can be predicted by variables measured at the stream or watershed level. Research in the St Joe River, Priest River, Kootenai River and Pend Oreille Lake basins will be conducted during the 2003 field season.

Distribution and density estimates of dace are limited. Based on limited field observation their distribution appears to be similar to that of torrent sculpin. They are generally found in the larger, low-gradient streams and rivers.

Main Rivers and Large Streams

Main rivers and large streams provide our main recreational fishing opportunities within the Coeur d'Alene River Basin. Monitoring of these areas has been conducted by the Idaho Department of Fish and Game over the past 30 years. The Forest Service started monitoring in some of the larger systems such as Independence Creek in 2000. The purpose of this monitoring is to evaluate the effects of limited access and low levels of forest management (i.e., a reference watershed) on fish populations.

The following information and figures were taken from the Draft 2001 Annual Performance Report (DuPont and Horner, Idaho Department of Fish and Game). The following are quotes from the report:

- "In 2001 cutthroat trout were most abundant in the North Fork Coeur d'Alene in the catch and release area upstream of Yellow Dog Creek". This is the same

section of the Coeur d'Alene River basin that Dunnigan and Abbott found the highest abundance of cutthroat in the tributary streams (see discussion above).

- "A strong increasing trend in cutthroat trout density is apparent in the Coeur d'Alene River despite the decline following the 1996 flood event (Figure 9). In fact, the overall density of cutthroat trout in the Coeur d'Alene River in 2001 was the highest ever recorded. However, if only cutthroat trout greater than 300 mm are evaluated in the Coeur d'Alene River, no apparent increase in density has occurred over time (Figure 10). The low densities of cutthroat trout greater than 300 mm observed in the Coeur d'Alene River is perplexing, as the abundance of fish less than 300 mm has been increasing over the years. Several theories are available to why this condition occurs: 1) Habitat for juvenile trout (tributary habitat) is improving whereas habitat important for larger cutthroat trout (deep, slow velocity pools) is not; 2) Improving habitat conditions in the system could account for the increase in abundance of juvenile fish (< 300 mm), whereas high incidental mortality and poaching is cropping off the larger fish; 3) As cutthroat trout in the Coeur d'Alene River increase in size, they move downstream or upstream to areas where snorkel transects are not located; 4) A large proportion of this cutthroat trout population is made up of adfluvial fish – the larger fish would therefore have migrated down to the lake by the time the snorkeling was conducted; and 5) Some combination of above."

The U.S. Forest Service and the Idaho Department of Fish and Game have initiated a research study that will look at the life history strategy, movement, and habitat use of large cutthroat trout in the Coeur d'Alene River. We feel that this study will help us address some of the theories that were discussed above as to why cutthroat trout over 300 mm are not increasing.

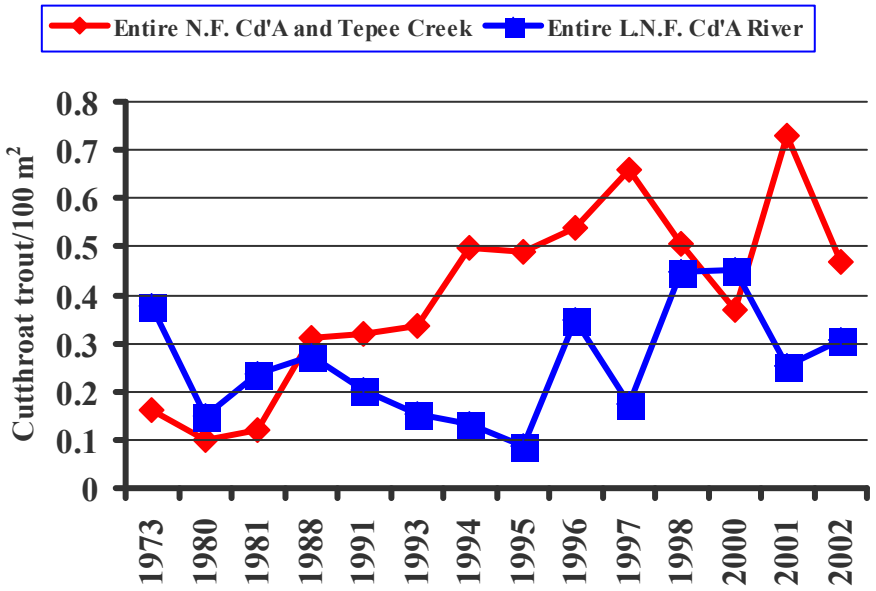
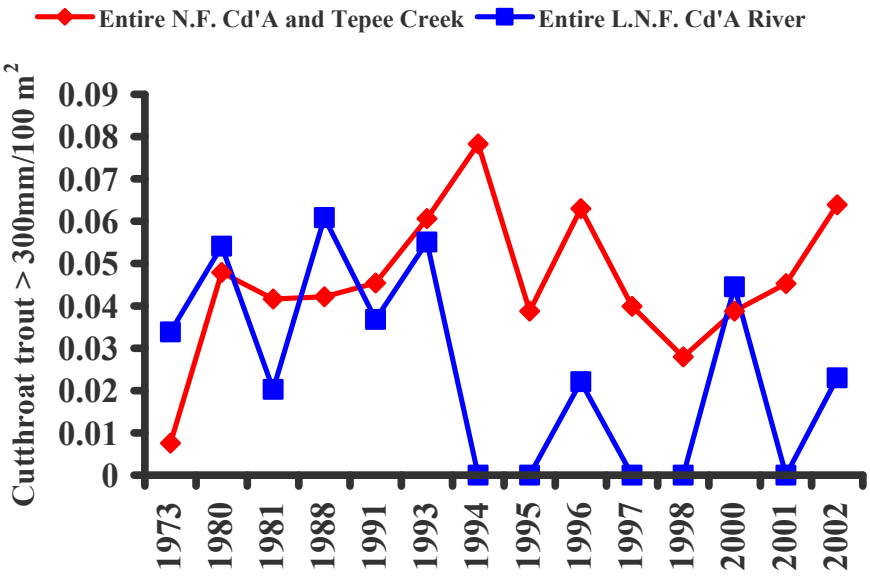


Figure 9. The average density of cutthroat trout observed while snorkeling the North Fork Coeur d'Alene River (N.F. Cd'A) and Little North Fork Coeur d'Alene River



(L.N.F. Cd'A), Idaho, between 1973 and 2002. (Data from Draft 2001 Annual Performance Report, Idaho Department of Fish and Game.)

Figure 10. The average density of cutthroat trout > 300 mm observed while snorkeling the North Fork Coeur d'Alene River (N.F. Cd'A) and Little North Fork Coeur d'Alene River (L.N.F. Cd'A), Idaho, between 1973 and 2002. (Data from Draft 2001 Annual Performance Report, Idaho Department of Fish and Game)

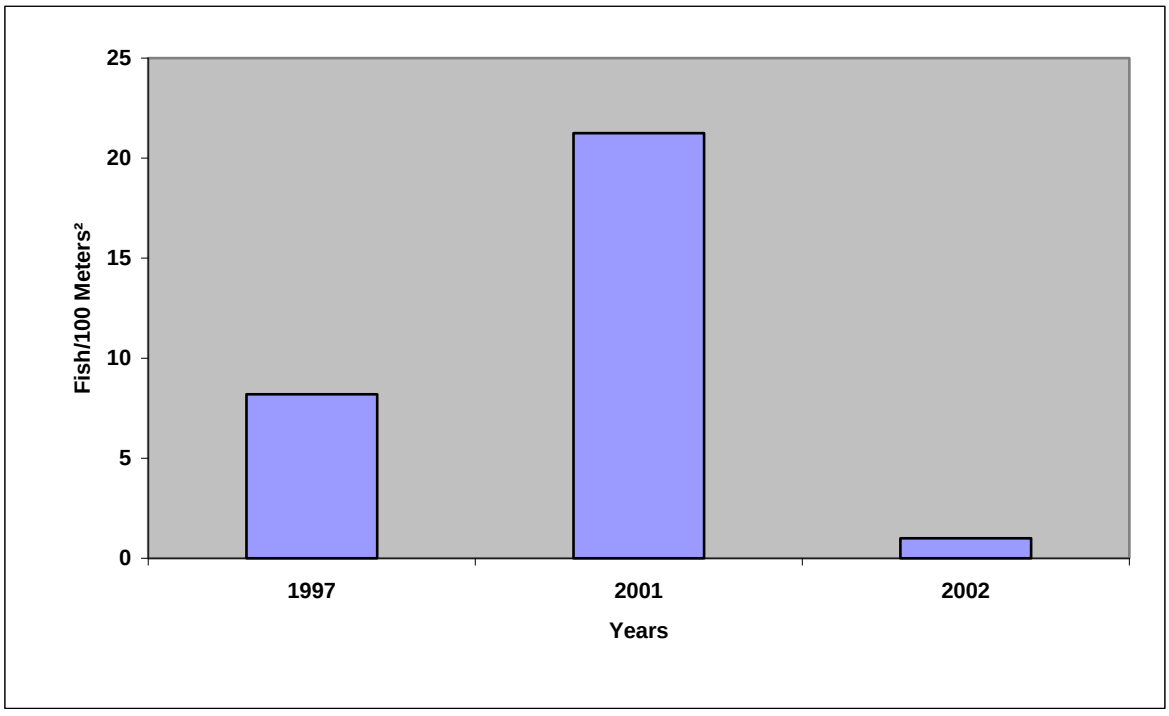


Figure 11. Snorkel data from the Little North Fork Coeur d'Alene River. Data shows the average of four transects for the area from Hudlow to Lewelling creek, 1997 –2002.

The U.S. Forest Service monitored four sites in the upper Little North Fork Coeur d'Alene River from 1997 to 2002. These sites did not follow the pattern seen in Figure 8. When sampling was started in 1997 densities were much lower than the average densities found in the Idaho Fish and Game transects. In 2001 densities approximated those reported by IDFG. In 2002 densities were at the lowest level, whereas IDFG showed an increase in densities. All the fish counted in our four transects were smaller fish (i.e., 0+ to 2+ age fish).

North Zone (Sandpoint, Bonners Ferry, and Priest Lake Ranger Districts)

Population Surveys and Monitoring

Population surveys were conducted in many streams within the boundary of the three North Zone ranger districts using a variety of methods over the past two years (Table 14).

Table 14. Total population inventory and monitoring conducted on National Forest System lands within the North Zone by agency.

2001 & 2002	Electrofishing(mi)	Snorkeling (mi)	Redd surveys (mi)
USFS	1.30	2.86	7
IDFG	1.25	5.8	78
IDL	0	0	0

Bull Trout Population Trends

IDFG has been conducting redd counts in tributaries of the Pend Oreille since 1983 and in tributaries in the Priest basin since 1985. Many streams have been surveyed annually. While redd count data has many sources of variability (Rieman and McIntyre 1997) and is prone to sampling error (Dunham et al. 2001), the overall data seems to indicate that, in general, bull trout populations are declining in the Priest Lake basin, but are stable and may be increasing in the Pend Oreille basin. There is less information on bull trout population trends in the Kootenai River basin; however, redd surveys in Boulder Creek during 2000, 2001, and 2002 show counts of 0, 4, and 2, respectively with sightings of 2 adults in 2001 and 2 juveniles per season (Jody Walters, IDFG, personal communication, 03/10/2003). Based on various sampling methods by both the USFS and IDFG over the past two decades, bull trout populations in the Kootenai River basin in Idaho are very low.

St. Joe Ranger District

Fish Assemblage Surveys

The St. Joe Ranger District conducted fish assemblage surveys using electrofishing and snorkel techniques in 2001 and 2002 (Table 15). The primary reason for selection of streams surveyed was to provide baseline information for environmental assessment documents. In 2001, the snorkel surveys were an exception to this objective. These snorkel surveys were conducted to monitor previously installed structures. The exception to the primary objective in 2002 was the selection of streams in the upper St. Joe area. This area was chosen because of the need to determine if bull trout were utilizing smaller tributaries in the general vicinity of larger tributaries which bull trout were known to occupy.

Table 15. Surveys of Stream Habitat and Fish Populations on the St. Joe Ranger District

Activity	Year	Methodology	Units	Accomplished
Fish Habitat survey	2001	R1/R4	Miles	31.7
	2002			20.1
Presence/Absence Survey	2001	Electrofishing	Streams	10
	2002			24
Presence/Absence Survey	2001	Snorkeling	Streams	3
	2002			7
Bull Trout Redd Survey	2001	Ocular	Miles	28
	2002			36

Fish assemblage surveys were conducted throughout the St. Joe District, including streams, which are tributary to the St. Maries River, and streams near the headwaters of the St. Joe. Westslope cutthroat trout were the most widely distributed species. They were found in almost all streams, which were utilized by fish (Table 16). The exceptions were two streams in the upper St. Joe area. Bull trout were located in these two streams so the survey was immediately curtailed before a complete survey could be conducted. Brook trout and dace were only located in the tributaries to the St. Maries River. Nighttime snorkeling was conducted in the East Fork of Emerald Creek, as requested by the US Fish and Wildlife Service Biological Opinion for the Emerald Garnet Dig BA, 1999. The survey was conducted on 2 separate nights. No bull trout were identified.

Table 16. Distribution of Fish Species

			Number of Streams					
Method	**Year**	**Total # of streams**	**Bull Trout**	**Westslope Cutthroat Trout**	**Sculpin spp.**	**Brook Trout**	**Dace**	**No fish**
Electrofishing	2001	10	1	10	7	2	1	0
	2002	24	3	18	13	1	0	4
Snorkel	2001	3	0	3	0			0
	2002	7	0	6	4	0	0	1

The 2002 surveys can be divided into three general locations: East Fork Emerald Creek area, upper Marble Creek area, and upper St. Joe area. When reviewing westslope

cutthroat trout densities within streams that range in size from 1-2 meters, the streams of the East Fork Emerald Creek area had much lower densities, average 0.0035 Catch per Unit Effort (CPUE) than those of the other two areas, average 0.018 and 0.020 CPUE, respectively (Table 17).

Table 17. Westslope Cutthroat Trout Densities in streams ranging in size 1-2 m

Area	**Stream name**	*CPUE*
East Fork Emerald	Swamp Creek	0.001
	Flat Creek	0.004
	Post Creek	0.004
	Highline Creek	0.005
	Average	**0.003**
Upper Marble Creek	Cranberry Creek	0.011
	Toles Creek	0.013
	Shearer Creek	0.030
	Average	**0.018**
Upper St. Joe	Ascent Creek	0.002
	Cascade Creek	0.010
	Scat Creek	0.020
	Color Creek	0.032
	Game Creek	0.034
	Average	**0.020**

Bull Trout Redd Surveys

Bull trout redd surveys have been conducted in the St. Joe River drainage since 1992. The U.S. Forest Service and representatives from various organizations including Idaho Fish and Game, Panhandle Chapter of Trout Unlimited, University of Idaho, AVISTA (formerly Washington Water Power), and other volunteers have cooperated to monitor bull trout spawning activity in selected streams and reaches in the Upper St. Joe River. Cooperating agencies and volunteers are required to walk selected streams to visually identify adult bull trout, spawning activity, and definite/possible redds. Information collected during surveys in each stream or reach includes number and location of adult fish and redds, stream temperature, and stream distance surveyed.

In 2001, twenty-eight stream miles were surveyed in Beaver Creek, California Creek, Medicine Creek, Red Ives Creek, Simmons Creek, Upper St. Joe River, Wisdom Creek, and Yankee Bar (Table 18). In 2002, thirty-six stream miles were surveyed in Aspen Creek, Beaver Creek, California Creek, Copper Creek, Entente Creek, Fly Creek, Gold Creek, Heller Creek, Medicine Creek, Quartz Creek, Red Ives Creek, Upper St. Joe River, Wisdom Creek, and Yankee Bar (Table 18).

Table 18. Number of streams and stream miles accomplished for bull trout redd surveys in the St. Joe River Drainage by the USFS and cooperators, 1993-2002.

	Year										
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
No. Streams	15	23	23	21	8	16	10	11	7	8	14
Stream Miles	~	46	51	40	11	31	20	23	12	28	36

Documented bull trout spawning activity has been variable among the forty-two streams and reaches surveyed since 1992. This variability may be more dependent upon environmental conditions and observer bias rather than a reflection of overall bull trout abundance. Surveys are conducted on the third weekend of September each year. Annual precipitation, stream flow, and temperature regimes likely influence bull trout migration, access, and spawning periods. Of the eight streams that have been consistently surveyed since 1992 (Beaver, California, Fly, Heller, Medicine, Red Ives, Sherlock, and Wisdom Creeks), relative density of bull trout redds (number of redds per mile) has increased slightly or has remained relatively stable in Fly, Medicine, Sherlock, and Wisdom Creeks. Additional survey years will be necessary to accurately determine bull trout spawning population trends and relative abundance.

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

Forest Plan direction for sensitive and rare species, including plants, is 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 November of 2001, the USFWS listed the plant *Silene spaldingii* (Spalding's catchfly) as threatened. This long-lived perennial forb species is known from 52 sites in west-central Idaho, northwestern Montana, adjacent British Columbia, northeastern Oregon, and eastern Washington. In eastern Washington, this species is known from 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 field surveys have been conducted from 2000 to 2002 to validate predicted habitat and search for populations. Potential habitat identified in proposed project areas is surveyed prior to implementation. No populations of Spalding's catchfly have been found to date on the Idaho Panhandle.

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 (FSOC) 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 as for sensitive plants, any viability concerns are addressed in environmental documents. More information on the species on the ICDC lists can be found on the Internet at http://www2.state.id.us/fishgame/info/cdc/cdc.htm.

Monitoring Data

Surveys: During project planning, qualified botanists assess habitats for their suitability to support sensitive and rare plants. Habitat found to be suitable within project areas, and which would be affected by project-related activities, 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 2002, Forest botany personnel and contractors performed on-the-ground clearance surveys on 6,773 acres of high potential habitats for TES and rare plants in support of various projects including timber, watershed, fisheries, KV, trails, grazing, special uses, 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.

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 5,000 acres. Prior to 1988, the Forest Service did not conduct surveys and rare plant observations reported to the ICDC were incidental. From 1994 to 2002, surveys occurred on 72,531 acres of federal lands with the express purpose of documenting and protecting rare plant populations from management activities and mitigating potential adverse effects. In 2002, 6,773 acres were surveyed for sensitive and rare plants, a slight increase from 2001. Recent estimates of sensitive plant habitat have determined that approximately 705,000 acres (~28%) of the total land base of the IPNF has the potential to support sensitive plant species in a wide array of plant communities. To date, about 10 percent of all suitable sensitive plant habitat has 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 2002), 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 five northern counties, on 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 821 occurrences, of 80 rare species, mostly on federal lands. In 2002, there were 27 element occurrences reported for the five northern counties.

There were several notable discoveries of rare plants on the Forest in 2002 by IPNF personnel and others. The discoveries included twenty-four different sensitive plant species and one other rare plant species. The new rare plant occurrences are displayed in table 19 below.

Table 19. New Rare Plant Occurrences, 2002*

Species	Common name	Status	Number of Occurrences
Betula pumila	dwarf birch	sensitive	1
Blechnum spicant	deerfern	sensitive	3
Botrychium montanum	western goblin	sensitive	2
Botrychim simplex	least moonwort	sensitive	1
Buxbaumia viridis	green bug-on-a-stick moss	sensitive	7
Cypripedium fasciculatum	clustered lady's-slipper orchid	sensitive	2
Gaultheria hispidula	creeping snowberry	sensitive	1

Petasites sagittatus	arrowleaf coltsfoot	sensitive	2
Phegopteris connectilis	northern beech fern	sensitive	1
Platanthera orbiculata	round-leaved rein orchid	FSOC	1
Polystichum braunii	Braun's holly fern	sensitive	1
Salix pedicellaris	bog willow	sensitive	2
Tellima grandiflora	fringecup	FSOC**	1
Trientalis arctica	northern starflower	sensitive	1
Waldsteinia idahoensis	Idaho barren strawberry	sensitive	1

*Includes occurrences on IPNF lands only.
** Forest Species of Concern

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 2002, monitoring plots for two sensitive species - Howell's gumweed (*Grindelia howellii*) and clustered lady's slipper (*Cypripedium fasciculatum*)– were sampled.

Howell's gumweed (*Grindelia howellii*) occurs on the St. Joe Ranger District of the IPNF. 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 are shown in Table 20.

Table 20. *Grindelia howellii* summaries, 1995-2002

		Germ/Juvenile	NFADS	FADS	Ave Flowers	Total Plants
Plot 1	1995	221	48	4	9.33	273
	1996	30	99	10	11.5	139
	1997	23	21	8	11.13	152
	1998	21	89	20	10	129
	1999	2	62	31	8.65	95
	2000	2	32	21	6.7	55
	2001	21	22	28	8.3	71
	2002	41	27	14	5.9	83
Plot 2	1995	739	257	74	8.05	1070
	1996	137	276	100	3.53	513
	1997	415	354	33	7.36	802
	1998	189	332	60	7.3	581
	1999	114	214	21	4.29	349
	2000	71	81	4	3.75	156
	2001	22	84	6	8.5	112
	2002	93	49	4	7.75	135
Plot 3	1995	No data	-	-	-	-
	1996	91	166	25	5.76	282
	1997	282	219	22	7.64	523
	1998	Data not usable, errors		-	-	-
	1999	126	306	52	4.04	484
	2000	39	158	22	3.86	219
	2001	99	145	41	5.1	254
	2002	502	70	17	3.58	589

*(Germ = germinant; NFAD = non-flowering adult; FADS = Flowering adult. Average flowers is average flowers per flowering plant)

The population being monitored is being impacted by competing noxious weeds and other factors. Weed treatment and effectiveness monitoring have been conducted annually on the site since 1999. More monitoring data are necessary before conclusions about the effects of the noxious weed treatments on population trends for Howell's gumweed can be determined.

The data for Howell's gumweed 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. The trend from 2001 to 2002 is an increase in total plants on all plots. Plot 1 went from 71 to 83 and Plot 2 went from 112 to 135 and plot 3 increased from 254 to 589. Eight years of monitoring data for the two plots show a cyclical trend, likely a response to the same environmental stimuli: precipitation, snow-pack, etc. Concern for this species remains high and monitoring will continue in 2003. There are a total of 14 Howell's gumweed 'colonies' within a couple square miles of each other, all that is

known in the state. These three plots are representative of the 14 colonies, and likely reflect what is happening to the entire population in the area.

The clustered lady's slipper (*Cypripedium fasciculatum*) plots were established in 2000 on the St. Joe Ranger District in order to determine the effects of timber harvest on population vigor. Two plots were established, each with three transects or subplots. One plot is the control and the other is located in an area to be thinned. Timber harvesting has not yet been implemented; it is planned for 2003. A + denotes that additional seed heads had been grazed off.

Table 21. *Cypripedium fasciculatum* monitoring plots, 2000-2002

	Plot Number	# Flowering	# Non-flowering	# Flowers	# Total Plants
2000 Control	**1**	7	3	19	10
	2	8	12	16	20
	3	14	15	7+	29
Thin (pre-harvest)	**1**	10	22	21	32
	2	15	15	20+	30
	3	4	3	13+	7
2001 Control	**1**	8	1	11	9
	2	8	8	12	16
	3	No data	-	-	-
Thin (pre-harvest)	**1**	8	13	13	21
	2	8	13	13	21
	3	5	1	11	6
2002 Control	**1**	9	1	18	10
	2	9	7	31	16
	3	12	10	35	22
Thin (pre-harvest)	**1**	12	21	19	33
	2	13	13	21	26
	3	4	0	7	4

There are no conclusions from this study yet, as monitoring is ongoing.

Conservation Strategies: In 2002, Forest botany personnel prepared or contracted the preparation of conservation strategies for two sensitive plants, one for deerfern (*Blechnum spicant*) (Merkel and Hammet 2003) and one for clustered lady's-slipper orchid (*Cypripedium fasiculatum*) (Lichthardt 2003). The deerfern conservation strategy was prepared for the Idaho Panhandle and Clearwater National Forests. The clustered lady's slipper conservation strategy was prepared for the Idaho Panhandle and five other Forests in Region 1. Both reports provide current information on the status, distribution, biology, threats, monitoring and management guidelines for the species. The purpose of

conservation strategies is to provide information on sensitive and candidate species to ensure species viability is maintained and to prevent the need for federal listing.

Literature Cited:

Merkel, R. and A.E. Hammet. 2003. Species Conservation and Monitoring Plan for *Blechnum spicant* for Northern Idaho, Idaho Panhandle National Forests, and Clearwater National Forest. USDA Forest Service. Sandpoint Ranger District, Sandpoint, Idaho.

Lichthardt, J. 2003. Conservation Strategy for Clustered lady's-Slipper Orchid (*Cypripedium fasciculatum*) in U.S. Forest Service Region 1. Unpublished report prepared for U.S. Forest Service, Idaho Panhandle National Forests, by Idaho Department of Fish and Game, Conservation Data Center, Boise, Idaho.

ICDC. 2002. Idaho Department of Fish and Game Conservation Data Center. Element occurrence records. Contained in an electronic database. 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 (placer mining) on the central part of the Forest. There is a small amount of exploration for vein deposits of metals (hard rock mining). There is a facilitated garnet digging site on the southern part of the Forest with some saleable/lease activity for commercial garnet production.

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 - 2,213 (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 - 4

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 - 13

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 - 13

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

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

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

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

- Compaction

- Removal of topsoil (displacement)

-Units with insufficient organic matter and coarse woody-debris left on-site

-Areas that have been severely burned

Definitions of what is considered detrimental impacts:

- Detrimental Compaction: More than 20% increase in bulk density over natural for volcanic ash surface soils and the compacted soil must display a massive or platy structure.

- Detrimental Displacement: Removal of the forest floor and one inch or more of the surface mineral soil over a 25 sq. ft. or more area.

- Severely Burned: The soil surface is in a condition where most woody debris and the entire forest floor is consumed down to mineral soil. The soil surface may have turned red due to extreme heat. Also, fine roots and organic matter are consumed or charred in the upper inch of mineral soil.

- Coarse woody-debris recommendations are as follows:

    - Douglas-fir sites need 7 to 13 tons per acre
    - Grand fir sites need 7 to 14 tons per acre
    - Western hemlock/western red-cedar sites need 17 to 33 tons per acre
    - Subalpine fir sites need 10 to 19 tons per acre

- Optimum levels of fine organic matter are 21 to 30 percent in Douglas fir and grand fir habitat types. In subalpine fir, moist western hemlock and western red-cedar habitat types, strong levels of fine organic matter exists at 30 percent or greater (Graham et, al, 1994).

This years monitoring focused on the following three harvest systems:

1) Winter felling and decking with a harvester and summer / fall helicopter log removal was monitored on Unit 71 of the Charlie Flight sale, which occurs on the St. Joe Ranger District.

   Unit 71 on the Charlie Flight timber sale had 4 percent detrimental compaction. Compaction was the only detrimental impact that occurred in this unit. This unit meets Regional and Forest Plan soil quality standards.

   The Charlie Flight Unit also met the fine organic matter guidelines and the coarse woody debris guidelines.

   Unit 71 was in the western red-cedar habitat type and the recommended range of coarse woody debris is 17 to 33 tons per acre and fine organic matter for these habitat types should be 30 percent or greater. Transects on this unit ranged from 37 to 66 tons per acre of coarse woody debris and 33 percent was the average for fine organic matter levels.

2) A cut to length harvester and log forwarder operation on Unit 17 of the Dutch Cat timber sale was monitored at the St. Joe Ranger District.

   Unit 17 on the Dutch Cat timber sale had 12 percent detrimental compaction. Compaction was the only detrimental impact that occurred in this unit. The unit meets Regional and Forest Plan soil quality standards.
   The Dutch Cat Unit also met the fine organic matter guidelines and the coarse woody debris guidelines.

   Unit 17 is in the western red-cedar habitat type and the recommended range of coarse woody debris is 17 to 33 tons per acre and fine organic matter for these habitat types should be 30 percent or greater. Transects in this unit averaged 23 tons per acre for coarse woody debris and 32 percent was the average for fine organic matter levels.

3) A past horse logging operation on Units 1, 6 and 8 of the Dry Wall Project was monitored at the Bonners Ferry Ranger District.

   Units 1, 6 and 8 on the Dry Wall project had an average of 1.5 percent detrimental impacts. These units meet Regional and Forest Plan soil quality standards.

IV. OTHER TOPICS OF INTEREST

The Forest Plan does not require that the information in this section be part of the monitoring report. The information is included because of public interest in these subjects of forest-wide importance. Topics addressed include ecosystem restoration, old growth, whitebark pine, Canada lynx, bald eagles, elk habitat potential, bats and mines, flammulated owls, northern goshawks, Harlequin ducks, black-backed woodpeckers, white-headed woodpeckers, and fire.

Ecosystem Restoration

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

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

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

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

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

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

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

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

IPNF Restoration Activities, 1992-2002

Prior to completing the assessment, the IPNF had 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 3,159 acres were planted to these species in 2002. (This includes the new, more blister rust resistant white pine). These three species tend to be best adapted to local climate, and most resilient to droughts, insects and root disease, and fire.

- From 1992-2002 there were 62,104 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 2002 the IPNF planted approximately 494,646 rust resistant white pine seedlings.

- From 1992 through 2002 the Forest planted over 10,976,729 rust resistant white pine seedlings.

The second part of our strategy involves maintaining white pine as a forest component while they grow and mature. This includes retaining 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). The guidelines include pruning natural reproducing young white pine. Since the publication of these guidelines, we have also included the pruning of genetically improved planted stock. This practice has been demonstrated to reduce mortality

significantly where implemented; thereby increasing the likelihood that white pine will be maintained during forest development.

- In 2002, the IPNF pruned approximately 2,597 acres where pine trees are a major portion of the forest.
- From 1992 through 2002, the Forest has pruned approximately 18,386 acres.

The implementation of the guidelines also ensures 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 where we harvest trees in 1996.

3) Managing tree stocking and forest structure

- 3,782 acres were thinned or released in FY 2002. Most of the thinning and release was to allow shade-intolerant larch, white pine, and ponderosa pine to maintain stand dominance, or to reduce density in over-crowded stands.

- From FY 1992-2002, 70,277 acres were thinned or released.

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

- There were 3,330 acres of harvest related natural fuel reduction.

- There were 4,516 acres of natural fuel reduction.

5) Watershed Improvement

- 150 acres of watershed improvement were accomplished in FY 2002.

- From FY 1992 to 2002 there were 9,847 acres of watershed improvement.

6) Road decommissioning

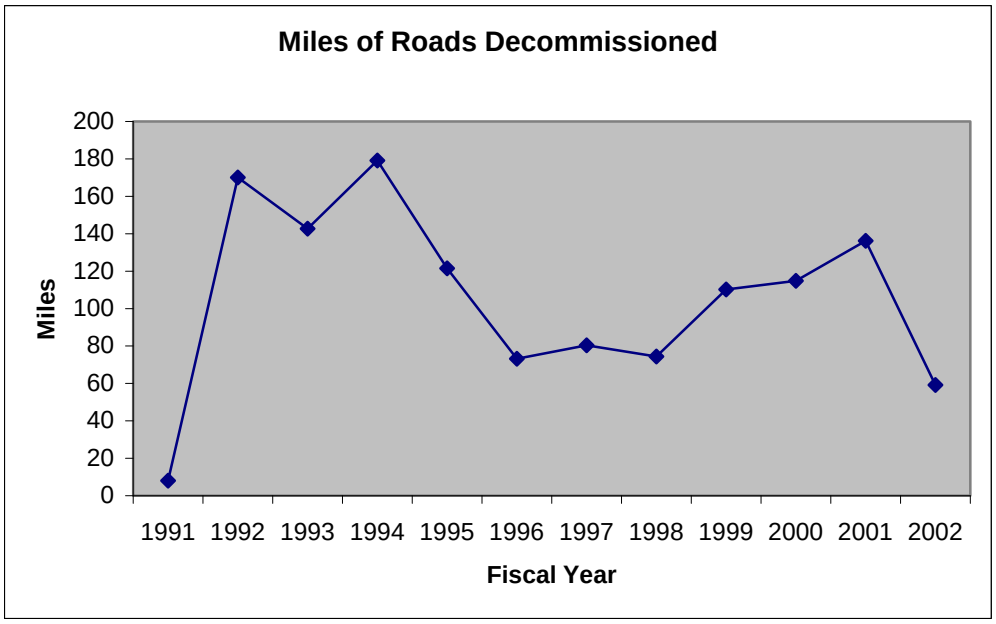
- There were 59.2 miles of road decommissioned in FY 2002 as part of ecosystem restoration work, using a variety of funds.

- Table 22 shows that there were 1,269.9 miles of road decommissioning on the IPNF from FY 1991-2002. Classified roads are generally the ones that are inventoried, maintained and managed by the forest. The unclassified roads are not.

Table 22. Miles of Roads Decommissioned

FISCAL YEAR	CLASSIFIED ROADS	UNCLASSIFIED ROADS	ALL
1991	0	8.0	8.0
1992	141.8	28.3	170.1
1993	115.2	27.6	142.8
1994	119.3	59.9	179.2
1995	95.9	25.7	121.6
1996	58.9	14.3	73.2
1997	79.2	1.1	80.3
1998	71.5	2.8	74.3
1999	51.9	58.3	110.2
2000	91.8	23.0	114.8
2001	107.0	29.2	136.2
2002	40.2	19.0	59.2
TOTAL	**972.7**	**297.2**	**1,269.9**

Figure 12. Miles of Roads Decommissioned



Future Restoration Activities

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

- 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.
- 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.
- Restoring whitebark pine by two methods: 1) Reintroducing prescribed fire to encourage whitebark pine restoration; and 2) Collecting whitebark pine cones and testing seeding for blister rust resistance, to begin developing blister rust-resistant whitebark pine seed sources.

- Thinning dense stands to favor white pine, ponderosa pine, and larch, and to promote large trees and reduce competition for moisture on dry sites.

- Restoring riparian areas and protecting inland native fish strongholds.

- Protecting habitat for threatened and endangered species, such as woodland caribou, gray wolf, grizzly bear, and bald eagle.

- An important aspect of our ecosystem management strategy is to focus restoration activities in priority areas where multiple ecological problems can be addressed. The objective is to improve the condition of several ecosystem components and not just a single one, such as vegetation or aquatics.

Old Growth

The 1987 Forest Plan, Standard 10b. calls 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. Forest Plan Standard 10a. incorporates the definition of old growth developed by the Regional Old Growth Task Force, documented in: *Green, and others. 1992. Old Growth Forest Types of the Northern Region. USDA, Forest Service, Northern Region*.

From 1990 through 1993 we did an intensive inventory of old growth resources. Since that time, we have continued to update our old growth inventory as the forest changed in response to natural events, and as more data became available. The information below was extracted from our database in May 2003, and represents the approximate situation at the end of 2002. Starting in 2001 and likely continuing through 2004 the Idaho Panhandle National Forest is undertaking a comprehensive review of old growth data, and doing some new field exams, to be sure our database does the best job possible of depicting current conditions on the ground. We don't expect major changes, but we are continually striving to increase the quality of our information about this important forest ecosystem component. As a result of this ongoing review, there are a few changes in this report's old growth totals as compared to the previous years'. Final results from this comprehensive review should be incorporated in our databases by 2005.

Old growth distribution will never be entirely static because forests are living, changing natural communities. Disturbances such as fire, insects, pathogens, and weather events may eliminate old growth from some areas. Meanwhile, other stands growing and aging will reach old growth status. The IPNF has almost 600,000 acres of mature forest, some of which has the potential to grow into old growth in the next few decades. We will continue to update our old growth data in response to changing conditions on the ground, and as we obtain new information.

Our database 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 are specifically identified and "retained" to meet the 231,000-acre forest plan standard, and "additional" identified old growth that serves old growth ecological functions, even though it is not formally allocated for this purpose.

"Existing Old Growth" fully meets (and usually exceeds) all Northern Region old growth defining criteria at the stand level. The "Ancient Cedar" category is also part of our existing allocated old growth, but we track it separately because we want to take special note and care of these unique stands. "Ancient Cedar" stands contain some 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 stand defining criteria, but is lacking somewhat in some criteria. The most common situation is that the "potential old growth" has more than enough large trees to meet old growth criteria, but some of the trees are not quite old enough. However, these are usually the largest and oldest trees we have in a given area, and with time can be expected to meet the age criteria as well. Some "potential old growth" is included in our old growth allocation because it is the best that we have available in an area, and distribution of old growth across the landscape is important. Other allocated "potential old growth" blocks are small pieces that contribute to the integrity of a larger patch of allocated old growth, or serve as part of a corridor linking two old growth patches. Larger old growth patches are generally more valuable as wildlife habitat, and linkages across the landscape are important. Allocated potential old growth contributes to the functional integrity of old growth, and is managed as part of our old growth allocation. This is consistent with the direction in Green and others (1992) about the importance of using landscape ecology considerations, as well as individual stand attributes, in selecting land to be allocated as old growth.

Old growth totals are presented in Table 23. Forest Plan Standards call for us to maintain 231,000 acres of old growth (10% of our forested acres). We have identified and allocated 276,494 acres (12.0% of forested acres) to be retained as old growth. We also have an additional 5,859 acres (0.3% of 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 9,756 acres that have been aerial photo identified as likely old growth, but have not yet been field checked.

Table 23. Acres of Old Growth By River Sub-Basin

Sub-Basin (River)	Allocated Existing Old Growth *(codes 9, 10)*	Allocated Ancient Cedar *(code 2)*	Allocated Potential Old Growth *(code 11)*	Total Allocated Old Growth *(codes 2, 9, 10, 11)*	Additional Field Verified Old Growth *(code 12)*	Total All Old Growth *(codes 2, 9, 10, 11, 12)*
St. Joe	60,139	1,937	13,458	**75,534**	5,711	**81,245**
Coeur d'Alene	56,902	0	8,309	**65,211**	0	**65,211**
Pend Oreille	19,718	63	4,929	**24,710**	0	**24,710**
Kootenai	60,668	516	3,441	**64,625**	0	**64,625**
Priest	44,096	914	1,404	**46,414**	148	**46,562**
Forest Total	**241,523**	**3,430**	**31,541**	**276,494**	**5,859**	**282,353**

Forest Plan Standard 10i. states: "goals for lands to be managed as old-growth within those lands suitable for timber production are identified in the management area prescriptions." The table below displays both those goals by management area, and what we have currently allocated for old growth. Only the four management areas have specific Forest Plan old growth goals. Current old growth allocations meet and far exceed these Forest Plan goals.

Table 24. Acres of Allocated Old Growth Compared to Management Area Goal

Management Area	Management Area goal: "Maintain approximately *xxxxx* acres"	Allocated Old Growth acres
1	25,000	100,674
2	6,000	22,191
3	400	1,957
4	4,000	14,308

Forest Plan Standard 10e. says: "Old growth stands should reflect approximately the same habitat type series distribution as found on the IPNF." The following table displays old growth habitat type series distribution compared to the same distribution across all our inventoried acres.

Table 25. Old Growth Habitat Type Series Distribution

Habitat Type Series	% Inventoried IPNF Acres by Habitat Type Series	% of Allocated Old Growth by Habitat Type Series
Ponderosa Pine	< 0.1%	0.0%
Douglas Fir	6.8%	2.6%
Grand Fir	14.7%	5.5%
Western Red Cedar	16.1%	18.6%
Western Hemlock	37.7%	39.7%
Subalpine Fir	15.0%	18.5%
Mountain Hemlock	9.7%	15.1%
Lodgepole Pine	< 0.1%	0.0%

As displayed above, old growth on the IPNF does reflect approximately the habitat type series distribution of the forest. On 78.5% of the land the amount of old growth is proportional to, or more than proportional to the distribution of that habitat type series. Old growth distribution is less than proportional to habitat type series distribution only in the Douglas-fir and grand fir series, which occupy 21.5% of the land. The dry habitat type group (all of the Douglas-fir and the dry end of the grand fir series) occupies approximately 10% of IPNF land. The moist end of the grand fir series covers another 11.5 % of IPNF land, and is usually found at lower elevations and southerly aspects adjacent to the dry types.

The huge, severe 1910 burn and other big early 20th century fires, subsequent suppression of low severity fires, early 20th century timber cutting, root diseases, and bark beetles have all contributed to the low proportion of old growth in these two habitat type series. The discussion below explores the role of active management in sustaining and increasing the proportion of old growth on dry habitat types. Where the moister non-

riparian grand fir habitat types are adjacent to dry sites, the same fire risks, root diseases, and bark beetles that strike the dry sites have a high probability of carrying over into adjacent Douglas-fir / grand fir stands. What happens on dry sites can impact forest stand development on adjacent moister sites.

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 drier grand fir habitat types). Although these dry areas represent only about 10% of our forested acres, they are quite important in terms of the potential forest structures and plant and animal species they can 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 trees and favored large trees of the most fire-resistant species. (Tree species relative fire resistance from ordered higher to lower is: western larch, ponderosa pine, Douglas-fir, grand fir.) Frequent low-severity fires reduced the total number of smaller trees (thus limiting moisture demands that caused tree stress on these dry sites), and reduced dead woody fuels and live ladder fuel accumulations (thus reducing the risk of stand replacing wildfires). These frequent low-severity fires were the keystone natural process that maintained dry site old growth forest structures.

Now, on dry habitat types, approximately 70 years of effective fire suppression has allowed in-growth of dense stands of smaller trees and accumulation of high woody fuel loads. Lack of fire has favored Douglas-fir and grand fir over ponderosa pine and larch. The large number of trees in these denser stands creates higher moisture demands than in the historic, fire-maintained open stands. This higher moisture demand stresses the old growth trees during drought times, and predisposes stands to bark beetle outbreaks. During drought years this can result in high levels of mortality amongst old trees in these unnaturally dense stands. Dense Douglas-fir and grand fir are also more susceptible to root diseases and bark beetles than historic forest structures. Dense Douglas-fir / grand fir stands on dry sites have a low probability of surviving long enough to become old growth. In addition, the dense small trees can serve as fuel ladders that carry flames into the upper canopy of large old trees. This new situation creates an unnaturally high risk of stand replacing crown fire, which will kill old trees that historically were able to survive surface fires. Suppression of all low severity fires has actually created a situation that threatens the continued existence of old growth on these dry sites, and reduces the chances of current mature and immature stands surviving long enough to become old growth.

On dry sites, restoration or mimicking of historic disturbance processes may be necessary to meet the Forest Plan standard of maintaining old growth. In those places where we find dry site old growth stands with unnatural in-growth of dense smaller trees (particularly firs), contributing to elevated drought stress and elevated risk of stand replacing fire, we may look at restoration opportunities. Restoration may include various mixes of prescribed fire, thinning, and planting of historic shade intolerant, fire adapted tree species. The driving objectives will be maintenance of old growth characteristics, and restoration of historic old growth structures and processes. Where old growth is

lacking, similar restoration activities may be necessary to create forests that are capable of surviving long enough to become old growth.

Whitebark Pine

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

Whitebark pine is a shade-intolerant trees species that requires canopy openings for regeneration. The Clark's Nutcracker bird extracts seeds from whitebark pine cones and caches them in the soil in open areas. If the opening is large enough, some of these seeds can germinate and potentially grow to mature whitebark pine. Burned areas provide the ideal opportunity for this regeneration.

Although whitebark pine trees are not highly resistant to fire, it is relatively more fire resistant than either spruce or subalpine fir. Low and mixed severity fires likely give whitebark some advantage over those species. Where whitebark pine grows in mixed species stand, if there is no significant canopy-opening disturbance over a long time, whitebark pine will eventually be replaced by the other species. In mixed species stands, fire is essential to maintain whitebark pine. At higher elevations, fire clears away other competing vegetation, and also opens sites for whitebark pine regeneration.

Whitebark pine is extremely sensitive to the introduced disease, white pine blister rust, which is now significantly and continuously reducing the whitebark population. On mature whitebark pine, blister rust usually kills the tops of the trees first, reducing or eliminating their seed producing potential.

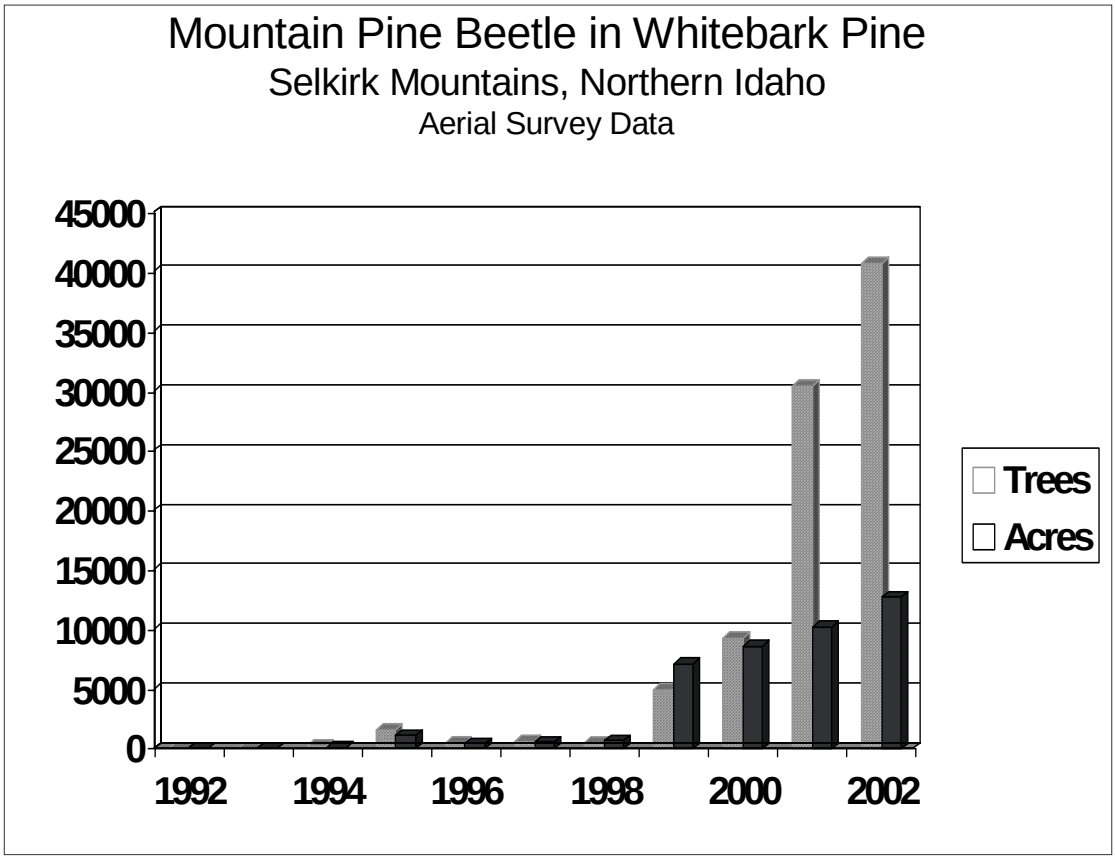
Whitebark pine is also subject to periodic mountain pine beetle outbreaks that kill many trees. Historically, prior to the introduction of blister rust, after mountain pine beetle had reduced the whitebark population, forest fires provided opportunities for new whitebark pine regeneration. However, now populations (and seed production potential) of whitebark pine are already significantly reduced by blister rust. After mountain pine beetle goes through these weakened stands, there may be little or no seed-producing whitebark pine left. And, fire suppression that remains effective for long enough may result in total elimination of whitebark pine seeds source before the next canopy opening disturbance. When blister rust mortality, the effects of fire suppression, and the impact of mountain pine beetle come together, whitebark pine can be virtually eliminated from some mountain ridge systems. This pattern of loss is exactly what appears to be happening in high elevation areas across much of the Idaho Panhandle.

The largest and most continuous whitebark pine population remaining in Idaho, north of the Clearwater River, is on the high ridges in the northern Selkirk Mountains. Although this population had suffered a slow decline from blister rust, it was still clearly the best, most continuous, and largest whitebark pine population left in this part of northern Idaho.

Aerial surveys in late summer of 1999 discovered a major mountain pine beetle outbreak in the northern Selkirk Mountains whitebark pine. During the summers of 2000 and 2001 Forest Service entomology crews did bark beetle ground-survey work in the northern Selkirks, and found that the mountain pine beetle outbreak was very large, still growing, and killing a high percentage of the mature whitebark pine trees in some areas. Aerial surveys likewise showed a large and escalating mountain pine beetle outbreak in this whitebark pine population. In 2002 both the area of the beetle outbreak, and the number of trees killed continued to increase from what was seen in previous years.

The following graph, from Regional entomologist Sandy Kegley, provides aerial survey data on how the mountain pine beetle outbreak has grown. In interpreting this graph, be aware that it's based on aerial survey counts and mapping of trees killed by mountain pine beetle. In most cases, trees attacked and killed one year don't turn red until the following summer, and thus aren't visible from the air until the following summer. For this reason, these data likely under-represent current mortality. The 2002 aerial survey data shows an increase in both acreage affected and numbers of trees killed.

Figure 13. Mountain Pine Beetle in Whitebark Pine



The following are data from a report by entomologist Sandy Kegley, documenting 2001 ground surveys of mountain pine beetle on whitebark pine in the northern Selkirks.

Table 26. Mountain Pine Beetle on Whitebark Pine

Location	Cutoff Peak	Fisher Peak	Trout Lake	Farnham Ridge	East Russell Ridge
# WBP examined	202	139	200	35	117
WBP alive	118 (58%)	99 (71%)	167 (84%)	6 (17%)	7(6%)
Year 2001 MPB attack	21 (10%)	17 (12%)	11 (6%)	3 (9%)	24 (21%)
Year 2000 MPB attack	32 (16%)	14 (10%)	4 (2%)	2 (6%)	50 (43%)
Older MPB attack	24 (12%)	6 (4%)	13 (7%)	19 (54%)	30 (26%)
Unknown or secondary mortality	7 (3%)	3 (2%)	5 (3%)	5 (14%)	6 (5%)
Total Dead	84 (42%)	40 (29%)	33 (17%)	29 (83%)	110 (94%)
WBP killed by MPB in last 2 years	53 (26%)	31 (22%)	15 (8%)	5 (14%)	74 (63%)
WBP infected with BR	164 (81%)	90 (65%)	134 (67%)	20 (57%)	78 (67%)

Results vary between different locations. By 2001, depending upon location, from 8% to as much as 63% of the whitebark pine in the survey areas had been killed by mountain pine beetle within the previous two years. From 17% to as much as 94% of the whitebark pine were dead, depending upon area. Out of all the trees sampled, 26% had been killed by mountain pine beetle within the previous two years, and 43% of all whitebark pine trees sampled were dead. These numbers do not count either mortality represented by very old snags, or year 2002 mortality. Where there were still trees alive, whitebark pine mortality from both mountain pine beetle and blister rust is expected to continue over the next few years.

We did not install any new formal mountain pine beetle ground survey plots in 2002. However, Sandy Kegley did some cursory examinations while looking for areas to conduct beetle pheromone tests. There are few big whitebark pine left in the Pyramid Lake area and on Russell Ridge (at least not enough to conduct a pheromone test—we couldn't find 150 live large trees within a reasonably contiguous area). On a previous survey in the Trout Lake area in 2001, only 11 out of 200 trees sampled were currently infested with mountain pine beetles. A visit to Trout Lake in Oct. 2002 found numerous

currently infested trees had not yet faded. Trout Lake is not as bad as the Pyramid Lake area yet, but it appears that the beetle populations are building at Trout Lake. We plan to conduct ground surveys at Trout Lake and Fisher Peak in 2003.

Given the high rate of infection from blister rust, compounded by this mountain pine beetle outbreak, we are very concerned about the future of whitebark pine on this National Forest. The pattern we're seeing here looks similar to what previously happened in other areas of the Forest (parts of the Salmo-Priest divide, and east side of the Mallard Larkins Pioneer Area) where the combination of blister rust and mountain pine has killed the overwhelming majority of the whitebark pine, and appears to have largely removed it as a functioning component of the ecosystem in those local areas.

Because of our concern about the decline of whitebark pine, the Bonners Ferry Ranger District is currently close to completing an Environmental Assessment, analyzing options for restoring whitebark pine in parts of the northern Selkirks through the use of release cutting and prescribed fire.

We are involved in a multi-regional, multi-year effort to identify whitebark pine that may be resistant to white pine blister rust. Cone collection started in 2001 with collections from 15 trees, and will continue in years with good whitebark cone crops. There was no whitebark pine cone crop in 2002, so there were no collections. Prospects for a 2003 whitebark pine cone crop look much better, and we are planning to collect. Over a five year period we will identify and collect cones from approximately 75 whitebark pine trees, and extract their seed. Seedlings grown from all these cones will be screened for blister rust resistance. Other National Forests are doing the same thing. The hope is to eventually develop seed sources of blister rust-resistant whitebark pine that can be used to help restore this species to its natural ecological role.

Canada Lynx

The second year of a 3-year lynx survey on the St. Joe Ranger District was 2002. Twenty-five transects effectively surveyed a 6,400 acre (100 square mile) area using the national lynx hair detection protocol. DNA analysis determined that none of 9 hair samples collected in 2001 were lynx. Results of samples collected in 2002 will be available in 2003.

On the Bonners Ferry Range District 5,287 acres in the Hall-Mission Lynx Analysis Unit were ground-checked to determine their condition for lynx. In some areas, the lynx model overpredicted lynx denning habitat; in others it underestimated it. Out of 1,501 acres which the model had predicted were capable of producing lynx denning habitat (large diameter trees, high canopy cover, and older decadent trees) 489 acres are not capable of producing lynx denning habitat. Six hundred ninety-one (691) additional acres which the model had not predicted as lynx denning habitat are likely to contain lynx denning structures.

Bald Eagles

The bald eagle is a federally listed threatened species. Forty-nine bald eagle nests were known in the Idaho Panhandle in 2002, up from 35 nests three years earlier. The following table shows the status of the nine bald eagle nests on the Idaho Panhandle National Forests.

Table 27. Status of Nine Bald Eagle Nests

Bald Eagle Nest	Number of chicks fledged	Comments
Lower Priest	No data	Nest wasn't checked. Priest Lake Ranger District
Upper Priest	1	Priest Lake Ranger District
Kalispell Island	2	Priest Lake Ranger District
Caboose	0	Nest wasn't occupied. Bonners Ferry Ranger District
Moyie	1	Bonners Ferry Ranger District
Robinson Lake	0	Nest wasn't occupied. Bonners Ferry Ranger District
Monarchs	2	
Whiskey Rock	0	New nest in 2002; active but abandoned Sandpoint Ranger District
Hoodoo Lake	1	New nest in 2002; Sandpoint Ranger District

The midwinter bald eagle count is a national survey which has been conducted annually since 1979. It is a cooperative effort of Idaho Department of Fish and Game, Bureau of

Land Management, Coeur d'Alene Chapter of the National Audubon Society, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers and the Forest Service. Over 110 bald eagles were counted at Wolf Lodge Bay during the last week of December.

Table 28. Bald Eagle Midwinter Count

Midwinter bald eagle route other than Wolf Lodge Bay	**Eagles counted**
Lake Coeur d'Alene	data not available
St. Joe River	3 adults
Priest Lake and Priest River	3 adults
Kootenai River	3 adults + 4 immatures
Pend Oreille River	data not available
Hayden Lake	1 adult
TOTAL	**10 adults + 4 immatures**

Other Birds

Flammulated Owl: The flammulated owl is a sensitive species on the Idaho Panhandle National Forests. Surveys for flammulated owls were conducted at two locations totaling 250 acres on the Bonners Ferry Ranger District. On the Coeur d'Alene River Ranger District, surveys were conducted for two or three nights each at eight locations. No flammulated owls were detected on the forest in 2002.

Northern Goshawk: The goshawk is a sensitive species. Thirty-three goshawk territories were monitored on the Idaho Panhandle National Forests in 2002. Thirteen active nests were found. Four nests fledged at least one chick each; the other nests were not monitored to determine productivity.

Table 29. Goshawk Monitoring

District	Acres Surveyed	Goshawk Territories	Active Nests	Goshawk Chicks
Bonners Ferry	several hundred	19 surveyed; 8 active	5	4
Coeur d'Alene River	approximately 12,000	10 surveyed; 6 active	6, including 1 new nest	no data
St. Joe	2,863	4 surveyed; 2 active	2 new nests	no data

Harlequin Duck: The harlequin duck is a sensitive species on the Idaho Panhandle National Forests. On the Sandpoint Ranger District, brood surveys totaled 17 miles on West Gold Creek, Grouse Creek, East Fork of Lightning Creek and Granite Creek. Pair surveys were completed on 49 miles, and brood surveys on 41 miles of streams on the St. Joe Ranger District.

Table 30. Harlequin Duck Monitoring

Survey Area	District	Adult Survey	Brood Survey
West Gold Cr.	Sandpoint	1 adult pair (2 mi. surveyed)	2 adult females; no broods (17 mi. surveyed)
Grouse Cr.	Sandpoint	no survey	no ducks seen
EF Lightning Cr.	Sandpoint	no survey	1 adult female
Granite Cr.	Sandpoint	no survey	no harlequin ducks seen
St. Joe River	St. Joe	2 females + 1 male (34.3 mi. surveyed)	no ducks seen (25.7 mi. surveyed)
Marble Creek	St. Joe	no ducks seen (8 mi. surveyed)	
Little North Fork Clearwater River	St. Joe	no ducks seen (6.8 mi. surveyed)	no ducks seen (8.1 mi. surveyed)
Bussell Creek	St. Joe		no ducks seen (5 mi. surveyed)
Heller Creek	St. Joe		no ducks seen (2.5 mi. surveyed)

Black-backed woodpeckers: On the Coeur d'Alene River Ranger District, drumming surveys for black-backed woodpeckers were completed again this year through a Challenge Cost Share agreement with the Coeur d'Alene chapter of the National Audubon Society. Surveys included Buckles Mountain, Beauty Creek, Cottonwood Creek, Crooked Ridge and Magee. Two black-backed woodpeckers were detected at Buckles Mountain and two at Beauty Creek. Four pileated woodpeckers (a management indicator species) were also heard during these surveys.

White-headed woodpeckers: Surveys at Stump Creek, Horse Ridge, Two Mile, Nuckles Gulch and Cottonwood Creek on the Coeur d'Alene River Ranger District found no white-headed woodpeckers.

Elk Habitat Potential

The elk is a management indicator species on the St. Joe and Coeur d'Alene River Ranger Districts. Elk habitat potential was unchanged from 2001 on the St. Joe Ranger District (Avery and St. Maries). On the Coeur d'Alene River Ranger District (Wallace and Fernan), the elk habitat potential increased slightly. Avery doesn't meet the Forest Plan standard for elk, but the other three areas do.

Table 31. Elk Habitat Potential

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

Bats and Mines

2002 was the sixth year of bat surveys on the Idaho Panhandle National Forests. Abandoned mines are important habitat for at least nine bat species in North Idaho, including Townsend's big-eared bat, a sensitive species. External mine surveys for bats were conducted at mines proposed to be closed for public safety, and mines which had already been closed with a bat gate or a culvert/gate combination. Typically only one or two surveys were conducted at each mine. More thorough surveys or internal mine surveys would have documented more bat use of abandoned mines. Electronic bat detectors, mistnets and video cameras were used to document bat use. Only bats observed inside, entering or exiting a mine were counted.

Townsend's big-eared bat was captured at six mines; five were new sites for this species. Before 2002, this species was known from 7 other North Idaho sites (3 on the Idaho Panhandle National Forests, 3 on state land and 1 on private land). Bats were documented using 75% of the twenty open mines which were surveyed. This percentage of use is similar to prior years' results. Bats were observed using 64 % of thirty-three gated mines. Most surveys found one or a few bats per mine. Sixty-one bats were observed using one mine which had been gated three years earlier. This is the most bats we have observed using a single mine in North Idaho in six years of surveys. These scientific name abbreviations apply to the next 3 tables:

COTO – Townsend's big-eared bat
MYEV – western long-eared bat
MYVO – long-legged bat
MYLU – little brown bat
MYsp – unknown species of genus Myotis
UNK – unknown bat species

Table 32. Open Mines Surveyed

MINE	COTO	MYEV	MYVO	MYLU	MYsp	UNK	no bats
Woodrat #8	X	X					
Kavanaugh	X	X			X		
Clear Grit Adit		X					
Eureka		X					
Silver Rock		X					
Big Elk # 1	X			X			
"Consolidated Silver Lead"	X			X			
Clear Grit Cabin		X			X		
Kilroy North			X		X		
Lakeview		X	X		X		
Hudlow	X			X			
Kilroy South	X				X		
Woodrat #7	X				X		
Big Elk #3							
Black Horse #1	X					X	
Fourth of July							
Blue Ribbon	X						X
Clear Grit Shaft	X						X
Nickelplate #4	X						X
Regal (upper)	X						X
Ward Peak	X						X

Table 33. Gated Mines Surveyed

MINE	COTO	MYEV	MYVO	MYLU	MYsp	UNK	no bats
American Girl	X				X		
Bethlehem #1			X		X		
Bethlehem #3						X	
Better Times							X
Bluebird #2						X	
Idaho Star East						X	
Lawrence #2							X
Lawrence #5						X	
Lawrence #7	X	X	X		X		
Pend Oreille #1		X					
Pend Oreille #3b							X
Pend Oreille #6	X				X		
Pend Oreille #6b	X						
Sailor Boy		X					
Samson #1		X					
Silvertip #2					X		

Table 34. Culverted Mines Surveyed

MINE	COTO	MYEV	MYVO	MYLU	MYsp	UNK	no bats
Bluebird Bigme							X
Bluebird#1		X					
Bluebird #2						X	
Hidden Treasure #2						X	
Idaho Star West						X	
Lawrence #1							X
Lawrence #3						X	
Lawrence #4							X
Lawrence #8							X
Nickelplate #1							X
Pend Oreille #3					X		
Pend Oreille #8					X		
Silvertip #1							X
Snowbird						X	
Two Mile #2							X

Other Mines Surveyed

The Copper Kopje gate was closed with a grate-style closure which does not meet the standards for bat accessibility. No bats were found there during the survey.

Fire

To sustain the diversity of our forests we need to understand the natural disturbance processes that historically shaped these ecosystems. Fire history studies in the Coeur d'Alene Basin indicate that between 1542 and 1931, a major fire event (a fire or fires cumulatively covering at least 20,000 acres) occurred somewhere every 19 years on the average. For example, in the Coeur d'Alene Basin major fire events occurred in 1931, 1926, 1919, 1910, 1904, 1896, 1889 (may have been larger than the 1910 fire), 1878, 1870, 1859, 1844, 1830, 1814 (burned 1/3 of the basin), 1790, 1772, 1764, 1654, 1580 and 1542.

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

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

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

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

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

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

Table 25 shows wildfire occurrence data for the IPNF. For 1969 through 2002 the total number of fires per year ranged from 44 in 1993 to 586 in 1994. We averaged approximately 161 fires per year; 70% of these were lightning-caused. The data for total number of wildfire acres burned per year shows that during this period the total number of acres burned per year varied from 4 in 1993 to 3,221 in 1970. Wildfires burned an average of 678 acres per year; this is about 2.2% of what would have been generated as a long-term running average by historic natural processes.

Wildfires are now largely suppressed by human beings (especially low and mixed severity fires). In 2002, the IPNF responded to 112 wildfires that were suppressed after burning 55 acres. About 75% of the fires were natural (lightning caused) and 25% were human caused.

For the 16 years since the Forest Plan was adopted (1987-2002), the IPNF has responded to 2416 wildfires, which burned 10,663 acres. Our last major stand replacing wildfire occurred in 1967. Without human suppression, over a historically typical 16-year period, wildfires might have burned 496,000 acres (although only 208,000 would have been stand replacing fires).

Wildfire vs. Human Disturbance

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

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

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

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

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

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

Table 35. Fire Occurrence

FISCAL YEAR	Lightning Fires	Person Fires	**TOTAL FIRES**	Lightning Acres	Person Acres	**TOTAL ACRES**
1969	37	71	108	96	171	267
1970	267	61	328	51	3,170	3,221
1971	105	46	151	49	112	161
1972	148	33	181	7	117	124
1973	69	86	155	13	1,526	1,539
1974	158	120	278	183	1,735	1,918
1975	58	43	101	9	70	79
1976	59	47	106	2	84	86
1977	188	79	267	23	67	90
1978	40	31	71	5	47	52
1979	201	120	321	110	2,585	2,695
1980	52	23	75	10	12	22
1981	94	48	142	10	14	24
1982	91	49	140	13	20	33
1983	24	35	59	0	374	374
1984	182	72	254	33	16	49
1985	93	44	137	771	12	783
1986	125	46	171	31	852	883
1987	56	70	126	11	274	285
1988	58	57	115	316	706	1,022
1989	99	39	138	92	86	178
1990	48	49	97	5	140	145
1991	76	46	122	11	2,530	2,541
1992	106	31	137	20	397	417
1993	23	21	44	1	3	4
1994	530	56	586	2,417	74	2,491
1995	56	31	87	8	15	23
1996	87	30	117	30	290	320
1997	66	12	78	11	6	17
1998	166	32	198	60	2	62
1999	127	34	161	20	67	87
2000	27	184	157	2,756	6	2,762
2001	120	21	141	236	18	254
2002	84	28	112	26	29	55
Total	**3,850**	**1,638**	**5,488**	**7,436**	**15,627**	**23,063**

APPENDICES

A. Forest Plan Monitoring Requirements

B. Forest Plan Amendments

C. List of Contributors

D. Water Quality Monitoring Results

Appendix A. Forest Plan Monitoring Requirements

Table 36. Forest Plan Monitoring Requirements

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

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

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

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

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

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

Appendix B. Forest Plan Programmatic Amendments

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

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

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

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

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

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

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

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

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

Appendix C. List of Contributors

The following individuals contributed information to this report:

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Forest Plan Monitoring Item G-2: Water Quality

Item G-2 describes the monitoring efforts that check and evaluate the implementation and effectiveness of forest management activities on watersheds, water resources, and their beneficial uses within the Forest. Practices include Best Management Practices (BMP) monitoring, which cover implementation and effectiveness monitoring of activities that took place in 2002.

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

Following are the results of the 2002 monitoring efforts on the Forest.

Monitoring Report 2002
Bonners Ferry Ranger District R1-04-D7
Maureen Palmer – Hydrology Technician

Type of Monitoring: Effectiveness of road decommission and obliteration projects **(**PRACTICE 15.25 - Obliteration of Temporary Roads). The objectives of this monitoring were to evaluate the condition of decommissioned roads over time, to determine if "Best Management Practices" (BMPs) applied are effectively protecting watershed resources and to identify solutions for BMP implementation problems. The project reviewed was the Upper Boundary Watershed Restoration Project covered in the Blue Grass Bound Environmental Assessment, 1999. Two hydrology technicians conducted ocular and photo documentation during July 2002.

Upper Boundary Watershed Restoration: The project area covers the sixth and seventh level watersheds, which make up the greater Boundary Creek fifth level watershed. They include Saddle and Shorty Creek, (sixth level, 10.3 sq. miles), Grass Creek (sixth level, 27.4 sq. miles), and Blue Joe Creek, (seventh level, 10.7 sq. miles). This restoration is being accomplished in phases through the decommissioning of approximately 100 miles of road. 43 miles of road have been decommissioned in the three phases 1,2, and 2B completed to date. Phase 3 & 4 are planned for implementation in 2003-2004.

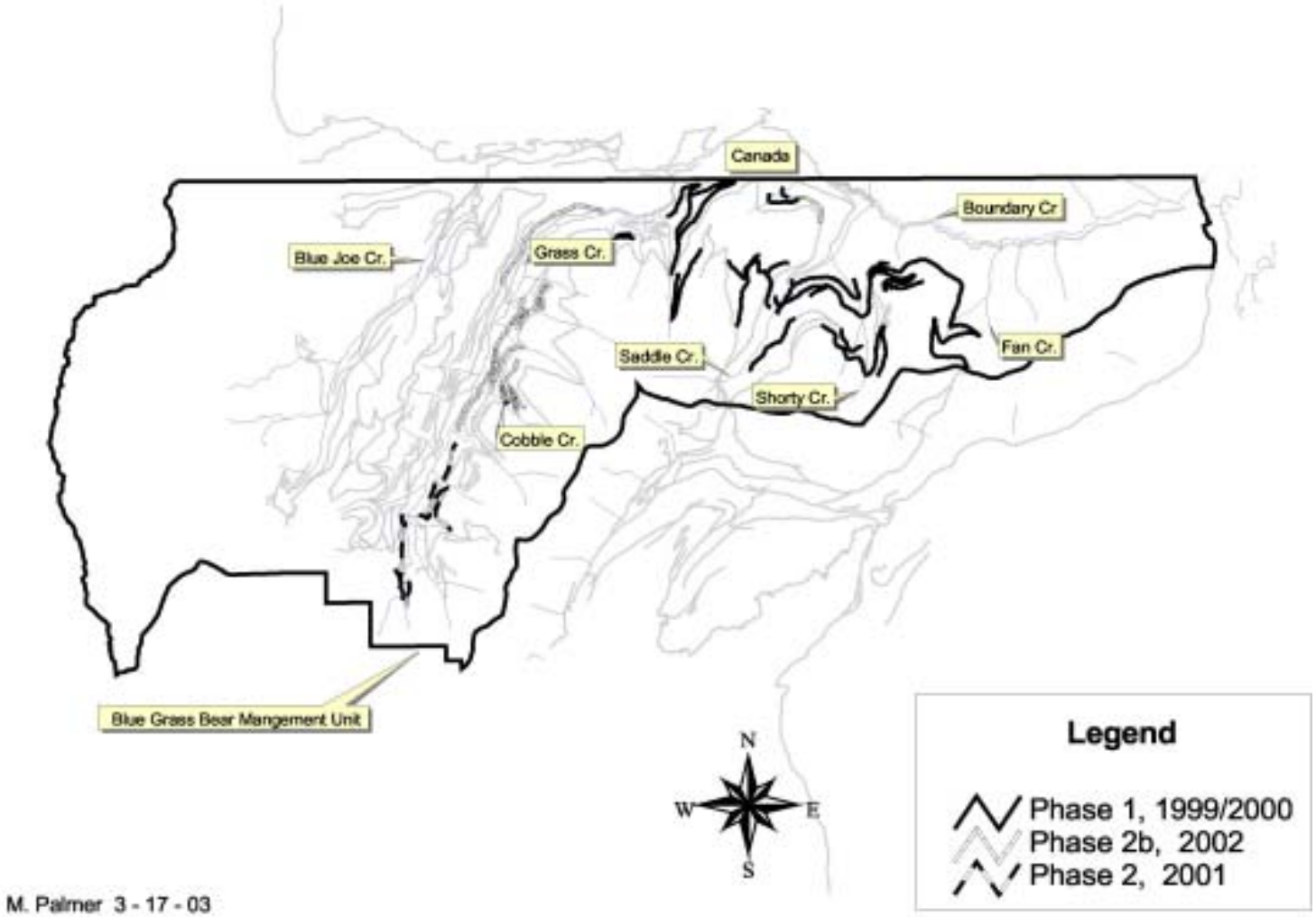
The objectives of this project were to assure that management in the greater Boundary Creek watershed supports habitat for fisheries, aquatic organisms, and recreational uses by promoting recovery and maintenance of stream channel form and function, and water quality. The long-term objectives of decommission and obliteration work is to restore the natural slope hydrology through full or partial recontour, and to reduce mass failure risks from unmaintained roads with stream channel crossings and fill slope instability.

The implementation of road decommissioning has proven successful in reducing sediment delivery to streams and restoring watershed health. Stream channel restoration involves the removal of drainage structures and reconstructing channels to natural slope contours, widths and gradients. The removal of cross drain culverts, and the construction of permanent waterbars or full or partial recontour was used to break up the extensive ditchline networks that have resulted in increased channel densities, water yield and sediment delivery. Covering the newly disturbed soils with certified noxious weed free seed, straw mulch and slash reduces surface erosion while the sites are reestablishing native vegetation.

Brief Summary: The road systems that were monitored will be discussed by phases. Site-specific examples will be used to demonstrate the amount of success achieved or provide information on practices that are not meeting watershed goals and objectives.

Upper Boundary Road Decommissions

Phase 1, 2, 2B



M. Palmer 3 - 17 - 03

Phase 1

In the fall of 1999 and the summer of 2000, 27 miles of road decommissioning and obliteration was accomplished using a Public Works "Request for Quotation"(RFQ) contract. An excavator and dozer were used under time & equipment to perform the reconstruction. The inspectors were responsible for spreading the grass seed and straw mulch.

The effectiveness monitoring was accomplished July 17-18, 2002. The roads monitored were randomly selected. Approximately 33% of the roads treated in Phase 1 were monitored.

Observations: During the monitoring of Phase 1 approximately 50 perennial and ephemeral stream crossings were observed. The channels appear stable, overall bank slope stability was excellent, and channels did not widen or down cut significantly. Minor down cutting was evident on approximately 45% of the 50 stream channels. For the majority of the channels, this down cutting fell within the expected natural adjustment after reconstruction. The down cutting ranged from 2-10 inches, the average being 2-4 inches.

The road decommissions successfully reestablished slope hydrology where full recontour was implemented. There were a few sites where small amounts (a few cubic yards per site) of recontoured slope slumped or slid; this was attributed to recontours that were over-steepened or affected by overland flow. The failures were unfortunate, but not critical to the overall success of the restoration sites.

The permanent waterbars met the design criteria and have effectively drained wet ditch lines. The waterbars were placed on an average of every 40-50 feet on segments of road that were determined stable, but where the ditch line was actively flowing and down cutting. Minor surface erosion was observed on approximately 5% of the waterbars. The decomposed granitic soils that were encountered throughout Phase 1 are erosive and until revegetated will have some minor erosion. Increasing ditch line relief using waterbars more frequently than the prescribed 40-50 feet on extremely wet segments of road would decrease the amount of water flow from the ditch line, and therefore reduce the erosive energy. There were a few short segments of road that in hind sight would have been better prescribed to full or partial recontour. Recontouring would have reestablished slope hydrology and removed excess road fill.

The revegetation of the disturbed soils ranged from an estimated 10% to 95% germination success of the seed mixture placed at the time of restoration, with the average being 65-70%. Grasses were approximately 4-7 inches tall on average. There were multiple reasons for the success or failure of the seed germination. Birds may be consuming grass seed before germination takes place. Decomposed granitic soil has poor nutrient value. If there were not sufficient organic materials available to enhance soil production then seed germination was compromised. Another factor was inadequate protection from either straw or slash and prolonged periods of dry and hot weather while seed was establishing. The sites with more moisture had an obvious advantage and germination was typically more successful. Native plants have reestablished themselves throughout the Phase1 project area; due to their natural acclimation they are capable of surviving on the harsher sites.

The placement of slash when available is an enormous benefit to restoration work because it provides micro sites for revegetation, enhances nutrient cycling, dissipates water energy, protects the soil surface, and enhances slope stability. Approximately 60% of the mileage of these roads systems had adequate slash to cover the recontoured slopes and channel restorations.

Figure 1: View upstream Cobble Creek rd.#2464 culvert failure 1998, before recontour.

Figure 2: Downstream Cobble creek recontour photo taken 6-24-2002 (Phase 1)

Figure 3: Left bank Cobble Cr. 1998 before recontour

Figure 4: Right bank Cobble Creek, note vegetation and use of slash.

Figure 5: Left bank Cobble Creek recontour, work accomplished 1999 photo taken 2002

Phase 2

In the autumn of 2000, 6.44 miles of 14 planned miles of road decommissioning was accomplished using a Public Works " Request for Proposal" (RFP) contract. Due to the late start up date, the high elevation project area and inclement weather, the completion of the entire mileage was not accomplished that season. The remaining mileage was divided up between Phase 2B and Phase 3. The road reconstruction was accomplished using excavators and a dozer. The contractors were responsible for the grass seed and straw mulch application.

Unlike Phase 1, where the inspectors were on site providing direction throughout the decommissioning, this Request for Proposal (RFP) contract requires the contractor to provide their own quality control. The RFP contract used pay items with specifications to delineate the restoration work.

The road decommissioning consisted of the following elements (pay items):

- 201A (01) Roadway Brushing – Design quantity – MI (mile)
- 202 (02) Removal of Metal Pipes (relief) – Actual Quantity – EA (each)
- 203 (20) Drainage Excavation, Type: Permanent Waterbar - EA
- 210C (01) Stream Channel Restoration, Category 1- Actual Quantity – EA
- 210C (02) Stream Channel Restoration, Category 2 – Actual Quantity – EA
- 210C (05) Stream Channel Restoration, Category 0 – Actual Quantity - EA
- 210C (04) Full Road Recontour – Design Quantity – MI
- 601 (01) Mobilization – Lump Sum Quantity – "LS"
- 625 (05) Seeding, Dry Method (without mulch) – Design Quantity – AC (acre)
- 625 (07) Seeding, Dry Method (with mulch) – Design Quantity – AC
- 637 (11) Large Dump Truck – Actual Quantity – HR (hour)
- 637 (12) Med. Crawler tractor with Dozer & Rippers – Actual Quantity – HR
- 637 (13) Hydraulic Excavator, Max 180 HP – Actual Quantity – HR

Under this new contract, Forest Service inspectors were responsible for contract compliance and quality assurance. This was a new method of contract administration for road decommissioning on the district and came with its' own learning curve.

The effectiveness monitoring was accomplished July 22, 2002. Due to time constraint only 10% of the total Phase 2 decommissioned mileage was reviewed. Effectiveness monitoring of Phase 2 will be continued during the 2003 field season to review a greater portion of the accomplished mileage. The observations noted below may not be representative of the overall implementation effectiveness for Phase 2.

Observations: The quality of restoration in Phase 2 varied on the roads monitored. The greatest variation occurred on stream channel reconstruction. Eight stream channels were evaluated. Two of the eight channels had down cut and widened approximately 2-4 feet, the remaining channels had minimal down cutting (approximately (3-5) inches). The

channels with the more serious down cutting occurred on category # 1 (0-15 ft. of fill over outlet of crossing) stream channel restoration. Down cutting and widening occurred in areas where the soil type was erosive sand, and where the channels were left constricted and did not match the stream morphology or gradient below the outlet. Due to these channel adjustments the stream banks are steep and will continue to slump and adjust until their angle of repose is met.

The fully recontoured road segments evaluated successfully reestablished slope hydrology. There was no evidence of slope slumping or failure.

The implementation of 45 foot spacing of permanent waterbars met the design criteria, effectively draining the road surface and wet ditch lines. The waterbars were constructed on segments of road that were determined stable, but where the ditch line was actively flowing and down cutting. Minor soil erosion was noted within the waterbars or the road surface between the waterbars during the Phase 2 monitoring. This minimal erosion was attributed to vegetation that remained on the road prism between the waterbars because of improperly implemented brushing specifications.

The revegetation of the disturbed soils ranged from an estimated 15% to 90% germination success of the seed mixture placed at the time of restoration, with the average being 45-55%. On the average grasses were approximately 4-5 inches tall. The seed mixture applied at the rate of 24 pounds per acre included Streambank Wheatgrass, Sandberg's Bluegrass, Slender Wheatgrass, and White Dutch Clover. Fertilizer applied at the rate of 200 pounds per acre consisted of Nitrogen, Phosphorous, Potassium, and Sulpher. There were multiple reasons for the success or failure of the seed germination. As stated in Phase 1 observations, soil composition, birds eating seed, insufficient soil cover (straw or slash) were some of the reasons. In Phase 2 the seed was applied late in the autumn and did not germinate until the following spring or summer. Some of the seed may have been washed off site during spring run-off. Inspecting for compliance of the seeding specification was difficult when the application of the seeding was not observed. Native plants have reestablished themselves through out the Phase 2 project area; due to their natural acclimation they are capable of surviving on the harsher sites.

Again as stated in Phase 1, the placement of slash when available is an enormous benefit to restoration work. During Phase 2 it was noticed that the scattering of slash was insufficiently implemented. The special project specifications within the contract provide for the application of this restoration technique. Improved written description and detailed drawings may help clarify work expectations. The pre-work meeting may also provide an opportunity to emphasize this project specification.

Figure 6:Category 1, view over channel to left bank, photo taken in 2000 (Phase 2)

Figure 7: Same site as figure 6, photo taken 2002 (Phase 2) poorly revegetated even though straw was adequately implemented.

Figure 8: Right bank of same stream crossing as above, photo taken in 2000

Figure 9: Same site as figure 8, photo taken 2002

Phase 2B

In the summer of 2001 approximately 10 miles of road decommissioning was accomplished using a Public Works "Request for Proposal" (RFP) contract. The road reconstruction was accomplished using an excavator and a dozer. The contractors were responsible for the grass seed and straw mulch application. Forest Service inspectors were responsible for quality assurance by checking contractor compliance to contract specifications. The RFP contract used pay items with specifications to delineate the restoration work. The pay items are the same as stated in the Phase 2 write-up.

The effectiveness monitoring was accomplished July 22-23, 2002. The random selection of roads monitored was approximately 50% of the total road mileage planned for decommission in the Phase 2B project area.

Observations: Approximately 30 channel restorations were reviewed in the Phase 2B project area. Overall stream bank slope stability was excellent, and channels did not widen or down cut significantly. The worst down cutting observed was 10-15 inches on three different channels. The average down cutting was 3-6 inches. Some adjustment is expected in the stream channels after reconstruction and the majority of the channels fell within the expected range of down cutting. The more serious down cutting and widening occurred because the channels were left constricted and did not match the stream morphology or gradient below the outlet.

The road segments prescribed to full recontour successfully reestablished slope hydrology and reduced mass failure risk associated with unstable fill slopes.

The permanent waterbars met the design criteria and have effectively drained wet ditch lines. The waterbars were placed every 45 feet on segments of road that were determined stable, but where the ditch line was actively flowing and down cutting. Minor surface erosion was observed where the waterbar construction left the middle of the waterbar higher than the ditchline. This improper implementation of the waterbar design creates a pooling effect at the inlet that forces the water to cut through the high portion of the waterbar in order to drain. Approximately 70 feet of ditch line was not draining as designed. Waterbar placement did not meet the design criteria at that site, due to poor implementation. The decomposed granitic soils that were encountered throughout Phase 2B are erosive, and until revegetated there is a risk of continued erosion.

The successful germination of the grass seed sown by contractors varied from 0-80% with the average being 45-55%, and grasses averaging 3-4 inches in height. This wide range of successful germination was attributed to the same reasons as stated in Phase1 and Phase 2. Another factor during Phase 2B was inadequate protection from either straw or slash and prolonged periods of dry and hot weather while seed was establishing. The sites with more moisture had an obvious advantage and germination was typically more successful. Inspecting for compliance of the seeding specification was difficult when application of the seeding was not observed. As in Phase 1 and 2 native plants have reestablished themselves through out the Phase 2B project area.

During the Phase 2B monitoring many of the restoration sites were impacted by cattle trails. This is due to a cattle allotment that is active during July through October

that is not restricted to pastures. Cattle create trails and compact soils within the restoration sites, which inhibit the growth of vegetation and contribute to stream bank instability. July through October also coincides with the prime growing season for vegetation within the project area. These impacts were also observed during the Phase 1 and Phase 2 project areas.

Slash was extremely abundant throughout the majority (80%) of the Phase 2B project area. However, the placement was haphazard and not as effective as it had the potential to be. Often slash was dumped in piles instead of being scattered, which did not meet the intent of the specification. There were no visible negative resource impacts from this procedure, but it did not provide the full extent of soil and plant protection sought. The lack of quality control from contractors while distributing slash is an example of the difference in quality of product using "RFP" construction contracts versus time and equipment. When time and equipment is used the inspector is on site through out the project, and can direct placement of slash as needed to best enhance the project site. The special project specifications within the "RFP" contract provide for the application of this restoration technique. Improved written description and detailed drawings may clarify work expectations. The pre-work meeting may also provide an opportunity to emphasize this project specification. Placement of slash is somewhat time consuming and therefore an area where contractors may try and save time by not being as thorough as we would like.

Figure 9: Excavator removing road fill off old wooden bridge (Marsh Creek) - 2001

Figure 10: Marsh Creek after bridge removal, photo taken 2002

Figure 11: Plugged pipe on perennial stream on rd# 636-UA photo taken 2001

Figure 2: Same perennial stream as in figure 11, saturating road prism causing severe slope instability.

Figure 13: Recontoured road prism, same site as in figure 12 photo taken 2002

Note: the use of slash was well implemented at this site.

Summary

The different procedures used during decommission of all three phases to obtain the objectives for watershed restorations have been effective. Full recontour has effectively reestablished natural slope hydrology and overall slope stability has been improved. Most reconstructed stream channels observed were stable, minimum significant down cutting was observed. Waterbar construction has proven effective at breaking up the ditch line flow therefore minimizing the potential for further down cutting and road prism saturation. The revegetation of disturbed soils was expedited by the use of grass seed and straw mulch. The proper placement of slash, when available, has been extremely effective at enhancing the revegetation process.

Observations during the 2002 monitoring have reinforced the understanding that the benefits gained from decommissioning abandoned road systems; outweigh the temporary disturbance created by doing so.

Lessons learned:

- Reconnaissance during field review for contract preparation needs to be as thorough as possible. This thorough field review will improve the quality of the information necessary to prepare contracts. The more accurate the contract specifications are, the less likely the need for modifications.
- Descriptive contract specifications and drawings will reinforce the quality of the end product that is sought.
- For watershed restoration projects, time for a pre-work meeting needs to be established to clarify contract specifications, Forest Service and Contractor authorities, and provide an opportunity for contractors to ask and answer questions.
- Keep accurate and descriptive daily diaries and photo documentation.
- Opportunities to improve upon channel reconstruction will always be available depending on the amount of resources (money) to implement those improvements. With the information gained through the monitoring process we will become aware of the inadequacies of prescriptions, which in turn will help develop a better eye during the planning stages of the contract preparation.
- The use of partial obliteration instead of waterbars when appropriate is often more effective at reestablishing slope hydrology.
- When financially and logistically feasible, the use of force account to plant native seedlings would expedite the revegetation time frame.

Moss Creek Channel Rehabilitation Monitoring

Rehabilitation activities occurred in the Moss Creek channel subsequent to the failure of the railroad-crossing fill (506 Road) in 1996. In-stream structures included log steps to create pools, impede sediment transport, and re-establish channel substrate. These structures were placed in the channel through and immediately above the debris fan at the confluence of Loop Creek. A native seed mix was sown on unvegetated banks of the channel as well as on the debris fan that had been deposited along the Loop Creek channel. The fan was also mulched and willows and conifers were planted.

South Zone hydrologists John Macy and Piper Goessel conducted effectiveness monitoring of the site in the fall of 2002. In-stream structures were intact and functioning (see photos). Grasses were established on the fan and banks (see photo). Willows and conifers planted on the fan were less than vigorous.

2002 Central Zone Watershed Monitoring Report
Idaho Panhandle National Forest
Coeur d'Alene River Ranger District
December 17, 2002
Cathy Slinger

Type of Monitoring: Implementation

District: Central Zone

Project Name: Sunny Horizon Rehab

Site Locations: Roads 499A, 499B, 499C, 499D, 499E, 499F, 6849, 6849A, 6849E, 6849F, 202K, 202-1, 202-2, and 202-3.

The Sunny Horizon Rehab public works contract implemented restoration work on a total of 19.63 miles on fourteen different roads. A total of 53 stream channel crossings were removed on these fourteen roads. There were 20 Category I's, 21 Category II's, 6 Category III's, and 6 Category IV stream channels restored. Full obliteration was not required for watershed improvement on all of these roads. Of the 19.63 miles worked, 0.78 miles of road were recontoured while 16.44 miles of road had 142 waterbars constructed across the running surface. Roads not waterbarred were either full recontoured or had a flat surface and did not require that prescription. All channel sites on these roads were restored to natural conditions regardless of the prescription applied to the rest of the road.

On road 6849, one 18" culvert was added to accommodate an active spring running across the road surface. A 24" culvert was upgraded to a 30" culvert to meet INFISH requirements for 100year flood events. No culverts were removed on this road, but 38 drivable waterbars were added to protect the road from scouring.

One Riparian road next to Searchlight Creek, 202K, was full recontoured for one mile, and 8 channel sites were removed. Roads 6849F, and 202.1 were closed with a 200' front-end obliteration. Road 499A was closed with a 300' front-end obliteration.

All excavated areas were seeded with native seed mix except for waterbars. Fertilizer was used in conjunction with the seed mix, excluding 50' on each side of a channel site.

Type of Monitoring: Implementation

District: Central Zone

Project Name: BRC Rehab

Site Locations: Roads 206A, 206B, 206C, 209UB, 2341, 2341UA, and 2341UB.

The BRC Rehab public works contract implemented restoration work on a total of 12.44 miles on seven different roads. A total of 18 stream channel crossings were removed on these roads. There were 2 Category I's, 5 Category II's, 5 Category III's, and 8 Category IV stream channels restored. Full obliteration was not required for watershed improvement on all of these roads. Of the 12.44 miles worked, 1.35 miles of road were full recontoured while the other roads had 15 waterbars constructed across the running surface. Roads not waterbarred had a flat surface and did not require that prescription Three of the seven roads had 200' front-end obliteration for road closure. All channel sites on these roads were restored to natural conditions regardless of the prescription applied to the rest of the road.
All excavated areas were seeded with native seed mix except for waterbars. Fertilizer was used in conjunction with the seed mix, excluding 50' on each side of a channel site.

Type of Monitoring: Implementation

District: Central Zone

Project Name: Fernan Heli Rehab

Site Locations: Roads 108 P.O., 1562, 1593N, 1593TUB, 2337B, 2339A, 2339AUB, and 2339AUD.

The Fernan Heli Rehab public works contract implemented restoration work on a total of 7.77 miles on 8 different roads. A total of 12 stream channel crossing sites were restored to natural conditions on these 8 roads. There were 4 Category I's, 6 Category II's, and 2 Category III, stream channels restored. Approximately 30 waterbars were constructed on road 2339A, all other roads did not need this prescription. Roads 1593N, 1593TUB, 2337B, 2339AUB, and 2339AUD were closed with a 200 foot front-end obliteration. On road 1562, one 18 inch culvert was upgraded to a 30 inch culvert, and a 24 inch pipe was upgraded to a 49 inch arch pipe, to meet INFISH requirements for 100 year flood events. A riprap outfall apron was also installed at this arch pipe. Three rolling dips were added to road 1562 to provide water relief in areas where rilling on road surface was a problem. One culvert was removed on road 108 P.O., which is also part of the Canfeild motorcycle trail #9, and a drivable low water ford was in installed.

All excavated areas were seeded with native seed mix except for waterbars. Fertilizer was used in conjunction with the seed mix, excluding 50' on each side of a channel site.

Type of Monitoring: Implementation

District: Central Zone

Project Name: Cherry Bug Rehab

Site Locations: Roads 437UZA, 625UG, 625UH, 1526, 1526A, 1526D, Line Creek, 1528, and 6002A

The Cherry Bug Rehab public works contract implemented restoration work on a total of 10.38 miles on 9 different roads. A total of 15 stream channel crossing sites were restored to natural conditions on these 9 roads. There were 8 Category I's, 5 Category II's, and 2 Category III, stream channels restored. Approximately 58 waterbars were constructed on 4 of the roads worked. Roads not waterbarred had a flat surface and did not require that prescription. Approximately 5.19 miles was fully recontoured on all roads except the 1526D, which will remain an open road.

All excavated areas were seeded with native seed mix except for waterbars. Fertilizer was used in conjunction with the seed mix, excluding 50' on each side of a channel site.

Type of Monitoring: Implementation

District: Central Zone

Project Name: W.F.Steamboat Rehab

Site Locations: Roads 1531, and1538

The W.F.Steamboat public works contract implemented restoration work on a total of 10.54 miles on 2 different roads. A total of 20 stream channel crossing sites were restored to natural conditions on these 6 roads. There was 2 Category I's, 6 Category I's, 8 Category III's, 2 Category IV's, and 2 Category V, stream channel crossings restored throughout the project area. Both roads had front-end obliteration closures installed on them for road closures. A total of 55 waterbars were installed over 10.54 miles of road in the project area.

All excavated areas were seeded with native seed mix except for waterbars. Fertilizer was used in conjunction with the seed mix, excluding 50' on each side of a channel site.

2002 Central Zone Watershed Monitoring Report
Idaho Pandhandle National Forest
Coeur d'Alene River Ranger District
December 18, 2002
Cathy Slinger

Type of Monitoring: Effectiveness

District: Central Zone

Project Names: Brett Creek, Black Canyon, and E.F. Big Creek Rehab.

2002- Effectiveness Monitoring of past road and channel sites, on the Coeur d'Alene River Ranger District to determine if stream crossing removal was effective in reducing downstream sediment. The projects were implemented in the years 1997 and 2001.

Brett Creek Riparian Road- All 6 channel sites monitored looked completely stable, and functioning properly. Streambanks in all of the crossings were very stable with no bank erosion occurring due to a wide floodplain, designed to accommodate natural channel adjustment. There was no evidence of any down cutting or head cutting present. All gradient control devices remained intact and functioning properly. The full recontour of the riparian road looked to be very stable with no sign of surface erosion, even after heavy spring runoff. Large woody debris was scattered along the road to further stabilize the area. The use of large rock provided additional stability to creek banks in areas where the stream channel meandered close to the recontour. Vegetation has become well-established in most areas and regeneration of future large woody debris is occurring naturally. Two large earthen barriers are functioning properly to protect restoration efforts and provide wildlife security.

Black Canyon Road 6308A- The first 4 sites on this road were monitored for effectiveness in reducing sediment to downstream reaches. Restoration activities occurred in 1997 on 9 very deep channel crossings. Monitored sites #1, 3 and 4 were Category IV's. All three miles of road prism were recontoured to prevent further mass failures from occurring. Site #1 had been a large channel site supporting a broad floodplain on the main stem of Black Canyon Creek. Careful observation and monitoring of this site showed that it is very stable, and is hydrologicly functioning properly mostly due to three log truck loads of large woody debris hauled in and placed on stream banks and in the stream channel itself. There was no head cutting or down cutting evident. Stream channel is meandering and functioning properly and no stream bank erosion was found. Gradient

control devices were functioning properly and effectively storing sediment. The roadbed was fully recontoured and though the terrain was very steep, all remained stable with no surface erosion or mass wasting present. Vegetation along with natural tree regeneration was growing abundantly. Site #2 was a small Category II headwater swale, with gentle slopes and lots of vegetation. There was no sign of channel bank erosion and gradient devices remained completely intact. Site #3 had more problems due to very steep drainages and sensitive soils in this area. Approximately 7 cubic yards of the stream bank had sloughed into the channel due to natural stream meander, and steepness of the banks, but are stabilizing naturally. Stream banks should have been pulled back further to provide a wider floodplain area, and laid back to a more gentle grade, with more large woody debris added to provide extra stability. All but one gradient device was intact and functioning properly. Site #4 had approximately 5-6 cubic yards of bank material sloughing, due to the steep grade in that drainage. Two out of the six gradient control devices were not functioning, due to scouring of the channel bed. A minimal amount of head cutting had occurred, approximately 2 cubic yards, but seemed to have stabilized itself with time.

E.F. Big Creek Road- Before restoration was performed, this riparian road was providing large amounts of sediment into the stream, due to stream banks head cutting up the natural hillside and the mass wasting of sections of the road prism. A large amount of woody debris was flown into these problem sites by helicopter and placed on stream slopes by an excavator. This procedure had a real positive effect in providing stability. One old bridge, which negatively influenced stream flow, was removed and disposed of. Two Category I channel sites were rehabbed, and were observed to be in stable condition, with no problems occurring. The full recontoured roadbed seemed to be stable except for a few minor areas of sloughing due to heavy runoff in the spring, where the stream had naturally meandered close to the road. All restoration activities provided a more stable condition in this municipal watershed and reduced the amount of sediment being transported into the stream. There was evidence of heavy ATV usage on the first half of this road causing minor erosion. Natural vegetation has established itself along with a few noxious weeds.

Overall, the restoration activities were effective at reducing downstream sediment. In no cases was the storage capacity of the channel exceeded, and no impacts to downstream reaches occurred. Sediment inputs associated with the restoration activities were negligible compared to the effects of the stream crossing failure that would have eventually occurred in the absence of the restoration activities.

Eight long-term Forest Plan water quality monitoring stations with water level recorders were maintained through the 2002 water year (10/1/2001-9/30/2002). Although continued validation of watershed assessment tools were not complete at the time of this year's publication, the record of two parameters are plotted in the charts below. Each chart displays the total sediment and maximum discharge observed over the period of record for each station.