Idaho Panhandle National Forests

FOREST PLAN

MONITORING AND EVALUATION REPORT

2001

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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 2000.

The Forest Plan identifies 22 monitoring and evaluation items. (See Appendix A for requirements.) It requires that 12 items be reported every year, one be reported every 2 years, and 9 others be reported every 5 years. All 22 items were reported in FY 1998; the 12 annual items 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
H-1	Threatened and Endangered Plants
I-1	Minerals
K-1	Prescriptions and Effects on Land Productivity

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

II. SUMMARY OF FINDINGS

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

- The Forest Plan established an average annual allowable sale quantity (ASQ) of 280 million board feet (MMBF) for the first decade after the plan was adopted. This was to occur on an estimated 18,688 acres annually. The Plan specified that the ASQ could increase to 350 MMBF in the second decade. The actual amount of timber sold has been much lower than anticipated in the Plan. In FY 2001, 65.8 MMBF was offered, 40.7 MMBF was sold, and 51 MMBF was harvested. The number of acres sold was 5,626. Payments to counties in FY 2001 totaled $7,985,683.

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

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

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

- In FY 2001, 40 projects were monitored for compliance with Forest Plan visual quality objectives. All were in compliance.

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

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

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

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

- The Forest continued eight of its long-term water quality monitoring stations. During Water Year (WY) 2001 the data from Bird and Skookum Creek was analyzed. The findings indicate that the stream flows in the undeveloped Skookum Creek is similar to the heavily developed Bird Creek. Bird Creek, however, generates far more sediment, thus a major restoration project is underway. Further investigations of the landtypes involved in the study watershed will be made, and recalibration of WASTED will follow if necessary.

- We are continuing to look for opportunities to use funds from a variety of sources to restore ecosystems. Examples of Forest ecosystem restoration work for FY 2001 are listed below. See the Ecosystem Restoration section of this report for more details.
    - Planting approximately 460,183 rust resistant white pine seedlings.
    - Planting approximately 2,980 acres of white pine, larch and ponderosa pine. These are species that are in short supply on the IPNF.
    - Reducing forest density by thinning 7,125 acres; most of this released larch, white pine and ponderosa pine.
    - Pruning 2,853 acres of white pine saplings. This reduces mortality from white pine blister rust.
    - There were 3,040 acres of harvest related natural fuel reduction and 4,437 acres of hazardous fuel reduction.
    - Improving 420 acres of soil and water resources.
    - Obliterating 136.2 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 267,840 acres (11.6% of our forested acres) to be retained as old growth. We have an additional 8,269 acres (0.4% 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 2001.

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 2001 for each of the twelve monitoring items discussed in this year's report.

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

Table 1. Quantitative Estimates of Performance Outputs and Services

Outputs and Services	Quantitative Estimates
Budget	$37,923,066
Total number of employees	475 (permanent and temporary)
Volume of timber offered	65.8 million board feet
Volume of timber sold	40.7 million board feet
Volume of timber harvested	51 million board feet
Total acres of timber sold	5,626 acres
Payments to counties	$7,985,862
Total reforestation completed	3,058 acres
Total number of seedlings planted	1,180,659
Timber stand improvement completed	7,125 acres
Pruning of white pine	2,853 acres
Soil and water improvement completed	420 acres
Roads maintained	3,225 miles
Roads constructed	2.7 miles
Roads reconstructed	0.2 miles
Roads obliterated	136.2 miles
Trails constructed/reconstructed	19 miles
Number of wildfires	141 fires
Acres burned by wildfire	254 acres
Harvest related fuel treatment	3,040 acres
Hazardous fuels reduction	4,437 acres
Wildlife habitat restored	450 acres
Wildlife habitat inventoried	4,010 acres
TES terrestrial habitat restored	4,277 acres
TES structures constructed	0 structure
TES terrestrial habitat inventoried	0 acres
TES stream habitat inventoried	0 acres
Noxious weeds treated	3,567 acres
Grazing allotments administered	5
Rangeland Monitored/Evaluated	1,000 acres
Abandoned mines reclaimed	29

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

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.

B. Forest Service Employment

Background

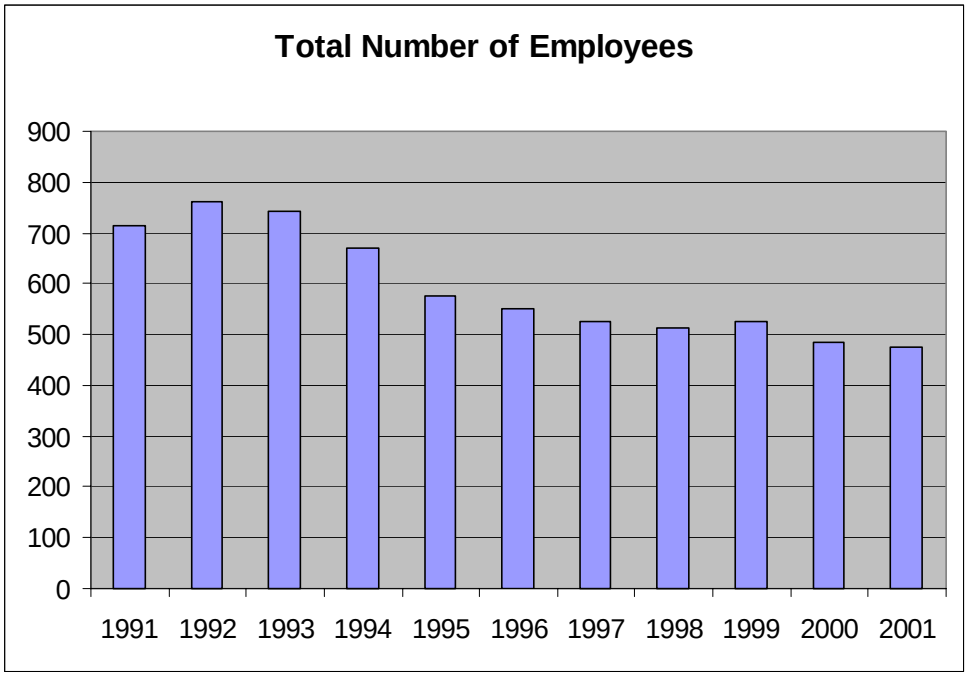
The people who work for the Idaho Panhandle National Forests spend money and contribute to the economy of the communities in which they live. As Forest Service employment goes up and down the amount of money contributed to the local economy also varies.

Monitoring Data

Table 5. 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

Figure 1. Total Number of Employees



Evaluation: Table 5 and Figure 1 show the way our workforce has changed from 1991 to 2001. We went from a high of 762 permanent and temporary employees in FY 1992, to 475 at the end of FY 2001. This loss of employment has had a greater effect on the smaller communities such as Bonners Ferry, Wallace and St. Maries than on communities like Coeur d'Alene and Sandpoint where significant population growth has occurred during the same time period.

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

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

Background

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

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

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

Monitoring Data

FY 2001: For this fiscal year the Idaho Panhandle National Forests offered 65.8 million board feet of timber for sale. We sold 40.7 million board feet.

FY 1991-2001: Table 6 depicts timber volumes offered and sold, and sale acreages for the past 11 years. Figure 2 that follows it graphically presents trends in volumes offered and sold. Figure 3 shows total acres sold.

Table 6. 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

Figure 2. Timber Volume Offered and Sold

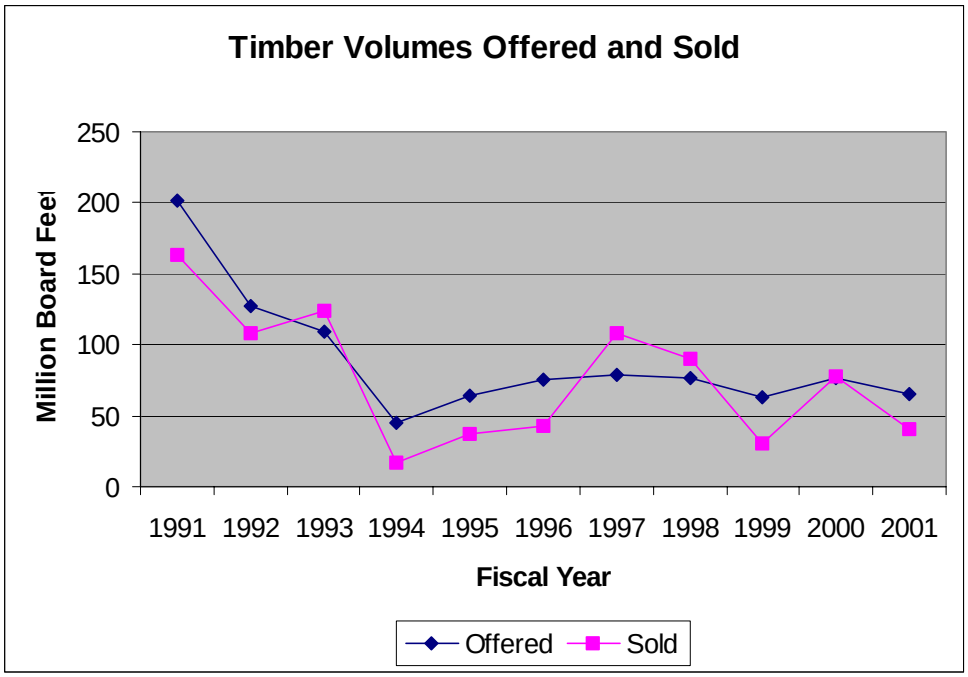
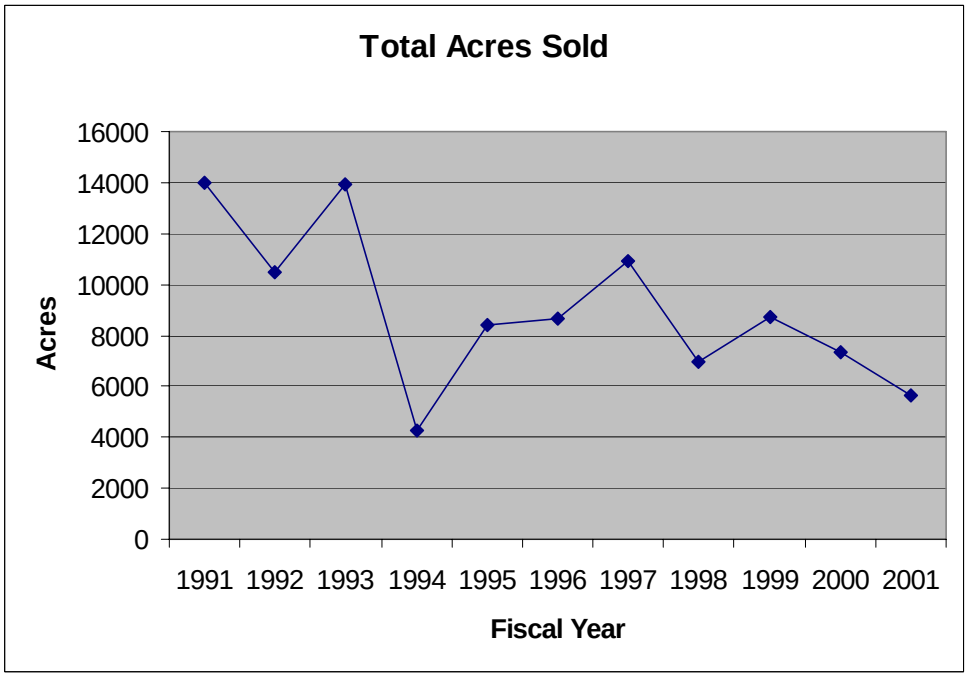


Figure 3. Total Acres Sold



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

Evaluation

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

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

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

Forest Plan Monitoring Item C-1: Visual Quality

Item C-2 addresses monitoring of timber sales on the Idaho Panhandle National Forests to assess effectiveness meeting Forest Plan Visual Quality Objectives (VQOs). Projects included in this report are summaries. Detailed reports are available at District Offices.

The 1987 IPNF Forest Plan uses the Visual Management System (VMS), the state-of-the-art methodology available for scenery analysis when the Forest Plan was framed. Visual Quality Objectives were established for the management of public lands in response to public outcries over clear cut harvest methods.

VQOs are in essence, our contract with the public for how we will manage their lands. From 1992 through 2001 the IPNF has moved away from clear cuts to the incorporation of lighter-on-the-land techniques to manage the timber resource. The chart in the B-6 Section of this Monitoring Report, *Harvest Methods by Percent from FY 1992 to FY2001*, illustrates the percentage of acres harvested using various methods and this trend. The highest number of clear cut acres took place in 1993. The 1,125 acres amounted to 8% of the total. There were no clear cut harvests from 1998-2000. In FY 2001, of the 5,626 acres harvested, only 53, or .9% were clear cut. Salvage harvest was the most used method in FY 2001 with 2,435 acres, or 43% affected. Commercial thinning was next with 1,599 acres or 28%. Both of these methods have potential to achieve more natural appearing, sustainable landscapes.

Forest VQOs describe a desired level of scenic quality and diversity of natural features based primarily on physical characteristics of an area. They refer to the degree of acceptable change allowed to alter the natural landscape. In the mid-1990's the Forest Service created and published an updated outgrowth of the Visual Management System, called the Scenery Management System. According to Deputy Chief, NFS, Gray Reynolds in a letter on Public Perception dated August 22, 1994, this effort was "guided by a significant increase in constituent demand for high-quality scenery," and the public's insistence "that scenery is one of the most highly valued resources in our national forests." In response, "a small leadership group developed the Scenery Management System, an updated and significantly improved VMS."

SMS introduces a few new and important concepts, most notable of which is recognition of the dynamic character of scenery with emphasis on existing landscape character and change through time. SMS emphasizes the role and value of cultural and historic landscape elements and goes beyond VMS to establish the value of intactness of a landscape based on a broader more inclusive criterion that includes cultural and ecological considerations. Unlike VMS, SMS establishes the valued character of the landscape during the interdisciplinary planning process, not before, and not without public input.

Whereas both systems recognize public concern for maintaining "interesting and pleasant, natural appearing landscapes with high scenic diversity", SMS uses easily understood descriptive terminology to describe landscapes management objectives. VQOs were described in terms of labeled categories, Preservation, Retention, Partial Retention,

Modification, and Maximum Modification. SMS uses Scenic Integrity Levels (SILs). SILs include descriptions of the ecological processes that formed and sustain a given landscape to arrive at the degree of intactness acceptable in a given landscape.

The Idaho Panhandle National Forests are currently involved with Forest Plan revision and incorporating the SMS into the updated, revised Forest Plan. This provides opportunity to review our adherence to the pertinent laws and regulations as well as incorporate the best tools available to manage the scenic resource.
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Here's how we did in fiscal year 2001.
Forest Plan Monitoring Item #C-1: Achieving Visual Quality. Determine if project activities implemented Forest Plan visual quality objectives.

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

Table 7. Timber Sales Sold

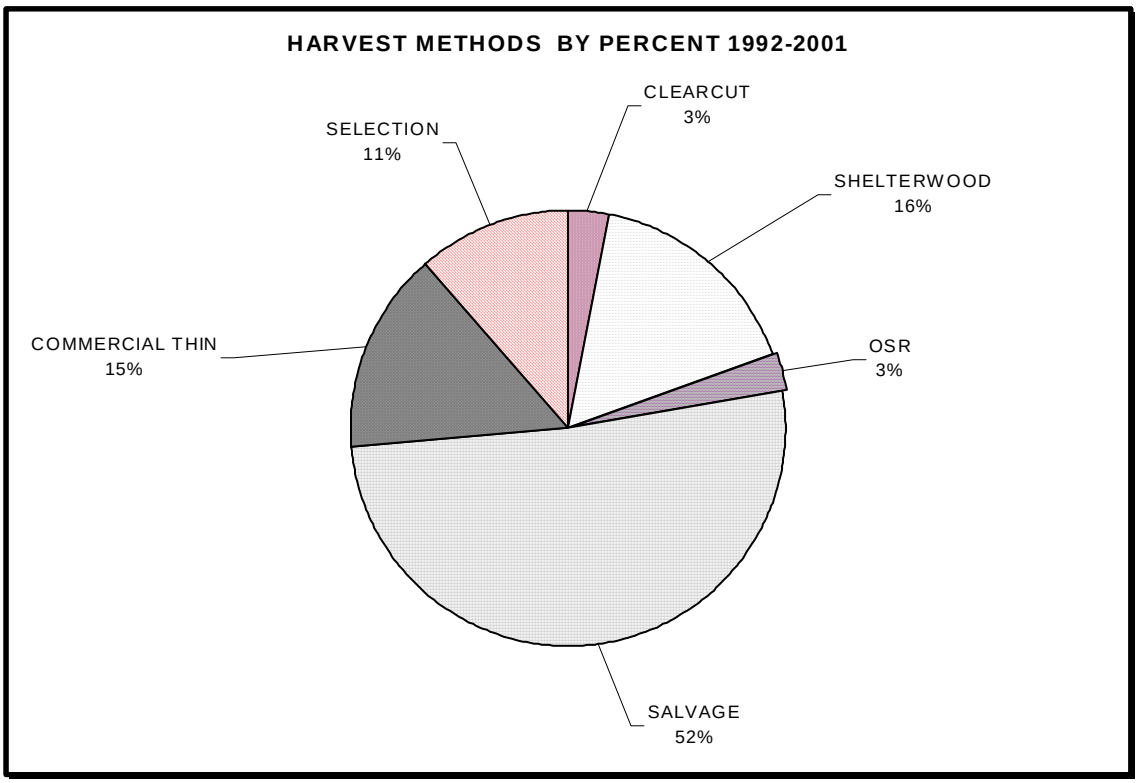
Timber Sales Sold in FY 2001	
Timber Sale Name	*Should the sale meet the Forest Plan VQO's?*
Priest Lake R.D.	
Lakeface Lamb	Yes, with the exception of rehab units for dying WP which will not meet VQO initially, but will in time.
Binarch	Yes
Bismark	Yes
Dusty	Yes
Flat Moores	Yes
Watson	Yes
Bonners Ferry R.D.	
Beetles in Paradise	Yes
Big Mack	Yes
Mama Cascade	Yes
New View	Yes
Salt Lick	Yes
Solomans Wood	Yes

Sandpoint R.D.	
White French	Yes
Jeru Lindsey	Yes
Longshot	Yes
Packsaddle South	Yes
Central Zone	
Avista Beaver	Yes
Beaver Heli Ice	Yes
Little Brown Bug	Buy back
East Side Heli Bug	No activity
Rookie Hart Salvage	Yes
Alder Beetle	Yes
Beauty & Beast Heli	Yes
Blue Swan Heli Bug	litigation
Ward Ridge	litigation
Ruby Red Heli Bug	litigation
Sands Creek	Yes
Bug Lite Horse	Yes
Fernan Beetle Heli	Yes
Hogback Beetle	litigation
Killarney Bug	No activity
Pleasant No Bug Heli	litigation
Scatterwall Heli Bug	Yes
Windy Buttes Beetle Heli	Yes
Yellow Horse Beetle Heli	No activity
South Zone	
King Kong	Yes
Little Corny II	Yes
Watch the Birdie	Yes – Did not sell
East Slate	Yes – Did not sell
Turn It Up	Yes

Summary: As the data attests, the Idaho Panhandle National Forests were well under the 10% allowable departure from Forest Plan direction in meeting Visual Quality Objectives for FY 2001. Sales pending completion will be reviewed upon their completion. See Appendix E "Visual Quality Monotoring Summaries – Closed Sales" on page 119.

The majority of FY 2001 timber sale units were harvested using partial cut treatments. Since the inception of the Forest Plan in 1987, the IPNF has trended away from visually impactive methods of harvesting towards more visually sensitive methods. Of approximately 85,000 acres harvested between FY 1992 and 2001, 3% were clearcut. The IPNF is increasing its use of harvest methods that should result in more natural appearing landscapes characterized by variety of color, form and texture.

Figure 4. Harvest Methods Used



(Total harvested acres: 85,114)

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 1991-2001.

Table 8. 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

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 2001, 285 citations were issued. This is a increase of 121 citations over the 164 issued in FY 2000. The reason for the large increase may, in part, be attributed to the general population increase in the Coeur d'Alene area to the increase of road closures on the Idaho Panhandle National Forests.

Forest Plan Monitoring Item E-1: Heritage Resources

Background

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

Monitoring Data

a. *Timber Sales*—The forest reported (and the State Historic Preservation Office reviewed) seven 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. *Facilities*—A Passport In Time volunteer project continued the restoration of the Red Ives Ranger Station, which is listed on the National Register of Historic Places. The work completed in 2001 included staining the exterior of buildings, repair of siding, repair of several doors, plumbing repairs, venting the attic of the ranger's house, reinstallation of the flagpole, seeding bare areas in the lawn, completing the installation of the railing and steps down to the powerhouse and continuing the work of restoration in the office.

The Forest developed a contract for the replacement of the wood shingle roofing on the ranger's house in keeping with its historic character. The Historic Preservation Team helped to write the specifications for this and reviewed it before the forest put it out for bid. A contractor completed the roof replacement before the end of the fiscal year.

c. *Trails*—The forest began construction of the “Route of the Hiawatha” Rail Trail in 1997. The 2001 work included installation of interpretive signs all along the trail and the completion of the surfacing of the trail through the St. Paul Pass Tunnel.

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

f. *Special Use Permits*—The forest inventoried seven special use permit proposals. The proposals were found to have no effect on any known heritage resources.

g. *Recreation*—The forest installed a new toilet and made miscellaneous repairs on the Arid Peak Fire Lookout, which is on the cabin rental program.

The forest designed and constructed a new vault toilet located at Red Ives Ranger Station historic site. The new toilet design conformed in appearance and materials to the other buildings on this historic site.

The forest also installed new toilets at twelve other locations. The toilet installations were either in areas that have already been inventoried or an archaeologist reviewed and or monitored the project. In all cases the archaeologists found that the projects had no effect on historic resources.

h. *Fire*—The Little North Fork Rx Fire project in the Little North Fork of the Clearwater Drainage will be carried out over the next four years. The Forest Archaeologist conducted a field review of the parts of this project area in 2001 and will complete the review in 2002.

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 Grizzly Bear Recovery Plan in 1993. 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 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, thereby, 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 Amended Biological Opinion for the Continued Implementation of the Idaho Panhandle National Forests Land and Resource Management Plan (4/11/01) requires the Forest Service to track:

* 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 greater than two miles per square mile
* 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).

The following tables show which BMUs met these standards in 2001.

Table 9. Grizzly Bear Habitat Status

2001 BMU Status	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**
Ball-Trout	57,907	43,049	74	16	9
Blue-Grass	57,325	28,188	49	30	29
Boulder *	62,368	30,239	48	35	35
Grouse **	66,979	27651	41	45	41
Kalispell-Granite	85,641	39,657	46	31	29
Lakeshore	17,967	2,881	16	82	56
Long-Smith	65,733	48,203	73	21	13
Myrtle	63,781	38,272	60	31	19
North Lightning	65,216	39,713	61	38	20
Scotchman	61,612	38,848	63	35	27
Salmo-Priest	87,115	55,754	64	30	24
Sullivan-Hughes	78,210	43,016	55	23	20
Northwest Peaks	18,588	N.D.	56	N.D.	N.D.
Keno	23,054	N.D.	60	N.D.	N.D.
LeClerc	77,176	24,468	33	24	49

*** Boulder BMU Open Road Density = 35% due to fire activity.**

****Grouse BMU numbers assume no contribution to core or low road densitites from private land.**

N.D. = No Data Available

As the following table shows, the five BMUs which met security, core and road density standards and guidelines in 2001 were the same as the previous year: Ball-Trout, Long-Smith, Myrtle, Salmo-Priest and Sullivan-Hughes. The other BMUs did not meet one or more management criteria for grizzly bears in 2001.

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

	% Core	% of BMU with open road density > 1 mi. per sq. mi.	% of area with total road density > 2 mi. per	Administrative Use
Goal =	**55% or more**	**< or = 33%**	**< or = 26%**	**< = 19 spring trips < 23 summer trips <= 15 fall trips**
Selkirk BMUs				
Ball-Trout	meets	meets	meets	meets
Blue-Grass	meets	meets	does not meet	meets spring and fall; 2 gates did not meet summer
Kalispell - Granite	does not meet	meets	does not meet	meets
Lakeshore	does not meet	does not meet	does not meet	meets
LeClerc	does not meet	meets	does not 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	does not meet	meets	does not meet	meets
Grouse	does not meet	does not meet	does not meet	meets
Keno	meets	no data available	no data available	meets
North Lightning	meets	does not meet	meets	meets
Northwest Peaks	meets	no data available	no data available	meets
Scotchman	meets	does not meet	does not meet	meets

Forest Plan Monitoring Item F-3 Caribou Recovery

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

Background

The Selkirk caribou population was 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.

This caribou population is generally found above 4000 feet elevation in the Selkirk Mountains in Engelmann spruce/subalpine fir and western redcedar/western hemlock forest types. In both the Kootenai River Basin and the Priest Lake Basin, caribou occasionally are found as low as the valley bottom. Caribou are adapted to boreal forests and do not occur in drier, low elevation habitats except as rare transients. Seasonal movements are complex in this population, which frequently crosses the U.S. / Canada international border. Earlier this century, caribou occurred as far south as Lewiston, Idaho; now they are restricted in the lower 48 states to the northern portion of the 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 along with continued research on caribou habitat preferences has indicated that the Forest Plan's five seasonal habitats are not distinct, but rather overlap in several seasons. Analysis thus far continues to support the assumption that early winter habitat in “target” condition is an important and possibly limiting factor for caribou recovery.

The Forest Plan defined target conditions for each of five seasonal caribou habitats. Achieving these target conditions is a long-term process that can be accomplished through manipulation of vegetation or natural succession. In addition, the Forest Service

will continue to implement recommendations of the caribou steering committee and recovery teams; support Idaho Department of Fish and Game and Washington Department of Fish and Wildlife in winter caribou censuses and monitoring radio-collared caribou; and research on predation and other factors that are preventing the recovery of this species.

The estimated population for woodland caribou in the Selkirk Ecosystem is 30 to 35 animals. The population is considered slightly lower than last year. Predation continues to be a significant factor impacting caribou populations, with mountain lions being the most predominant predator involved. Six caribou are known to have died in 2001. Four radio-collared caribou died from predation; 3 were classifed as unknown predation and the fourth as predation by grizzly bear. The other two known mortalities were caribou which were not fitted with radio collars.

Forest Plan Monitoring Item G-2: Water Quality

Item G-2 addresses 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. It also addresses validation monitoring that is used to validate and calibrate the assumptions used in planning and analysis, including the model and assessment parameters.

Best Management Practices (BMP) monitoring, which cover effectiveness monitoring of activities during 2001 of practices that took place earlier or during 2001. All of the projects listed in Table 13 are brief summaries. Detailed reports are listed in appendix D on page 85.

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

Since the watershed simulation program, WATSED, was used to help assess watershed responses to various alternatives, and continues to be used in project planning as one of the many tools to assist managers and watershed specialists to evaluate potential response and evaluate alternatives; G-2 also requires ongoing validation checks and calibration adjustments as necessary. Skookum and Bird Creeks are the two watersheds that were analyzed for this report. WATSED runs were not made on these watersheds. A comparison of measured data between these watersheds for the same years follows:

Skookum Creek is a tributary to the St. Joe River on the St. Joe River District. It is an 11 square mile watershed that is managed totally by the Forest. The drainage is characterized by belt geology with 30% of the drainage in the high elevation mountain hemlock and sub-alpine habitat type (cold snow zone, > 4500 ft). Slightly over 1% of the drainage has glaciated slopes and basins with 27% in break lands. It is an undeveloped watershed, with the exception of a road that exists near the ridge top in the headwaters. Most of the drainage was burned during the 1910 fire. A recording stream gage was established in 1976 near the watershed mouth. Streamflow, suspended sediment and water temperature have been collected since then and bedload sediment has been collected during the last several years. A full-time water temperature data logger was installed in the spring of 2001.

Bird Creek is a tributary to the St. Joe River on the St. Joe District. It is a 14.6 square mile watershed that is managed totally by the Forest. The drainage is characterized by belt geology with less than 4% of the drainage in the high elevation mountain hemlock and sub-alpine type (cold snow zone), and the rest of it being in the rain on snow zone (3000-4500 ft.). 6% of Bird Creek consists of moderately weathered belts and 28% in break lands. The lower portion of the drainage has predominated alluvial deposits. It has had extensive development both from road construction and timber harvest activities.

Fires burned just a small portion of upper Bird Creek during the last century. A recording stream gage was established in 1988 just upstream from the mouth. Streamflow, water temperature, suspended sediment and bedload sediment has been collected since 1988. A full-time water temperature data logger was installed in the spring of 2001.

Table 11. Bird Creek Monitoring

Bird Creek			Drainiage Area =		14.6	miles²
Bird Creek	Sediment Load		Stream Discharge (Q)			
Water Year	annual TOTAL (T/yr)	3-year running mean (T/yr)	mean daily (cfs)	peak day (cfs)	PEAK monthly (cfs)	PEAK duration (days)
88	98	98	17	184	87	27
89	115	107	33	358	178	28
90	112	108	32	240	116	48
91	3,632	1,286	59	826	136	68
92	119	1,288	27	106	76	74
93	226	1,326	32	170	114	55
94	112	152	19	163	83	33
95	92	144	22	306	71	30
96	22,291	7,499	72	521	190	40
97	35,207	19,197	55	492	275	30
98	45	19,181	23	115	68	50
99	1,046	12,099	32	240	116	48
00	193	428	35	309	160	28
01	67	435	16	201	97	22

Water Year	annual TOTAL (T/mi²/yr)	3-year running mean (T/mi²/yr)	mean daily (cfsm)	peak day (cfsm)	PEAK monthly (cfsm)	PEAK duration (days)
88	7	7	1.2	13	6.0	27
89	8	7	2.3	25	12.2	28
90	8	7	2.2	16	8.0	48
91	250	88	4.1	57	9.3	68
92	8	89	1.9	7	5.2	74
93	16	91	2.2	12	7.8	55
94	8	10	1.3	11	5.7	33
95	6	10	1.5	21	4.9	30
96	1,532	515	4.9	36	13.1	40
97	2,420	1,319	3.8	34	18.9	30
98	3	1,318	1.6	8	4.7	50
99	72	832	2.2	16	8.0	48
00	13	29	2.4	21	11.0	28
01	5	30	1.1	14	6.7	22

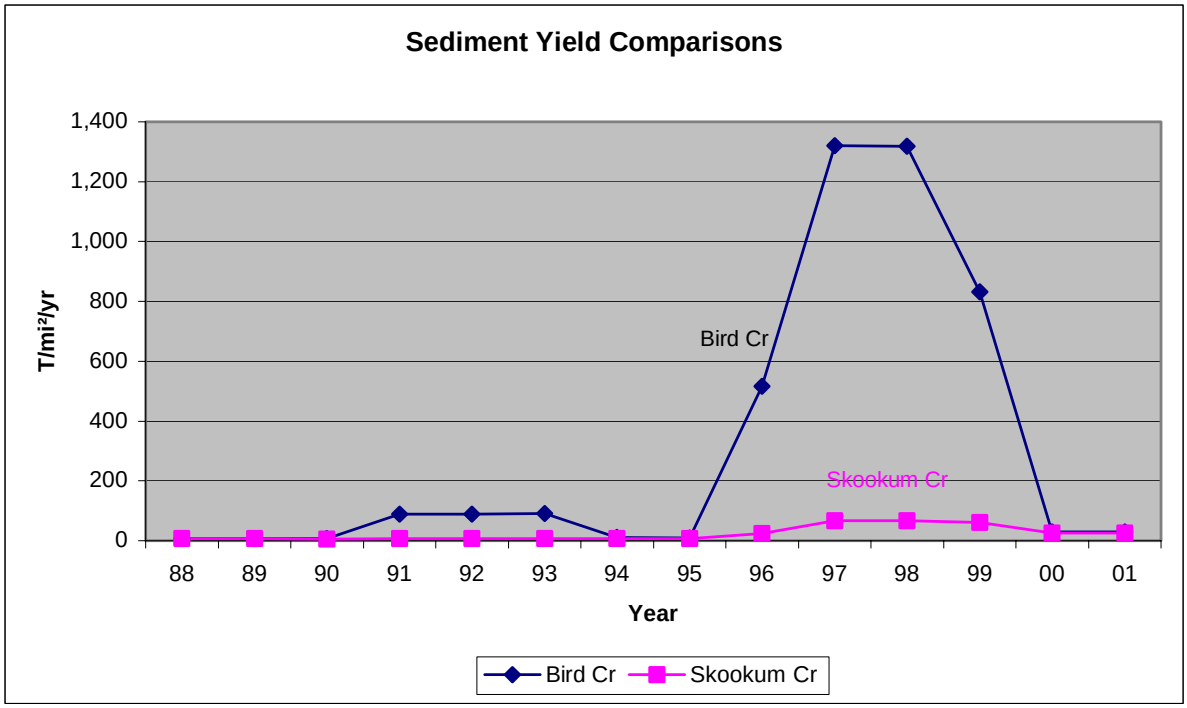
Table 12. Skookum Creek Monitoring

Skookum Creek			Drainiage Area =		11.1	miles²
Skookum Creek	Sediment Load		Stream Discharge (Q)			
Water Year	annual TOTAL (T/yr)	3-year running mean (T/yr)	mean daily (cfs)	peak day (cfs)	PEAK monthly (cfs)	PEAK duration (days)
88	48	79	18	154	78	51
89	94	74	27	193	124	38
90	68	70	31	190	86	73
91	103	89	42	285	142	41
92	63	78	21	158	94	31
93	104	90	27	272	139	28
94	54	74	17	182	89	26
95	97	85	29	345	86	57
96	678	276	41	507	114	57
97	1,482	752	45	727	232	31
98	76	745	24	200	106	31
99	510	689	34	375	154	26
00	296	294	36	322	152	54
01	76	294	20	217	114	27

Water Year	annual TOTAL (T/mi²/yr)	3-year running mean (T/mi²/yr)	mean daily (cfsm)	peak day (cfsm)	PEAK monthly (cfsm)	PEAK duration (days)
88	4	7	1.6	14	7.0	51
89	8	7	2.4	17	11.2	38
90	6	6	2.8	17	7.8	73
91	9	8	3.7	26	12.8	41
92	6	7	1.9	14	8.5	31
93	9	8	2.4	24	12.5	28
94	5	7	1.6	16	8.0	26
95	9	8	2.6	31	7.7	57
96	61	25	3.7	46	10.2	57
97	134	68	4.1	65	20.9	31
98	7	67	2.2	18	9.6	31
99	46	62	3.1	34	13.9	26
00	27	26	3.3	29	13.7	54
01	7	26	1.8	20	10.2	27

Comparing the measured streamflow and sediment loading response in Bird Creek (an intensively developed watershed) and Skookum Creek (an essentially undeveloped watershed immediately to the west of Bird Creek); it is apparent that:

- Skookum Creek produces greater peaking flows per unit area than does Bird Creek, even during extreme events; and
- Bird Creek moves far more sediment under similar climatic regimes, especially during and following years exhibiting infrequent (large flood periods) events such as 1996 and 1997.



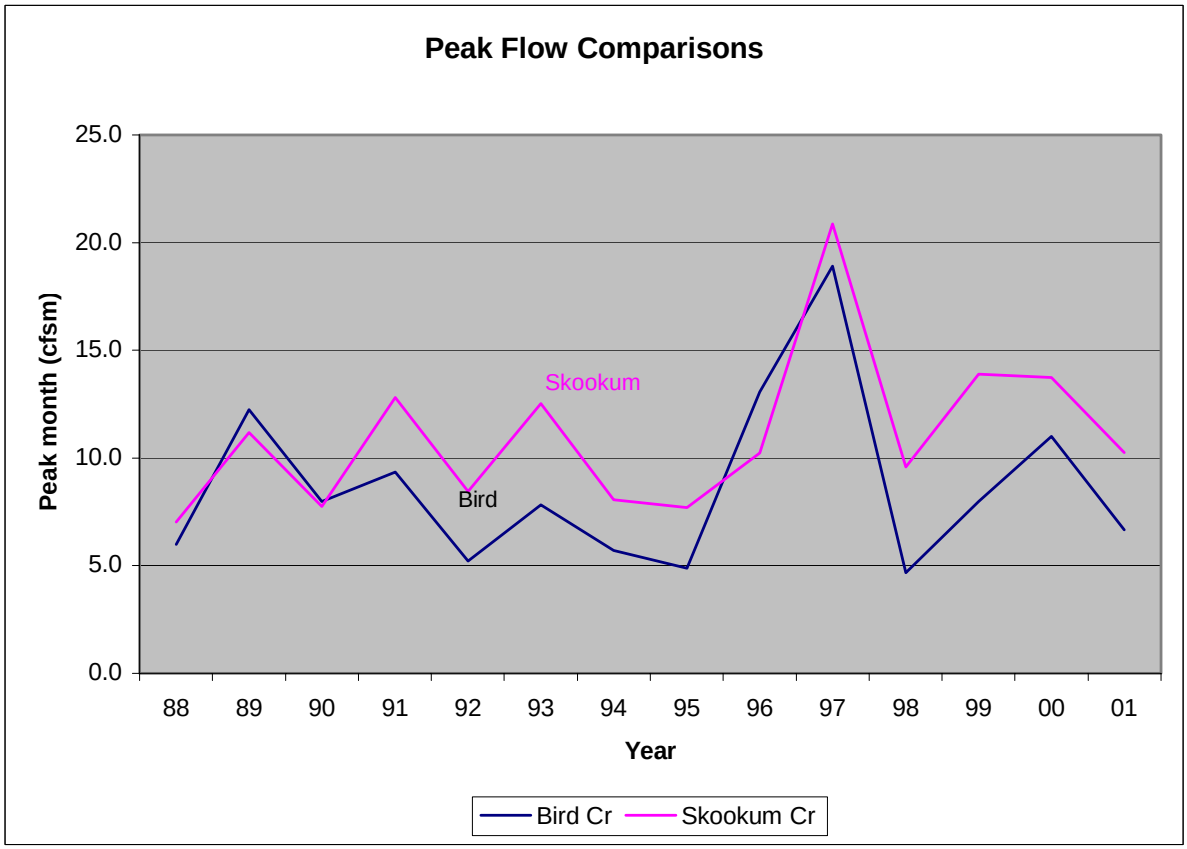


Figure 5. Sediment Yield and Peak Flow Comparisons

Table 13. Best Management Practices Monitoring (next page)

Project Location	Summary of Activities	Summary of Findings
Central Zone Brett Creek Rehabilitation	**Implementation/Effectiveness**: Public works contract implemented restoration work on a total of 12.48 miles on 12 different roads. 40 stream crossings restored and 2.61 miles of road recontoured.	Automated sediment samplers were installed both upstream and downstream of a restored channel site. Turbidity levels were compared between the upstream and downstream sites. Despite a small rise in turbidity after restoration activities (4.2 NTU), turbidity levels were well within the maximum level of 25 NTU established by the State of Idaho.
Central Zone Crinkle Cut Rehabilitation	**Implementation:** Public works contract implemented restoration work on 8.14 miles of 12 different roads. 6.19 miles of road were recontoured. 28 water bars were installed; roads that had only the stream crossings restored were closed with a 200 ft. front-end obliteration.	Project was found to be implemented as designed.
Central Zone Kings Ridge Rehabilitation	**Implementation:** Public works contract was started at the end of 2000 field season. Restoration work was implemented on 7.59 miles of 5 different roads. .74 miles of road was recontoured, 13 stream channel crossings were restored to natural conditions. A drivable ford was constructed on the Lake Gulch Road to decrease sediment risk while maintaining access to mining claims. 48 water bars were constructed.	Project was found to implemented as designed.
Central Zone Tepee Wetlands Restoration	**Implementation:** Project involved construction of approximately 3 acres of wetlands where fill and wood was hauled in to re-establish the wetland. Native seed mix was used to seed all disturbed areas. The wetland itself will be planted with wetland species in 2002.	Project was found to be implemented as designed.
Central Zone Tepee Creek Restoration Project	**Effectiveness:** Entire restoration area was surveyed several times during the spring runoff period of 2002.	It was observed that the constructed channel was functioning very well with the exception of 2 meander bends. Erosion was occurring because of improper design. Repairs were made at these 2 meanders with the Tepee Tweak project. Additional trees and shrubs were planted along stream banks during the spring of 2001 to prevent bank erosion.

Project Location	Summary of Activities	Summary of Findings
Central Zone Tepee Tweak Pool Restoration Project	**Effectiveness:** Entire project was surveyed several times during the spring runoff period of 2001. Some minor erosion problems were evident from spring runoff, which consisted of water topping over some pools, meander bends constructed too low, meander bend truncation from attempts to preserve vegetation on the flood plain, J-hook veins creating undesirable scour.	Repairs and modifications were made to the pool areas where the damage occurred.
South Zone St. Joe District Bird-Eagle Road Obliteration and Culvert Removal	**Effectiveness:** 50 miles of roads and associated stream crossings were obliterated and restored in 2000 and 2001.	Stream channels at 4 culvert removal sites appeared to be stable, with boulder and wood gradient control structures in place. Recontouring achieved restoration of natural slopes. Sapling trees, grasses, ferns, forbs, and mosses were observed to be recolonizing recontoured surfaces and stream banks.
South Zone Bird Creek Bridge Replacement	**Implementation:** Temporary bridge was replaced with a permanent buttressed concrete bridge in 2001.	Riprap buttresses under the bridge left a channel width transitional between upstream and downstream channel geometry. Mulching and seeding in disturbed areas was as specified. Ditch drainage and sediment structures were as specified.
South Zone Turner Creek Dam Removal and Channel Restoration	**Implementation:** Concrete water-supply dam and accumulated sediment was removed and channel restored in 2001.	Channel gradient was restored as specified. Step structures were created using large wood and boulders as specified.
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.	5 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 as specified.

Project Location	Summary of Activities	Summary of Findings
South Zone Get Shorty Timber Sale Units 80 & 81	**Effectiveness:** Best Management Practices were checked during operations and after completion when the ground was free of snow. Harvesting in Units 80 & 81 was completed during the winter of 2001 through the use of a processor, an excavator cable set-up and a forwarder. A small segment (300 ft.) of temporary road was constructed. The processor operated on a slash mat and snow cover throughout the harvest units. The temporary road was re-contoured, seeded and covered with slash. The forwarder trail was de-compacted and seeded and where slash was available it was used to cover the trail.	There was no evidence of erosion or exposed soil within the units. No evidence of erosion on the recontoured temp road or forwarder trail was observed. BMPs were implemented and were effective. A 100-foot buffer to the stream channel was in place and no entry or harvesting occurred here.
South Zone Stream crossing restorations in the Clarkia Woods Timber Sale	**Effectiveness:** Channel stability at restoration sites. Two stream crossings were rehabilitated through culvert removal and slope re-contouring about four years ago.	These sites are well vegetated and the channels are stable – no head cutting or degradation. Adjacent to one crossing rehabilitation location where the road was not recontoured in a small area (15 ft. long by 3 feet high) of cut slope slumping was observed. The displacement is about one foot. This area has moderate vegetative cover (75%). No evidence of soil movement to the channel was observed.

Project Location	Summary of Activities	Summary of Findings
South Zone Rocket Run and In-Between Timber Sales	**Effectiveness** of Best Management Practices - The In-Between TS unit was monitored in the fall and the Rocket Run unit in the summer of 2001. The In-Between unit was cable and skidder harvested and jackpot burned.	This unit has a large amount of residual woody material on site for nutrient cycling. Soils have a cover of organic matter. Skid trails and the temp road are well vegetated. The Rocket Run unit was cable harvested with large slash piles just below the road. These piles will be burned but no broadcast burning is planned. Residual woody material will be left for soil nutrient cycling. No evidence of soil movement or erosion was observed in these units.
South Zone Slate Creek, Big Creek and Marble Creek.	**Effectiveness:** Spring prescription burns - Prescription units in the Slate Creek drainage were burned in the spring of 1999, Big Creek in 2000 and the Marble Creek unit in 1999. Aspects of the burn units were southeast, south, and west.	Observations from inspecting the burn sites: fire was of low intensity; fire burned only portions of units – kind of "patchy" coverage; fire did not affect riparian areas and did not enter riparian areas; tree clusters, seedlings and saplings were present; some areas of unburned brush remained; new shoots were up to 3 feet tall on burned shrubs; ceanothus was alive and growing throughout the units; units were of variable size and shape; dead brush stems, killed by the prescribed fire, were visible throughout the burn units and are evidence of the low intensity burning. These stems ranged from about 0.25 to 1.5 inch diameter. The organic layer was not burned, except possibly in the Marble Creek unit where duff was found only in some areas (est. 10%), which may be a result of the intense 1910 fire. No surface erosion or soil movement was observed in any unit.

Project Location	Summary of Activities	Summary of Findings
North Zone Road 312 Closure and Relocation Monitoring Priest Lake District	**Effectiveness:** Road was obliterated in 2000 under the direction of the Douglas fir Beetle EIS. Originally, road was going to be completely removed from the floodplain. However, the zone hydrologist modified the original prescription. Under the revised prescription, the top 6-8 inches of road were removed, 5 pipes were removed and additional drainages were cut through the old road to connect existing wetland to the main stem of the Upper West Branch Priest River. Approximately half of exposed surface was hydro seeded at time of disturbance. The other half was hand seeded in November when there was snow on the ground. Slash was scattered along entire road to prevent motorized access.	Road was surveyed the following year. Seed that was spread on snow did not take hold like seed that was spread during the summer when soil was exposed. Sites where culverts were removed looked well overall with no additional down cutting. Stream channel connecting the wetland to main channel looked very stable, re-vegetating, with no major down cutting. 50 cedars planted the previous spring had marginal success, likely due to the fact that residual road fill was not ripped and therefore the compacted material was not conducive to tree survival.
North Zone **Road 416 Closure and Relocation Monitoring** Priest Lake District	**Effectiveness:** Forest Service and US Army Corps of Engineers worked cooperatively to obliterate and relocate road. Project included deep ripping and partial re-contouring the original roadbed and new construction and stabilization of an alternate route. Contractor was required to use sash, grass seed, fertilizer, straw mulch and non-merchantable slash to stabilize site and encourage re-vegetation. 50 cedar trees were planted along the riparian zone of Quartz Creek.	Site was surveyed in 2001. Grass growth was thick and ranged from 1.5 to 3 feet high. The cedars were also still alive. Site did not show any active erosion. This was attributable to successful use of grass seed, mulch and slash along the disturbed sites in the riparian zone and along new construction.

Project Location	Summary of Activities	Summary of Findings
North Zone **Closure Monitoring of Roads 1382D, 311 and 1104** Priest Lake District	**Effectiveness:** Road 1382 – This was first road obliterated by the district in 1991 under the South Fork Gold KV Plan. Site has been reviewed fairly since completion. Road was obliterated with a mix of full to partial re-contouring. Channels were stabilized with mulch mats and with no mats at all. All of road was seeded, fertilized and mulched with straw. Site was planted 3 years after obliteration. Roads 311 and 1104 – Portions of roads were obliterated using 10% dollars.	Road 1382 was re-surveyed in 2001. Re-contoured slopes were well grassed, planted trees were up to 5 feet tall and planted willows were well established. Lessons learned from project is that it appears that there is little difference in stabilization between streams that were matted and those not matted at all. Use grass over entire length of disturbed soils to prevent erosion and inhibit invasion of noxious weeds, plant conifers with grass seed on slopes to discourage competition, a blend of partial and full re-contouring works very well on roads constructed on glacial tills to allow dispersion of water across the slope. Roads 311 and 1104 were surveyed in 1999 and again in 2001. Photo documentation shows that grasses are well established near crossings and streams are stable. Grass coverage is sparse between crossings. Alders are re-establishing, road was not planted after obliteration. Some crossings should have been pulled more deeply and more slash should have been used as mulch. Heavier grass, fertilizer and mulch should have been applied between stream crossings.

Project Location	Summary of Activities	Summary of Findings
North Zone **Road Maintenance and Improvements Monitoring behind Barriers** Priest Lake District	**Implementation**: Kalispell Granite Grizzly Bear Management Access Plan was completed in 1994. Roads on district were proposed for closure through obliteration and others closed with guardrails and gates. It has been 5 years since last of KGB roadwork was done. Road 1013 was used to connect Priest Lake and Bonners Ferry Districts. Upper 7 miles was closed to all but administrative use. District hydrologist, Zone Fisheries Biologist, Wildlife Biologist, District Ranger and engineers conducted field review of Road 1013 in Fall of 2001.	Some of the roads in the KGB unit are in such poor condition that aquatic resources are threatened. Large failure on Road 1013 is attributed to long - term lack of regular road maintenance. Lessons learned: District needs to improve road maintenance behind barriers.
North Zone Fedar Creek Slide Stabilization Priest Lake District	**Effectiveness:** In November 2000, a slide that occurred in 1988 was surveyed. Slide originated from Road 1340 and deposited into Fedar Creek. Purpose of survey was to document stream's response to the slide and to evaluate the current status of the slide.	Large pieces of debris that was moved by the slide were acting as sediment traps. Slide was naturally re-vegetating with a mix of conifers, some of them 4 to 5 feet tall. Slide itself was looking stable and appears to be healing naturally. Lessons learned: Often slides will stabilize adequately without interference or assistance from well-intentioned human efforts.
North Zone Road Closures and Improvements funded by the Knutsen-Vandenberg (KV) Act, Twelve-Mile and Castro Timber Sales Priest Lake District	**Effectiveness:** Twelve-Mile Timber Sale – Water bars were installed ion Road 291B in 2000 and surveyed in 2001. Castro Timber Sale – District closed several roads in 1996 and 1998 and surveyed in 2001.	Water bars in the Twelve-Mile Timber Sale had improved the situation and that surface erosion was minimized. There could have been additional seeding and mulching on disturbed sites. Earthen barriers blocking most of roads in Castro Timber Sale are being actively breached but damage is minimal. Water bars were not installed properly on some roads. Seeding and fertilization efforts were successful. Some roads closed in 1996 were only earthen barriered with culverts left in place. Need to work with staff that is responsible for water bar installation. Grass seeding appears to slow the spread of noxious weeds.

Project Location	Summary of Activities	Summary of Findings
North Zone **KV Monitoring Road Construction and Re-construction,** Trout-Fisher Project Bonners Ferry District	**Effectiveness:** Objectives to assess effectiveness of stabilization of new road prism and road re-construction that was accomplished through seeding the cut slopes and road surface and constructing water bars. Ocular field review was accomplished by hydrologic tech. And engineering tech. 10/01.	Some roads were decommissioned in 1997 and 1999. Most work was successful, with the exception of one road (2551) that showed crack and fill problems and very steep slopes with the potential for road failure and landslides being very high. An attempt was made to temporarily fix problem but weather conditions made road dangerous for an excavator. Roads still have the potential for failures where drainage structures have not been removed and the slopes re-contoured. Armored drivable dips need to be constructed that tie into ditch lines and placed down the road of culverts with higher risks. Future monitoring of these roads will be necessary due to lack of maintenance behind gates and barricades.
North Zone **Cochran's Draw Rehabilitation Project** Sandpoint District	**Effectiveness:** Objectives of monitoring is to evaluate condition of decommissioned roads over time. Cochran's Draw was decommissioned in 1996. Items of interest are risk for mass failures, condition of past failures, the comparison between bucket versus cat-ripped road surfaces, and the invasion of noxious weeds.	**1st crossing** – fill was not pulled back far enough on left bank, high probability that high flow will cut into fill. **2nd crossing** – gabion in seep next to crossing functioning well, no signs of failure or re-routing. Large water bar diverts surface flow from cutting into large fill and into stream. **3rd crossing** – gabion seep is well established, stabilizing the slope and permitting flow. **4th crossing** – fill on left bank with steep slope may fail from high flows. Jute fiber on right bank has stabilized bank allowing good vegetation establishment.
North Zone **Grouse Creek Photo Monitoring Project** Sandpoint District	**Baseline:** Project was initiated in 1997 prior to large stream enhancement project. 7 photo points were established to capture upstream, cross-channel and downstream views. 4 new photo points were added in 2001 with the intent of documenting existing conditions below sites.	A stream enhancement project is proposed for the summer of 2002 and the new photos will be useful in documenting changes in the channel. The existing photos have proven to be useful for determining the extent of channel changes and for effectiveness of enhancement projects.

Forest Plan Monitoring Item H-1: Threatened and Endangered 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 surveys were conducted during the field seasons of 2000 and 2001 to validate predicted habitat and search for populations. No populations of Spalding's catchfly have been found to date on the Idaho Panhandle. Biological Assessments currently are addressing Spalding's catchfly as a threatened species following requirements in the Endangered Species Act and Forest Service Policy.

Sensitive Species: In March of 1999 the regional sensitive species list was updated, following the Region 1 Species-at-Risk Protocol. The new list contains 64 species listed as 'Sensitive' by the USFS. The Idaho Conservation Data Center 'tracks' a larger list of rare vascular and non-vascular plants in the State, of which the USFS sensitive list is a subset. Currently, the ICDC lists 94 vascular plants and 16 non-vascular plants (lichens, mosses and liverworts) for the IPNF. Generally, the USFS sensitive list contains the species most at risk on federal lands. The additional 46 species on the ICDC list can be thought of as 'species of concern'; plants that are rare at the state scale, but for which there either are: a) few identifiable threats, b) some large, secure populations, or c) no occurrences are known for federal lands. The Species-at-Risk Protocol allows forests to also develop a "Forest Species of Concern List" to address some of these rare species for which there may be local concern. While no biological evaluations are prepared for these 'rare' plants 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 a project, is surveyed to determine the presence of rare plant species. Protection measures are implemented to maintain population and species viability following the National Forest Management Act and Forest Service policy. In 2001, forest botany personnel performed on-the-ground clearance surveys on 4,277 acres of high potential habitats for TES and rare plants in support of various projects including timber, watershed, fisheries, KV, trails, grazing, special use, and land exchange projects. This also includes a small amount of landscape level surveys not associated with any project. These landscape level surveys are especially important to understanding the distribution of species as they generally occur in remote areas that have a very high potential to support populations (e.g. old growth cedar groves, remote peatlands, Research Natural Areas). Often these areas are ones that likely will not have projects in the future that would require surveys.

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

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 2001, surveys occurred on 68,254 acres of federal lands with the express purpose of documenting and protecting rare plant populations from management activities and mitigating potential adverse effects. In 2001, 4,277 acres were surveyed for sensitive and rare plants, a slight decrease from 2000. Recent estimates of sensitive plant habitat (from IPNF Geographic Assessments) have determined that approximately 625,000 acres (~25%) of the total land base of the IPNF has the potential to support sensitive plant species in a wide array of plant communities. To date, about 10 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 2001), which is the repository of all information relating to rare species in the State. The information below includes some sightings on non-federal lands. However, the vast majority of observations come from lands under federal management. Sightings on adjacent private lands are important in understanding the distribution of occurrences in the ecosystem as a whole. However, there are no laws governing rare plants on non-federal lands in the State of Idaho; subsequently few surveys have occurred on non-federal lands and observations have generally been incidental discoveries. Between 1892 and 1987 there were 119 observations documented for rare plants in the 5 northern counties, federal and non-federal lands. Since 1988, botanists and other personnel from the USFS, the Bureau of Land Management, and the Idaho Conservation Data Center have documented over 796 occurrences, for 80 rare species, mostly on federal lands. In 2001 there were 35 element occurrences reported for the five northern counties.

There were several notable discoveries of rare plants on the Forest in 2001 by IPNF personnel and others. The discoveries included fifteen different sensitive plant species and six other rare plant species. Three of those occurrences, the lichen *Pilophorous clavatus* and the mosses *Ulota megalospora* and *Grimmia brittoniae,* are the first documented occurrences in the state of Idaho.

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 2001 monitoring plots for three sensitive species - Howell's gumweed (*Grindelia howellii*), clustered lady's slipper (*Cypripedium fasciculatum*), and deerfern (*Blechnum spicant*) – 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 14.

Table 14. *Grindelia howellii* summaries, 1995-2001

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

*(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. Regression analysis, based on trends from the other two plots, predicts that 1998 numbers for plot 3 would be about 431 plants. The trend from 2000 to 2001 is an

increase in total plants from 219 to 254. Plot 1 went from 55 to 71, and Plot 2 went from 156 to 112. All the plots have had the same type of cyclic trends, likely a response to the same environmental stimuli: precipitation, snow-pack, etc. Though the 7-year trend is down, there was a slight increase in total plants on Plots 1 and 3 in 2001. Concern for this species remains high and monitoring will continue in 2002. 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 harvest is planned for removal in 2002. A + denotes that additional seed heads had been grazed off.

Table 15. *Cypripedium fasciculatum* monitoring plots, 2000-2001

2000

Control	**# flwring**	**#non-flwring**	**#flwrs**	**Total Plants**
1	7	3	19	10
2	8	12	16	20
3	14	15	7+	29

Thin	**# flwring**	**#non-flwring**	**#flwrs**	**Total Plants**
1	10	22	21	32
2	15	15	20+	30
3	4	3	13+	7

2001

Control	**# flwring**	**#non-flwring**	**#flwrs**	**Total Plants**
1	8	1	11	9
2	8	8	12	16
3	no data	-	-	-

Thin	**# flwring**	**#non-flwring**	**#flwrs**	**Total Plants**
1	8	13	13	21
2	8	13	13	21
3	5	1	11	6

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

Also in 2001, formal monitoring of a population of deerfern (*Blechnum spicant*) was conducted on the Priest Lake Ranger District. Seven permanent plots that were established in 1991 had been previously sampled in 1994 and 1997. These plots encompass a single, large linear population of deerfern along a small intermittent stream.

Two separate regeneration harvests of the surrounding late successional forests were done in the late 1980s, prior to listing of this species as “sensitive”. Plots were established the year after the activity was completed. One of the plots is in an undisturbed portion of old growth western hemlock (plot 2) and serves as a control plot. Three plots area located at the edge of the harvest unit (plots 1, 3 and 7) - they experienced a change in light regime (more light) but little ground disturbance.

Three plots are in the harvest unit (plots 4, 5 and 6); the plants in these plots experienced a change in light regime and ground disturbance. Plot 4 does have a little shade from some residual western hemlock saplings, and plots 5 and 6 are in full sun.

A summary of the 1991, 1994, 1997 and 2001 sampling results is in Table 16.

Table 16. *Bechnum spicant* monitoring plots, 1991-2001

Plot	Year	Juvenile	Juvenile flwr	Vegetative adults	Flwrg adults	Flwrg plus	Total	Yr to Yr Change
1 - E	**1991**	17	0	101	0	0	118	n/a
	1994	44	0	120	11	0	175	+50
	1997	93	0	165	3	0	261	+86
	2001	57	1	67	0	0	125	-136
Total	**Change**	**+40**	**+1**	**-34**	**0**	**0**	**+7**	
2 - U	**1991**	5	0	15	2	1	23	n/a
	1994	4	0	14	4	0	22	-1
	1997	4	0	23	0	0	27	+5
	2001	1	0	20	0	0	21	-6
Total	**Change**	**-4**	**0**	**+5**	**-2**	**-1**	**-2**	
3 - E	**1991**	6	0	43	20	0	69	n/a
	1994	8	6	22	24	0	60	-9
	1997	28	7	66	1	0	102	+42
	2001	15	6	55	6	0	82	-20
Total	**Change**	**+9**	**+6**	**+12**	**-14**	**0**	**+13**	
4 - D	**1991**	2	0	11	11	11	35	n/a
	1994	12	0	13	16	1	42	+7
	1997	9	0	46	1	0	56	+14
	2001	8	1	31	14	0	54	-2
Total	**Change**	**+6**	**+1**	**+20**	**+3**	**-11**	**+19**	
5 - D	**1991**	0	0	3	1	2	6	n/a
	1994	15	0	0	1	3	19	+13
	1997	5	0	6	5	2	18	-1
	2001	0	0	2	1	3	6	-12
Total	**Change**	**0**	**0**	**-1**	**0**	**+1**	**0**	

Plot	Year	Juvenile	Juvenile flwr	Vegetative adults	Flwrg adults	Flwrg plus	Total	Yr to Yr Change
6 - D	**1991**	10	8	2	13	25	58	n/a
	1994	13	1	36	24	4	78	+20
	1997	64	2	49	12	3	130	+52
	2001	43	12	20	17	0	92	-38
Total	**Change**	**+33**	**+4**	**+18**	**+4**	**-25**	**+34**	
7 - E	**1991**	6	0	2	7	37	52	n/a
	1994	20	0	31	14	8	73	+21
	1997	37	0	53	15	3	108	+35
	2001	25	0	48	34	2	112	+4
Total	**Change**	**+19**	**0**	**+46**	**+27**	**-35**	**+60**	

U = Undisturbed

E = Edge Plot

D = Disturbed

Year to year change is measured from the preceding sample. Total change between first sample and last is shown in bold type.

The undisturbed plot showed an overall decrease in number of individuals from 1997, and number of individuals was slightly lower in 2001 than in 1991. Plots either in or on the edge of disturbed areas showed an overall increase in number of individuals since 1991, with a large increase in 1997 and a subsequent decrease in 2001.

The monitoring of this deerfern population was initially designed as a ten-year project. It has been determined that further monitoring of the populations may provide valuable information on population response to the recovery of the disturbed areas over a longer period. The next scheduled sample of the permanent plots is in 2004.

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

Forest Plan Monitoring Item I-1: Minerals

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

Background

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

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

Monitoring Data

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

Total Non-Bonded Non-Energy Operations Processed - 2,251 (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 - 7

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 - 32

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 - 32 (This includes the twenty-four operations on which surface disturbance has occurred and nine where it has not.)

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

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

Background

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

Region 1 soil quality standards state that detrimental soil conditions should not exceed 15 percent of an activity area.

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 100 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).

Monitoring Data

This years monitoring focused on grazing allotments, prescribed fire, and tractor logged units in a salvage sale area:

1) Four grazing allotments were monitored and they were as follows: Iron Mokins – North Fork; Searchlight – Alder; and Ferguson Grazing Allotments on the Coeur d' Alene River District and the Charlie Grazing Allotment on the St. Joe District.

According to the Region One Supplement 2500-99-1 an Activity Area is a land area affected by a management activity to which soil quality standards are applied. Activity areas must be feasible to monitor and include grazing areas or pastures within range allotments. My monitoring approach was to monitor the obvious areas where cattle concentrate.

The Iron Mokins – North Fork Grazing Allotment is approximately 46,720 acres. Most of the grazing pressure occurs in the grassy/timbered bottoms of the drainages, with little to no evidence of grazing or bedding on the immediate adjacent slopes. I considered the broader bottoms of the major drainages as the grazing area (there are no established grazing pastures in this allotment). This grazing area amounted to about 600 acres and the monitoring of this area resulted in 5 percent of the area being detrimentally compacted. None of the monitored grazing area had recent logging. I found very little to no evidence of grazing in past harvest units within the grazing allotment. Evidence of grazing that does occur outside of the bottoms tend to be on existing roads, which would not increase the detrimental affect in existing harvest units on this allotment. The cattle graze on the road prism vegetation and I found no decrease in vegetative ground cover, which would produce increased erosion as a result of the cattle grazing.

The Searchlight Marie – Alder Grazing Allotment is approximately 14,720 acres. I created and monitored two grazing areas, because defined grazing pastures do not occur in this allotment.

The first grazing area monitored was a grassy/timbered bottom at the lower end of Marie Creek and the monitoring of this area resulted in 4 percent of the area being detrimentally compacted.

The second grazing area monitored consisted of an upland area in Alder Creek (Sections 36, 25 and 26; T50N, R2W), which had evidence of grazing. I put in 8 transects and collected 80 samples in both past harvest units and on un-harvested ridges. None of the

80 samples were detrimentally compacted. All cattle movement occurred on existing road systems, which are already considered 100 percent impacted. Cattle grazing in this area did not contribute additional impacts to existing harvest or non harvest units.

The Ferguson Grazing Allotment is a pasture type system. On the upper pasture detrimental compaction was 13 percent and the lower pasture had 10 percent compaction.

The Charlie Creek Grazing Allotment consists of Hume Creek and Charlie Creek and is approximately 15,790 acres. The total concentrated grazing area is about 400 acres.

Most of the grazing pressure within Hume Creek occurs in the grassy/timbered bottoms of the drainages, with scattered evidence of grazing or bedding on the adjacent low relief slopes. I considered the broader bottoms of the major drainage and some of the adjacent slopes that had cattle trails as the grazing area and the monitored detrimental compaction in this area amounted to 6 percent. Little of the monitored grazing area had evidence of recent mechanized logging. Evidence of grazing that does exist outside of the bottoms and adjacent low relief slopes tends to be mostly on existing roads, which would not increase the detrimental affect in existing harvest units on this allotment. The harvest unit that had evidence of cattle grazing is near the cattle guard where the exclosure exists and this unit was included in my monitoring transects. The cattle do graze on the road prism vegetation in places, but I found no decrease in vegetative ground cover, which would produce increased erosion as a result of the cattle grazing. The stream banks in Hume Creek are well vegetated and stable.

Most of the grazing pressure within Charlie Creek occurs in the grassy/timbered bottoms of the drainages, with little to no evidence of grazing or bedding on the immediate adjacent slopes. I considered the broader bottoms of the major drainages as the grazing area and the detrimental compaction in these areas amounted to 5 percent. The stream banks in Charlie and Hume Creeks are well vegetated and stable.

In all the grazing allotments, the areas that contributed most to the detrimentally compacted figure were the cattle use areas within the timbered sites. The grass dominated areas have dense root systems which cushion the effects of compaction. Within the grass dominated areas the detrimental compaction was basically limited to the highly used cattle trails.

All grazing areas monitored meet Regional and Forest soil quality standards. Cattle grazing, on the monitored allotments add little to no effect to existing harvest units from a detrimental soil impact standpoint.

2) Seven prescribed burn units were monitored, which included five on the north zone and two on the south zone. Unit 15 on the Packsaddle Timber Sale (Sandpoint) and units 82 and 84 on the Get Shorty Timber Sale (St. Maries) were burned in the spring and no detrimental impacts occurred as a result of these burns. Units 82 and one of the group areas within Unit 84 on the Get Shorty Timber Sale did not meet the 17 to 33 tons per acre of large woody debris. Units 14, 3, and 6 on the Packsaddle Timber Sale

(Sandpoint) and unit 47 on the Katka Timber Sale (Bonners Ferry) were fall burned. Units 14, 3 and 6 had small isolated areas of severe burn, the total area of severe burn on these three units ranged between 1 and 3 percent.

Unit 47 on the Katka Timber Sale area was on a dry southwest facing aspect and burned quite hot. 35 percent of this unit was severely burned. A severe burn is when all surface organic layers were burned off and the organic matter, in the surface mineral soil layer is consumed. Roots in the surface mineral soil layer are charred and dead. One year after the burn, 22 percent of this unit still had hydrophobic, surface soil conditions. The recommended amount of large woody debis that should be left in this unit is 7 to 14 tons per acre. The actual amount remaining after the burn was 6 tons per acre. Three of the seven prescribed burn units did not meet soil quality standards from a large woody debris standpoint and one unit exceeded soil quality standards in that more than 15 percent of an activity area was detrimentally burned.

3) A tractor logged, pile landing and lop and scatter operation on Units 2 and 3 of the Along Haul Salvage Sale was monitored on the Bonners Ferry Ranger District.

Unit 2 had 12 percent and Unit 3 had 14 percent detrimental compaction. These units meet Regional and Forest Plan soil quality standards from a soil compaction and displacement standpoint.

The Along Haul Salvage Sale Units also met the fine organic matter guidelines but was low on the coarse woody debris guidelines.
The recommended range of coarse woody debris for these units is between 7 to 13 tons per acre. Transects on these units indicated 5 tons per acre on Unit 2 and 4 tons per acre on Unit 3

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, elk habitat, bats, snags, flammulated owls, northern goshawks, Harlequin ducks, bald eagles, black-backed 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, 1992-2001

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

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

- Approximately 2,980 acres were planted to these species in 2001. (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 1992-2001 there were 58,945 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 2001 the IPNF planted approximately 460,183 rust resistant white pine seedlings.

- From 1992 through 2001 the Forest planted over 10,482,083 rust resistant white pine seedlings.

The second part of our strategy involves maintaining a landscape-wide, naturally breeding, and genetically diverse population of wild white pine that can develop blister rust resistance through natural selection. We have cooperated with the U.S. Forest Service, Northern Region, Forest Health Protection Staff in publishing White Pine Leave Tree Guidelines (Schwandt and Zack, Forest Health protection Report 96-3, March 1996). The guidelines include pruning natural reproducing young white pine. 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 2001, the IPNF pruned approximately 2,853 acres where pine trees are a major portion of the forest.
- From 1992 through 2001, the Forest has pruned approximately 15,789 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

- 7,125 acres were thinned or released in FY 2001. Most of the thinning and release was to allow shade-intolerant larch, white pine, and ponderosa pine to maintain stand dominance, or to free over-crowded stands to grow freely.

- From FY 1992-2001, 66,495 acres were thinned or released.

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

- There were 3,040 acres of harvest related natural fuel reduction.

- There were 4,437 acres of hazardous fuel reduction.

5) Watershed Improvement

- 420 acres of watershed improvement were accomplished in FY 2001.

- From FY 1992 to 2001 there were 9,697 acres of watershed improvement.

6) Road obliteration/decommissioning

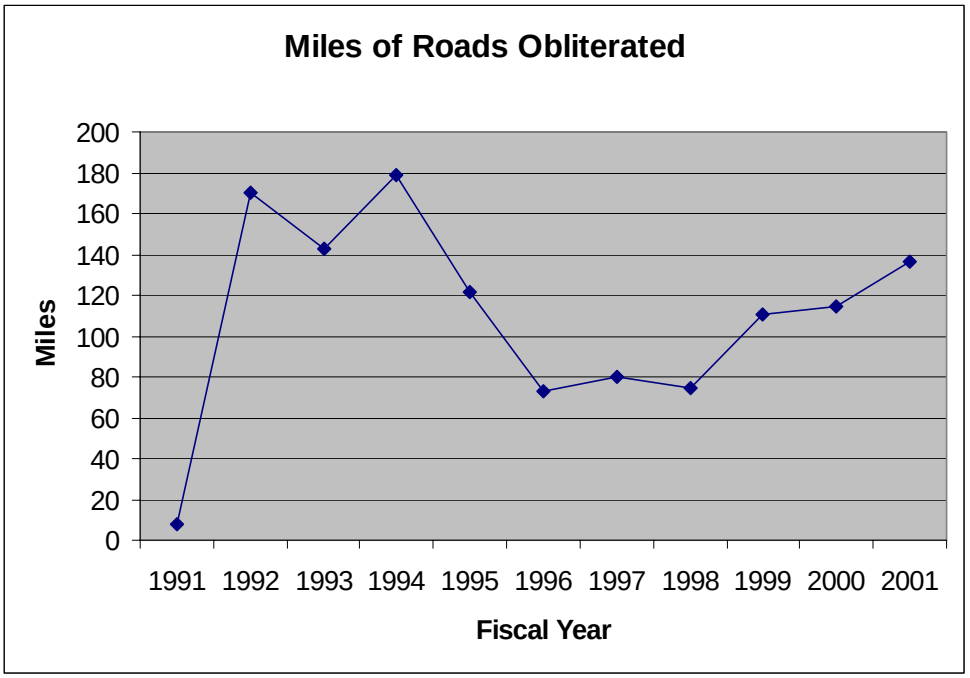
- There were 136.2 miles of road obliterated in FY 2001 as part of ecosystem restoration work, using a variety of funds.

- Table 17 shows that there were 1,210.7 miles of road obliteration on the IPNF from FY 1991-2001. System roads are generally the ones that are inventoried, maintained and managed by the forest. The other roads are not.

Table 17. Miles of Roads Obliterated

FISCAL YEAR	SYSTEM ROADS	OTHER ROADS	ALL
1991	0	8.0	8.0
1992	141.8	28.3	170.1
1993	115.2	27.6	142.8
1994	119.3	59.9	179.2
1995	95.9	25.7	121.6
1996	58.9	14.3	73.2
1997	79.2	1.1	80.3
1998	71.5	2.8	74.3
1999	51.9	58.3	110.2
2000	91.8	23.0	114.8
2001	107.0	29.2	136.2
TOTAL	**932.5**	**278.2**	**1,210.7**

Figure 6. Miles of Roads Obliterated



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

Standards in the 1987 Forest Plan call for maintaining "10% of the forested portion of the IPNF as old growth". The Forest Plan identified 2,310,000 forested acres on the IPNF. Therefore, the Forest Plan Standard requires maintaining 231,000 acres of old growth on the Forest. From 1990 through 1993 we did an intensive inventory of our old growth resources. Since that time, we have continued to update our old growth inventory as better inventory data became available, and as the forest changed in response to natural events. The information presented below represents our most up-to-date information as of the end of year 2001. Starting in 2001 and likely continuing through 2003 the Idaho Panhandle National Forest will be reviewing all its Old Growth data to be sure it reflects the most current conditions on the ground. We don't expect any major changes, but we are continually striving to increase the quality our information about this important element of our forest ecosystems. As a result of the first year of this review, there are a few changes in this report's old growth totals as compared to the previous years'. Final results from this review should be available in 2004.

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 were specifically identified and "retained" to meet the 231,000-acre forest plan standard, and "additional" identified old growth that serves old growth ecological functions, but is not subject to any special allocation.

"Existing Old Growth" fully meets all Northern Region old growth defining criteria. The "Ancient Cedar" category is 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 are dominated by trees over 5 feet in diameter and generally over 500 years old; they far exceed minimum old growth criteria.

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

Old growth totals are presented in Table 18. Forest Plan Standards call for us to maintain 231,000 acres of old growth (10% of our forested acres). We have identified and allocated 267,840 acres (11.6% of our forested acres) to be retained as old growth. We also have an additional 8,269 acres (0.4% of our forested acres) of field verified

unallocated old growth, which provides old growth habitat for wildlife and serves other ecological functions. Not showing in the table below are an additional 10,910 acres that have been aerial photo identified as possible old growth, but have not been field checked.

Table 18. Acres of Old Growth By River Sub-Basin

Sub-Basin (River)	Allocated Existing Old Growth	Allocated Ancient Cedar	Allocated Potential Old Growth	Total Allocated Old Growth	Additional Field Verified Old Growth	Total All Old Growth
St. Joe	58,259	384	13,496	**72,139**	8,096	**80,235**
Coeur d'Alene	56,273	0	3,847	**60,120**	0	**60,120**
Pend Oreille	19,629	63	5,027	**24,719**	0	**24,719**
Kootenai	63,613	516	4238	**65,689**	0	**65,689**
Priest	42,516	737	1920	**45,173**	173	**45,346**
Forest Total	**240,290**	**1,700**	**25,850**	**267,840**	**8,269**	**276,109**

Although most of the Idaho Panhandle National Forest is a moist forest environment, we do have some low elevation areas with dry forest habitat types (ponderosa pine and Douglas-fir habitat types, and the very driest grand fir habitat types). Although these dry areas represent less than 10% of our forested acres, they are quite important in terms of the 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. The 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 that otherwise could have increased 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, 65+ years of fire suppression has allowed in-growth of dense stands of smaller trees and accumulation of high woody fuel loads. The large number of trees in these denser stands creates higher moisture demands than in the historic, fire-maintained open stands. This higher moisture demand stresses the old growth trees during drought times, and predisposes stands to bark beetle outbreaks. During drought years this can result in unnaturally high levels of mortality amongst old trees in these unnaturally dense stands. In addition, the dense small trees can serve as fuel ladders that can carry flames into the upper canopy of large old trees. This new situation creates an unnaturally high risk of stand replacing fire that can kill the old growth trees 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.

On dry habitat type old growth, restoration or mimicking of historic disturbance processes is sometimes necessary to meet the Forest Plan standard of maintaining old growth. In those places where we find dry site old growth stands with an unnaturally elevated risk of bark beetles attack and elevated risk of stand replacing fire, we may look at restoration opportunities. In this cases the driving objectives will be maintenance of old growth characteristics, and restoration of historic old growth structures and processes.

Bald Eagles, Elk Habitat, Snags, Loons, Bats, Flammulated Owls, Northern Goshawks, Harlequin Ducks, and Black-backed Woodpeckers

Bald Eagle: The bald eagle is a federally listed threatened species. In the Priest Lake drainage, four bald eagle nest sites were monitored. These include the Upper Priest Lake, Bear Creek, Kalispell Island and Outlet Bay nest sites. The Lower Priest River nest site was not monitored this year. All monitored nests were occupied by breeding pairs this year and produced fledglings. The Upper Priest Lake, Bear Creek and Kalispell Island nest sites each produce one fledgling in 2001. The Outley Bay nest site produced two fledglings. The Robinson Lake bald eagle nest on the Bonners Ferry Ranger District was also active in 2001, but wasn't monitored beyond early June so we don't know how many fledglings it produced. The Monarchs nest was a new territory on Lake Pend Oreille; it fledged two eaglets. At Hayden Lake, bald eagle habitat continues to be lost to rapid urbanization off the national forest. A bald eagle nest tree on private property at Hayden Lake was cut down by the landowner; the remaining four known bald eagle nests in the Coeur d'Alene drainage are also off the national forest. Two of the nest territories are partially on the national forest.

The midwinter bald eagle count is a national survey which has been conducted annually since 1979. It is a cooperative effort of Idaho Dept. 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. Due to safety concerns, aerial surveys which are usually conducted by the Idaho Dept. of Fish and Game were discontinued in 2001. Therefore this year's surveys covered a smaller area than previous midwinter bald eagle surveys. Thirty-four bald eagles were counted during the survey, including 14 immature eagles. The results of the midwinter count are shown in the table below.

Table 19. Bald Eagle Midwinter Count

Midwinter bald eagle route	Eagles counted	Comments
Lake Coeur d'Alene	5	
Spokane River	2	
St. Joe River	3	
Priest Lake and Priest River	2	poor visibility due to fog and snow
Kootenai River	4	
Pend Oreille River	18	
Hayden Lake	0	poor visibility due to fog
TOTAL	**34**	

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 2000 on the St. Joe Ranger District (Avery and St. Maries). On the Coeur d'Alene River Ranger District (Wallace and Fernan), it decreased slightly but still meets the forest plan standard. This is primarily due to a moratorium on implementing the Douglas-fir beetle sales. Unfortunately, this also means that many of the road closures associated with these sales will not be accomplished as originally scheduled. The Central Zone wildlife department has been allocated some funds in 2002 to implement a portion of these road closures.

Table 20. Elk Habitat Potential

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

Snags: Snags (dead trees) are important habitat for dozens of wildlife species, including four sensitive species and two management indicator species. The Forest Plan standard varies between 1 and 1.3 snags/acre for different management areas. These standards were based on the available science almost twenty years ago. Since then, more comprehensive studies have determined that these snag density guidelines are too low to support viable populations of many species of snag-dependent birds over the long term.

In 2001, one study surveyed snags to determine how well our wildlife model based on timber stand data actually predicts habitats which are suitable for flammulated owls. The survey covered 668 acres of the Coeur d'Alene River, Sandpoint and Priest Lake Ranger Districts. **Results:** All snags greater than 12" in diameter were measured on 334 plots in 47 stands. The mean snag density was 6.5 snags/acre. Thirty-one habitat patches were large enough and had sufficient large-diameter snags to support flammulated owls. However, many habitat patches were too small to qualify as flammulated owl habitat. Because this survey targeted only Douglas-fir and ponderosa pine stands which were known to contain large-diameter trees, the results of this survey are **not** representative of snag distribution or abundance across the Idaho Panhandle National Forest.

Table 21. Results of Snag Survey

Tree species	**% of snags**	**Mean diameter (inches)**
Douglas-fir	64	21
ponderosa pine	11	21
grand fir	9	20
western white pine	5	20
other species	3	18
species unknown	8	20

Another snag survey on the Priest Lake Ranger District monitored 443 acres of snag habitat after timber harvest in the Tola, Binnarch, Flat Moores and Bismark Timber Sales. The Douglas-fir Bark Beetle Timber Sale EIS specified that 6 snags per acre would be retained in moist forest habitats, and 4 snags per acres in dry forest types. Higher levels were required in watersheds where past timber harvest or firewood cutting had already reduced snags. Project level monitoring as specified in the EIS revealed that snag retention standards were met on only 17 of the 27 units. Although neither the Forest Plan nor EIS specifies any height requirements for snags, only 8 of the 27 monitored units had snags over 40 feet tall. Snags shorter than 40 feet have limited value for some species of snag-dependent wildlife. Most pileated woodpecker nests are over 40 feet high (Bull et al. 1986, p. 5)

Loons: The common loon is a sensitive species. A nongame grant from Idaho Dept. of Fish and Game made it possible to monitor common loons on thirteen lakes between May and July, to assess where loons were nesting in North Idaho. Thirty volunteers helped with this monitoring project, including Avista Utilities and the North Idaho and Coeur d'Alene Chapters of the National Audubon Society. No nesting loons were found. Twelve loons were seen in 13 surveys on Lake Pend Oreille. Seven loons were seen during nine surveys on Priest Lake. Five loons were seen during five surveys on Upper Priest Lake. Five surveys of Bonner and Robinson Lakes found three loons on each lake. No loons were observed in 5 surveys each of Brush and Dawson Lakes, or 4 surveys of Perkins and Smith Lakes. Limited common loon surveys were conducted at Coeur d'Alene, Cave and Chatcolet Lakes, which are off the national forest. No loons were found on those lakes either. Recreation use and fluctuating lake levels associated with dams are believed to be the reasons loons did not nest on any of the thirteen lakes monitored in 2001.

Bats: For several years, the Idaho Panhandle National Forests have had an aggressive abandoned mine closure program. Mines are important habitat for at least nine species of bats in our area, including Townsend's big-eared bat, a sensitive species. To protect bat habitat when mines are closed for public safety, bat surveys are conducted. Generally each mine is visited one or two nights during the

summer to determine if the mine is used by bats. More intensive surveys or internal mine surveys would likely have documented more bat use of abandoned mines.

External bat surveys were conducted at sixteen mines shown in the table below – 2 that had been closed + 14 proposed for closure. Bats were found to be using 9 out of 16 (56%) of the mines surveyed. Bats were seen outside two other mines, but initial surveys did not detemine whether bats roost in those mines.

Table 22. Bat Surveys

Mine	**Bats using mine?**	**Comments**
Washington-Idaho Shaft	No	
Washington-Idaho Adit #1	Yes	
Two Mile Adit #1	No	closed with an earth plug in 2001
Two Mile Adit #2	No	closed with culvert and gate in 2001
Burnt Cabin	No	closed with an earth plug in 2001
Hidden Treasure #1	see comments	bats seen in area but not observed using mine. Closed with culvert and gate in 2001
Hidden Treasure #2	see comments	bats seen in area but not observed using mine.
Hidden Treasure #3	No	
Kilroy #1	Yes	
Kilroy #2	Yes	
Woodrat #7	Yes	
Woodrat #8	Yes	
Last Chance Adit	Yes	
Miller Adit #3	Yes	
Fourth of July	Yes	Bat gate installed before 2001
Sailor Boy	Yes	Bat gate installed before 2001

Eighteen adits and two shafts were closed on the forest in 2001. Bat gates were installed on ten of the twenty new mine closures. Three mine were closed with a culvert and a gate. This national forest has not monitored bat use at mines closed using culverts, but data from other states indicates culvert closures may deter bat use rather than enhancing bat habitat. Additional monitoring is needed to assess whether bats are using mines closed with culverts.

Flammulated Owls: The flammulated owl is a sensitive species on the Idaho Panhandle National Forests. Surveys for flammulated owls were conducted in portions of the proposed Douglas-fir Bark Beetle Timber Sales (Flat Moores, Pelke Galena, Ojibway Red II, and Quartz Jasper). Flammulated owl surveys used a combination of active and passive solicitation techniques to detect owls. Flammulated owls were heard at four locations. Nest searches were conducted at two of the locations, but failed to determine the exact location of the nest site.

Northern Goshawks: The goshawk is a sensitive species on the Idaho Panhandle National Forests. Approximately 2000 acres were surveyed on the Coeur d'Alene River Ranger District where goshawk nests had previously been identified or where goshawks had been sighted during the breeding period. No goshawks were found during the survey in Shoshone Creek. Two new breeding territories were located in the Colt Mountain and Little North Fork areas.

Harlequin Ducks: The harlequin duck is a sensitive species on the Idaho Panhandle National Forests. Harlequin duck surveys were conducted on Granite Creek, Gold Creek, Hughes Fork and the Upper Priest River. Surveys to detect adult harlequin ducks were conducted in May, and surveys to detect the presences of adult females with broods were conducted in July. During the adult surveys, 6 pairs, 7 lone drakes and 2 lone hens were observed. Brood surveys found only one female with 4 young on Granite Creek. No other broods were observed. The lack of detection of broods on the other stream and river segments surveys may be in part the result of survey timing and lack of detection of existing broods within survey areas.

Table 23. Harlequin Duck Surveys

Survey Area	Adult Survey		Brood survey	
Granite Creek	May 10	3 pairs/1 drake	July 30	1 female/4 young
Gold Creek	May 23	2 hens	July 25	None
Hughes Fork	May 22	2 pairs/ 3 drakes	July 23	None
Upper Priest River	May 24	1 pair/ 3 drakes	N/A	Not surveyed

Black-backed woodpeckers, Coeur d'Alene River Ranger District: Drumming surveys for black-backed woodpeckers were accomplished again this year through a challenge cost share agreement with the Coeur d'Alene chapter of the National Audubon Society. Black-backed woodpeckers were heard in the Beauty Creek area, Buckles Mountain and Magee. This is similar to response areas the previous year. This year's surveys found no black-backed woodpeckers in the Jordan Saddle area. This lack of black-backed woodpeckers appears to correlate to logging that occurred in the area in the 1990s.

Reference: Evelyn L. Bull, Steven R. Peterson and Jack Ward Thomas. Resource Partitioning Among Woodpeckers in Northeastern Oregon. USDA Forest Service Research Note PNW-444. June 1986.

Whitebark Pine

Whitebark pine occupies the highest elevation and most severe high mountain sites in forested parts 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, and/or mountain hemlock. But at the highest elevations, it may be the only tree that can tolerate the severe conditions. Here, whitebark pine may effectively raise the tree line several hundred feet in elevation above where it might otherwise be. Whitebark pine has large, nutritious seeds that are an important food source for grizzly bear, black bear, Clark's nutcrackers, and red squirrels.

Whitebark pine is a shade-intolerant trees species that requires canopy openings for regeneration. Although whitebark pine trees are not highly resistant to fire, it responds by regenerating well after fire. And, because it is somewhat more fire resistant than spruce of subalpine fir, low severity surface fires likely give it some advantage over those species. Where whitebark pine grows in combination with spruce and fir, if there is no canopy-opening disturbance over a long time, whitebark pine will eventually be replaced by predominantly subalpine fir with minor amounts of spruce. In these mixed species stands, fire is essential to maintain whitebark pine.

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

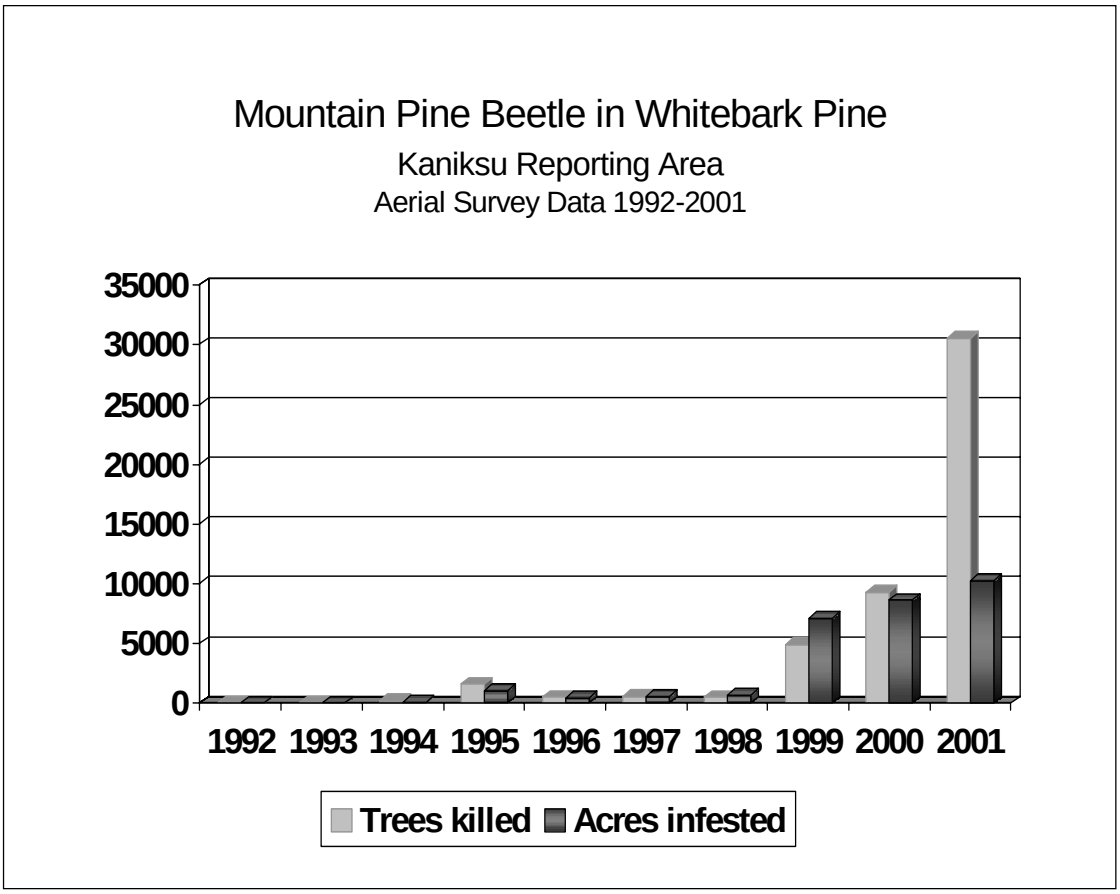
The largest and most continuous whitebark pine population remaining in Idaho, north of the Clearwater River, is on the high ridges in the northern Selkirk Mountains. Although this population had suffered a slow decline from blister rust, it was still clearly the best, most continuous, and largest whitebark 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. In 2001

both the area of the beetle outbreak, and the number of trees killed increased significantly from what was seen in previous years.

The following graph provides aerial survey data on how the 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 under-represent current mortality.

Figure 7. Mountain Pine Beetle in Whitebark Pine



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

Table 24. Mountain Pine Beetle Survey on Whitebark Pine

Location	Cutoff Peak	Fisher Peak	Trout Lake	Farnham Ridge	East Russell Ridge
# WBP examined	202	139	200	35	121
WBP alive	118 (58%)	99 (71%)	167 (84%)	8 (23%)	8(7%)
Current MPB attack	21 (10%)	17 (12%)	11 (6%)	3 (9%)	26 (21%)
Last year MPB attack	32 (16%)	14 (10%)	4 (2%)	2 (6%)	51 (42%)
Older MPB attack	24 (12%)	6 (4%)	13 (7%)	19 (26%)	30 (25%)
Unknown or secondary mortality	7 (3%)	3 (4%)	5 (3%)	3 (9%)	6 (5%)
Total Dead	84 (38%)	40 (29%)	33 (17%)	27 (77%)	107 (93%)
WBP killed by MPB in last 2 years	53 (26%)	31 (22%)	15 (8%)	5 (14%)	77 (64%)
WBP infected with BR	145 (72%)	90 (65%)	134 (67%)	20 (57%)	73 (60%)

Results obviously vary between different locations. Depending upon location, from 14% to as much as 64% of the whitebark pine in the survey areas have been killed by mountain pine beetle within the last two years. From 17% to as much as 93% of the whitebark pine are dead, depending upon area. Out of all the trees sampled, 26% have been killed by mountain pine beetle within the last two years, and 42% of all whitebark pine trees sampled are dead. These numbers do not count mortality represented by very old snags. Where there are still trees alive, whitebark pine mortality from mountain pine beetle is expected to continue over the next few years. And blister rust mortality is certainly continuing.

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 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) where the combination of blister rust and mountain pine has killed the overwhelming majority

of the whitebark pine, and appears to have removed it as a functioning component of the ecosystem in those areas.

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

We are also involved in a multi-regional effort to identify whitebark pine that may be resistant to white pine blister rust. In 2001 we located 15 whitebark pine trees that phenotypically appear to display some blister rust resistance. We collected cones from these trees, and seedlings grown from their seeds will become part of a regional program to test for genetic resistance to blister rust. We will identify and collect cones from another 15 trees for each of the next 4 years. Seedlings grown from all these cones will be screened for blister rust resistance. 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.

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 2001 the total number of fires per year ranged from 44 in 1993 to 586 in 1994. We averaged approximately 163 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 697 acres per year; this is about 2.3% of what would have been generated as a long-term running average by historic natural processes.

Wildfires are now largely suppressed by human beings (especially low and mixed severity fires). In 2001, the IPNF responded to 141 wildfires that were suppressed after burning 254 acres. About 85% of the fires were natural (lightning caused) and 15% were human caused. There were 3,040 acres of harvest related natural fuel reduction and 4,437 acres of hazardous fuel reduction.

For the 15 years since the Forest Plan was adopted (1987-2001), the IPNF has responded to 2190 wildfires, which burned 10,608 acres. Our last major stand replacing wildfire occurred in 1967. Without human suppression, over a historically typical 14-year period, wildfires might have burned 434,000 acres (although only 182,000 would have been stand replacing fires).

Wildfire vs. Human Disturbance

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

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

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

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

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

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

Table 25. 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
Total	**3,766**	**1,610**	**5,376**	**7,410**	**15,598**	**23,008**

APPENDICES

A. Forest Plan Monitoring Requirements

B. Forest Plan Amendments

C. List of Contributors

D. Water Quality Monitoring Results

E. Visual Quality Monitoring Summaries – Closed Sales

Appendix A. Forest Plan Monitoring Requirements

Table 26. 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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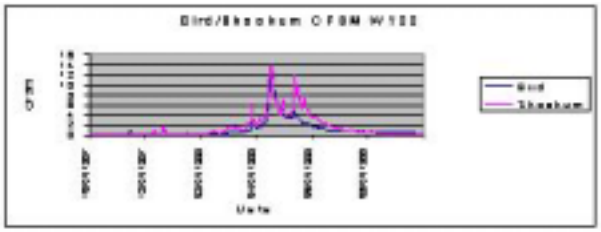
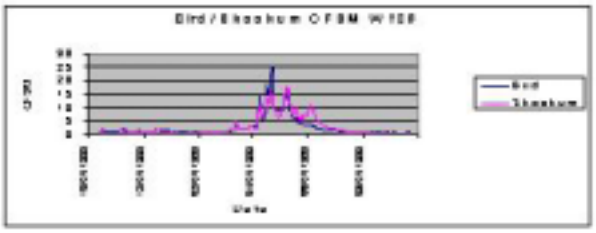
Appendix D
Water Quality Monitoring Results

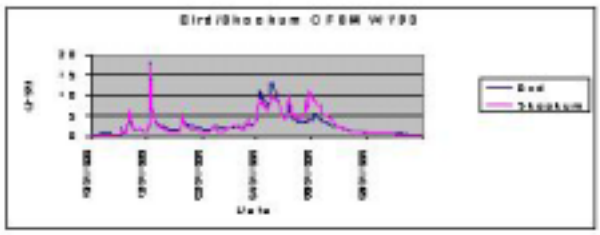
The following charts compare the normalized mean daily discharges measured in Bird Creek (red) and Skookum Creek (blue). Discharges are normalized to drainage area and are reported as cubic-feet-per-second-per-square mile of watershed (cfsm).

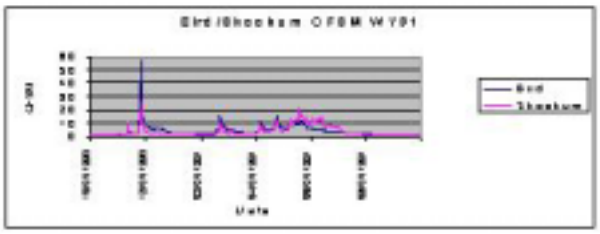
Some observations of this data are:

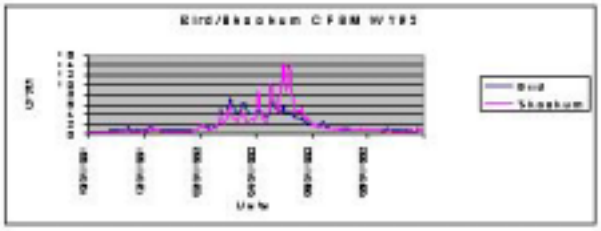
- Skookum Creek (a smaller watershed, but with higher elevations) tends to peak higher and more frequently;
- Skookum Creek tends to peak later in the year and often exhibits two or three peaks near the end of the snowmelt season,
- Bird Creek gives indications that it begins its snowmelt hydrograph earlier;
- In spite of the extensive development and “hydrologic openings” that exist in Bird Creek, there is no observable evidence that peak flows have increased substantially or that rain-on-snow responses have been exagerated.

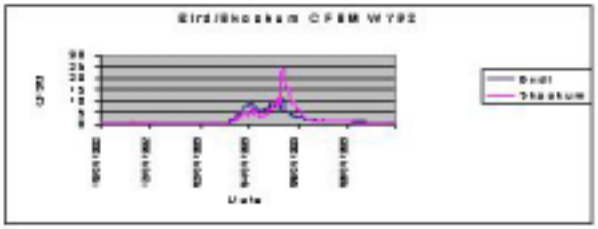


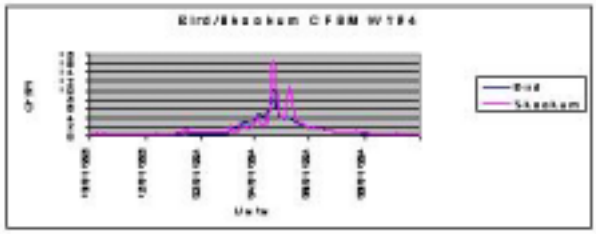


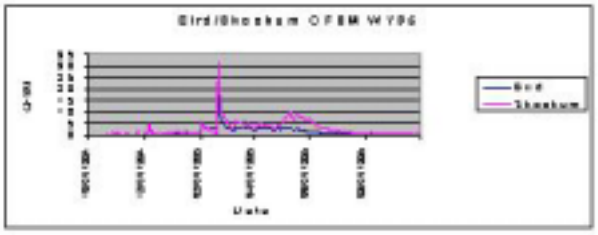


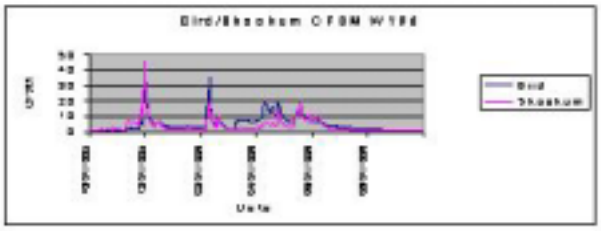


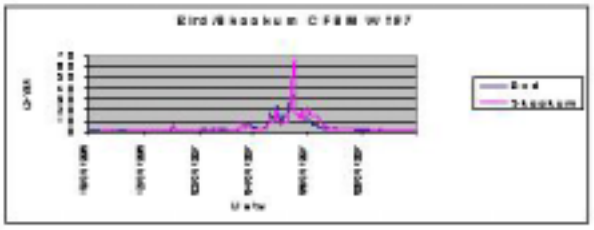


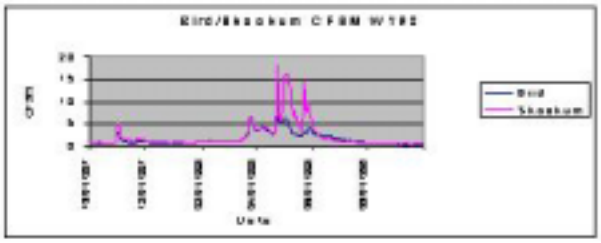


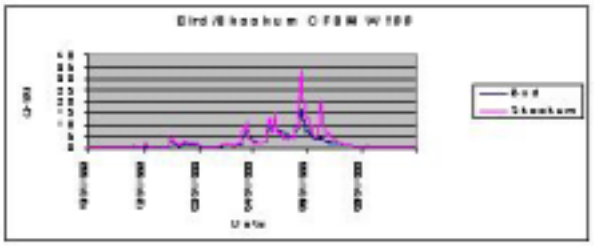


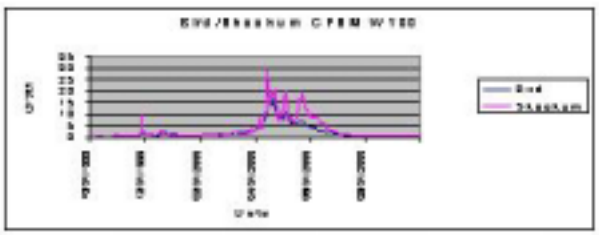












2001 Central Zone Watershed Monitoring Report

Idaho Panhandle National Forest
Coeur d'Alene River Ranger District
November 15, 2001
Hunter Techau

Type of Monitoring: Implementation

District: Central Zone

Project Name: Brett Creek Rehab

Site Locations: 804A, 804B, 995, 995A, 995UA, 995UB, 995UC, 995UD, 995UE, 6301, 6301A, 6301C

The Brett Creek Rehab public works contract implemented restoration work on a total of 12.48 miles on 12 different roads. A total of 40 stream channel crossings were restored on these 12 roads. Full obliteration was not required for watershed improvement on all of these roads. Of the 12.48 miles worked, 2.61 miles of road were recontoured. These recontoured areas were on sections of riparian road that was encroaching on the stream channel. Besides the full obliteration of these riparian roads, 7 of the 12 roads were closed with front-end obliterations. All channel sites on the 12 roads were restored to natural conditions. Of the 40 channel crossings restored, 27 were deep fills from 25 to 50 feet deep and 13 were from 0 to 25 feet deep.

Automated sediment samplers were set up in Brett Creek on the upstream and downstream sides of a channel site that was restored. This was done to measure turbidity in the stream before, during, and after rehab in order to determine the short-term effects of restoration on water turbidity. Turbidity measured at the upstream sampling location never rose above 0.9 NTU's. Results from the downstream sampler mimicked those of the upstream sampler until the day that the channel site was restored. Turbidity rose to 3.4 NTU's on the day of the rehab and two days later had dropped back to 1.2 NTU's. Turbidity peaked at 4.2 NTU's one week after the rehab was completed, but dropped to 0.9 two days after the peak. This peak in turbidity is likely due to heavy precipitation causing some unconsolidated fine material to be transported downstream from the restored channel site. Despite the rise in turbidity after restoration activities, turbidity levels were still well within the maximum level of 25 NTU's set by the State of Idaho.

Type of Monitoring: Implementation

District: Central Zone

Project Name: Crinkle Kut Rehab

Site Locations: 2, 4, 236, 3093A, 905A, 1, 3, 905B, 918, 918A, 918C, 918D

The Crinkle Kut Rehab public works contract implemented restoration work on a total of 8.14 miles on 12 different roads. A total of 12 stream channel crossings were restored on these 12 roads. Full obliteration was not required for watershed improvement on all of these roads. Of the 8.14 miles worked, 6.19 miles were recontoured. These were mostly riparian roads that encroached on the stream channel. Road 236 was a total of 2.05 miles long. Of this 2.05 miles, 1.85 miles were recontoured while the other .20 miles had 5 waterbars installed on it. In addition to these 5 waterbars, 23 other waterbars were installed on two other roads. Roads that had only the stream crossings restored were closed with a 200 foot front end obliteration. Of the 12 channel crossings restored 11 were 0 to 25 feet deep, and 1 was 25 to 40 feet deep.

Type of Monitoring: Implementation

District: Central Zone

Project Name: Kings Ridge Rehab

Site Locations: 2344A, 2344B, 2344C, Lake Gulch Road, Last Creek Road

The Kings Ridge Rehab public works contract was started at the end of the 2000 field season. The contractor worked 3 or 4 days before getting snowed out. Part of the Lake Gulch road work was completed. Specifically the 6541D road was recontoured between the Lake Gulch and Lost Creek.

Work was completed on this contract in the 2001 field season. Restoration work was implemented on a total of 7.59 miles on 5 different roads. Of this 7.59 miles, .74 miles were fully recontoured. A total of 13 stream channel crossings were restored to natural conditions. Of the 13 channel crossings that were restored 12 were from 0 to 25 feet deep, and 1 was 25 to 40 feet deep. In addition to this channel restoration, a drivable ford was constructed on the Lake Gulch road to decrease sediment risk while maintaining access to mining claims.

In addition to the channel sites restored on the 2344B and 2344C roads a total of 48 waterbars were constructed, 28 on the 2344B and 20 on the 2344C. These roads were both closed by front-end obliteration. The 2344A road had 12 drivable waterbars constructed on it, but was not closed with a front-end obliteration.

Type of Monitoring: Implementation

District: Central Zone

Project Name: Tepee Wetlands

Site Locations: Tepee Creek Project Area

The Tepee Wetlands Project involved construction of approximately 3 acres of wetland in the Tepee Creek riparian area. The wetlands were incorporated into the area around Pond 3, which was constructed during the Tepee Creek Restoration project (2000). The Tepee Tweak Project was tied into the Tepee Wetlands Project also so that fill material from the wetlands excavation could be used to repair and reinforce potential problem areas of the Tepee Creek Restoration Project.

Initial planning involved survey and design of the wetlands area to ensure the construction of three acres of wetland and to estimate the volume of fill that would need to be removed during construction of the wetland. Deposit areas for this fill were identified as part of the Tepee Tweak Project. Fill would be hauled to 6 different locations, the largest being the closest to the wetland site. It was decided that any excess fill material would be hauled to this site, as it had the room to deposit the material.

Four log truck loads of wood were hauled to use in the wetland for habitat diversity. Some of this wood was also used during the implementation of the Tepee Tweak Project. New sections of revetment were built at two meanders, and an existing section of revetment was reinforced at another meander. Four additional log barbs were also constructed using this wood.

As fill material from the wetlands was hauled to the various dump sites, a dozer was used to spread the material over the desired area of the flood plain and to the desired height. Fill was added to sites in order to help prevent Tepee Creek from recapturing sections of the old channel that still exist on the landscape. During a flood event this additional fill is designed to direct water onto the flood plain where sheet flooding can occur, rather than having flood waters head cut into existing sections of the old channel.

As excavation was completed, topsoil salvaged from the surface before excavation was spread over the wetland bottom to bring the bottom up to final elevation and to provide good soil for planting of wetland plants and native vegetation. Four islands were constructed during the excavation phase of the project by leaving areas undisturbed as the wetland was excavated around them. Depressions were dug around the perimeter of each island in order to maintain water around the islands during much of the year.

After completion of excavation and placement of topsoil, wood was placed throughout the wetland to provide habitat diversity for animals using the area. Wood was placed on the wetland bottom and on and around the islands. Two logs were stood up in the wetland to act as snags and a rootwad was turned upside down to provide a place for birds to rest.

A native seed mix was used to seed all disturbed areas, such as haul routes and dump sites, after machinery was moved out. The wetland itself will be planted with willow, sedges and other wetland species of plants during the field season of 2002.

Throughout the field season several large cutthroat trout were observed using habitat created during the Tepee Creek project. Fish were using the deep pools constructed at meander bends during the Tepee Creek Restoration project of 2000.

Type of Monitoring: Effectiveness

District: Central Zone

Project Name: Tepee Creek Restoration

Site Locations: Entire Tepee Creek Restoration Area

The Tepee Creek Restoration area was walked several times during the spring runoff period of 2001. It was observed that the constructed channel was functioning very well and holding together except for meander bends 15 and 16. Erosion was occurring at these two places due to the radius of curvature in the design being too tight. The stream was trying to straighten itself out in this area by eroding the outside of meander 15. It is estimated that approximately 20 yds^3 of bank material were lost due to erosion at this site. As this erosion occurred, the water was being directed between two log barbs just above meander 16. These two barbs were designed to direct the flow of water around meander 16 as the water flowed perpendicular to them. As the erosion at pool 15 occurred the flow at these barbs became more and more parallel to them. Consequently, the barbs did not function as designed and eddying occurred on the upstream side of them. This eddying created scour that eroded the bank on the upstream side of the barbs. It is estimated that approximately 30 yds^3 of material were lost due to erosion at this site. Although the erosion occurred the barbs maintained their positions throughout the spring runoff. Repairs were made at these two meanders with the Tepee Tweak Project.

The spring runoff of 2001 was not at the bankful level, but was high enough to give the Tepee Creek Project a good test. Observations made during field trips when the water was high revealed areas of point bars and meander bends that appeared to be too high or too low. Decisions were made to adjust the height of some of these areas to ensure that the water during a bankful event would escape the channel on the point bar side of the meanders before escaping on the outside of the meanders. These changes were implemented with the Tepee Tweak Project.

Overall the channel constructed during the Tepee Creek Restoration Project functioned very well, incurring only minor damage in two areas. Streamside vegetation was not yet established during the spring runoff of 2001, and thus provided less than adequate protection against erosion. The less than bankful runoff of spring 2001 gave this vegetation time to establish itself before being put to a heavier test. Vegetation came in well during the growing season of 2001 and will help provide protection against heavier future runoff. Additionally, trees and shrubs were planted along the stream banks during the spring of 2001 providing extra protection against stream bank erosion.

Type of Monitoring: Implementation

District: Central Zone

Project Name: Tepee Tweak

Site Locations: Pool 2, Pool 4, Pool 5, Pool 6, Pool 8, Pool 9, Pool 11, Pool 15, Pool 16, Pool 17

The Tepee Creek Restoration project area was walked several times during the spring runoff period of 2001. The spring runoff of 2001 was not at bankful level, but was high enough to give the Tepee Creek project a good test. Overall the channel constructed during the Tepee Creek Restoration Project functioned very well, incurring only minor damage in two areas. Observations made during field trips when the water was high revealed areas of point bars and meander bends that appeared to be too high or too low. Repairs to the areas where damage occurred, and modifications to these high and low areas were addressed with the Tepee Tweak Project.

At Pool 2 approximately 2000 yds^3 of material from the wetland project was used to raise the height of the bank on the outside of the meander leading into the revetment. This material was carried at this elevation across the flood plain within the area that was disturbed by the Tepee Creek Project and then blended to natural ground. Some of this material was also used to fill a portion of the old channel.

At Pool 4 the meander bend is truncated due to attempts to preserve vegetation on the flood plain. During the Tepee Tweak four additional log barbs were installed to provide bank protection upstream of the pool, and to help direct the water around the truncated meander.

At Pool 5 it was evident after the water dropped that it had been up over the top of the revetment at the head end of the pool. No serious erosion occurred, but the potential was there for problems to develop during periods of higher runoff. To remedy this problem another layer of revetment was added to the existing revetment to make the overall height taller, thus eliminating the potential for bankful runoff to flow over the top layer of revetment.

At Pool 6 the concern was that the outside of the meander bend was too low. Approximately 250 yds^3 of material were used to raise the area just upstream of the revetment by approximately one foot.

At Pool 8 the concern was that the point bar and flood plain were too high. The flood plain on the point bar side was lowered approximately one foot, starting 30 yards below the end of the revetment at pool 7, and continuing around the bend to the end of the revetment at pool 8. Material gathered during this process was spread into a depression on the floodplain adjacent to where the work was done.

J-hook veins both above and below Pool 9 were creating some undesirable scour. It was determined that structures were still needed along the outside of the meander bend in order to help direct the water around the bend and relieve pressure on the banks. Rather than remove the entire J-hook vein at each location and then build new structures,

the curved part of each J-hook was removed and the rocks were used to extend the leg of the J-hook out to form a straight barb. In addition to straightening the J-hook veins more than 4000 yds^3 of material from the wetland were added to the outside of the meander to raise the floodplain. This was an area of concern because of the potential for Tepee Creek to recapture the old channel by headcutting through the floodplain during a flood event. Raising the flood plain provides some security against this happening. Some of the fill material dumped in this area was also used to raise the bottom of the old channel. This section of the old channel was acting like a pond. By raising the bottom the water depth was made more desirable for wetland species of plants, and ultimately contributed to the final amount of constructed wetlands.

More than 2000 yds^3 of material from the wetland were added to the floodplain at Pool 11. The height of the bank was not increased in this area, just the height of the floodplain starting approximately 10 yards from the edge of the stream. The floodplain height was increased to keep Tepee Creek from capturing the old channel during a flood event. The floodplain height was increased in a manner that would keep high water from entering the old channel, but allow the water to sheet flood onto the entire floodplain just downstream of where it could potentially capture the old channel. This design allows Tepee Creek to utilize the maximum amount of floodplain, while protecting the old channel from capture via headcutting, in an area where flood waters will have a lot of energy.

Pools 15 and 16 showed the most damage after spring runoff in 2001, and thus were the top priority during the Tepee Tweak Project. Erosion was occurring at these two places due to the radius of curvature in the design being too tight. The stream was trying to straighten itself out in this area by eroding the outside of meander 15. Consequently the water was being directed between two barbs just above meander 16. These two barbs were designed to direct the flow of water around meander 16 as the water flowed perpendicular to them. As the erosion at pool 15 occurred the flow at these barbs became more and more parallel to them. Consequently, the barbs did not function as designed and eddying occurred on the upstream side of them. This eddying created scour resulting in approximately 30 yds^3 of material being eroded from the bank. Repair work at these two sites involved construction of additional sections of rootwad revetment at the downstream end of pool 15 and the upstream end of pool 16. Revetment was constructed where erosion was occurring the most. At Pool 15 the revetment was set back widening the radius of curvature, and the bank downstream of the revetment was shaved off to complete the widening. This widening was done along the lines that Mother Nature had already begun to establish. The bank that was shaved was blended into the point bar at Pool 16 and the point bar was lowered and reformed to accommodate the new radius of curvature. At Pool 16 the bank that was eroding where the log barbs were installed was repaired with two sections of rootwad revetment. The logs barbs were removed and reinstalled upstream of the revetment. The log barbs were reinstalled at the proper angle to match the new radius of curvature established at Pool 15. Approximately 100 yds^3 of wetland material was added to the floodplain at Pool 15 to raise the bank over the top of the new revetment.

At Pool 17, approximately 200 yds^3 of wetland material was added to the floodplain on the upstream side of the revetment. This was done so that water during a flood event would escape the channel on the point bar side of the meander before

overflowing on the outside of the meander. The floodplain was raised approximately 1 foot and the material was blended to the height of the existing flood plain over the top of the revetment.
Type of Monitoring: Implementation

District: Central Zone

Project Name: Tepee Creek Planting

Site Locations: Tepee Creek Restoration Stream Banks

The Tepee Creek Restoration area was planted with tree and brush species during the spring of 2001. This was done to develop bank stabilization in the project reach. Approximately 25,000 stems were planted along the stream. Stems were planted the length of the project area from the waters edge to a maximum width of 10 feet from the top of the bank. Two by two spacing was utilized along the riffles while one by one spacing was utilized on the point bars and outside meander bends. Species planted included lodgepole pine, engelmann spruce, western red cedar, red-osier dogwood, black cottonwood, willow, snowberry, and alder. Plant survival was good despite a very hot, dry summer. Hand watering was implemented using hose lays and a Mark 3 pump for two weeks during the summer to give the plants enough moisture to survive until fall rains came. Mortality due to browsing by deer and elk was almost non-existent.

Cochran's Draw Monitoring Report

Investigators: Jason Shira and Shawn Jacobs
Date: 7/01, 9/4/01 – 9/5/01

Objectives:

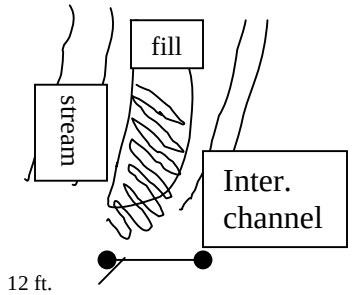
The objectives of this monitoring program are to evaluate the condition of decommissioned roads over-time. The Cochran's Draw site was decommissioned in 1996. The items of interest are risk for future mass failures, the condition of past mass failures, the comparison of bucket versus cat ripped road surfaces, and the invasion of noxious weeds.

1082 road from Trestle Creek:

1st crossing fill was not pulled back far enough on left bank. It is a high probability that high flow will cut into fill. Fill is approx. 3 feet high with near 70°+ slope. Wetted width of stream is 9 feet.

2nd crossing -- Gabion in seep next to crossing is functioning well. No signs of failure or rerouting.

• Stream crossing has 10 feet of fill next to stream. A large water bar diverts surface flow from cutting the fill into the stream.



3rd crossing – Gabion in seep is well established, stabilizing the slope, and permitting flow.

4th crossing – 5 feet of fill on left bank of stream with 70°+ slope may fail with high flow event. Jute fiber mat on right bank has stabilized bank allowing fireweed, grasses, and daisies to establish.

• Gabion structure is well established in seep, stabilizing the slope, and permitting flow through the French drain.

• Mass failure ~75 yards from stream crossing. The slide is 59 – 8 ft. wide (tapering toward terminus) X ~150 ft. long, reaching creek, with a slope of 40^{o}. Trigger for the mass failure appears to be seeping from under road (6ft. x 2ft. seep noted) and over-land/inter flow from inboard ditch.

1326 road above 1082:

Pic. 1 – 1326 road

Pic. 1 is a crossing on a very steep slope. The approx. fill depth was 70 ft. The oblit is stabilized and is established with Yarrow, alder, fireweed, and grasses.

1082 A, B, C, and D Junction:

Pic. 2 -- 1082 oblit. NW exposure before 1082D junction.

Pic. 3 – Bucket rip on 1082B road.

Pic. 4 – 1082B bucket rip

Pic. 3 and Pic. 4 show bucket rips on 1082B road. Pic. 3 illustrates the flora that dominate the site (Yarrow, alder, fireweed, grasses, and huckleberry). Pic. 4 illustrates the ripping pattern of a bucket rip. The bucket rip leaves a water bar appearance and tills the substrate.

Pic. 5 – 1082D road oblit SW exposure

Pic. 6 – 1082D Cochran's Draw X-ing cut bank failure

Pic. 6 shows a small slide next to Cochran's Draw. The slide occurred on the cut bank side of the road it is 25ft. x 50ft. and stops on the oblit. The water temp. at Cochran's Draw was 7^{o}C.

Pic. 7 illustrates the cat rip for tilling the road. The cat rip left large furrows in the old road. Which tend to route water. It was also evident that the cat ripped roads had a greater deal of fill cracking. The cracking could also be contributed to other factors (slope, fill depth, substrate), though the

road did not have any signs indicating other factors were responsible.

Conclusions:

The monitoring project for Cochran's Draw has three major items of concern. One is the regeneration of flora, two a comparison of bucket versus cat ripped road surfaces, and three the risk of future failures, along with the condition of past failures.

The regeneration of flora over the whole decommissioned road is sparse. There is good growth of alder, fireweed, raspberry, and yarrow, but the is a very small percentage (>5%) of tree species regenerating. There is a large amount of tansy growing on the lower portions of the 1082 road, but the upper road system is dominated by native species with little invasion by noxious weeds.

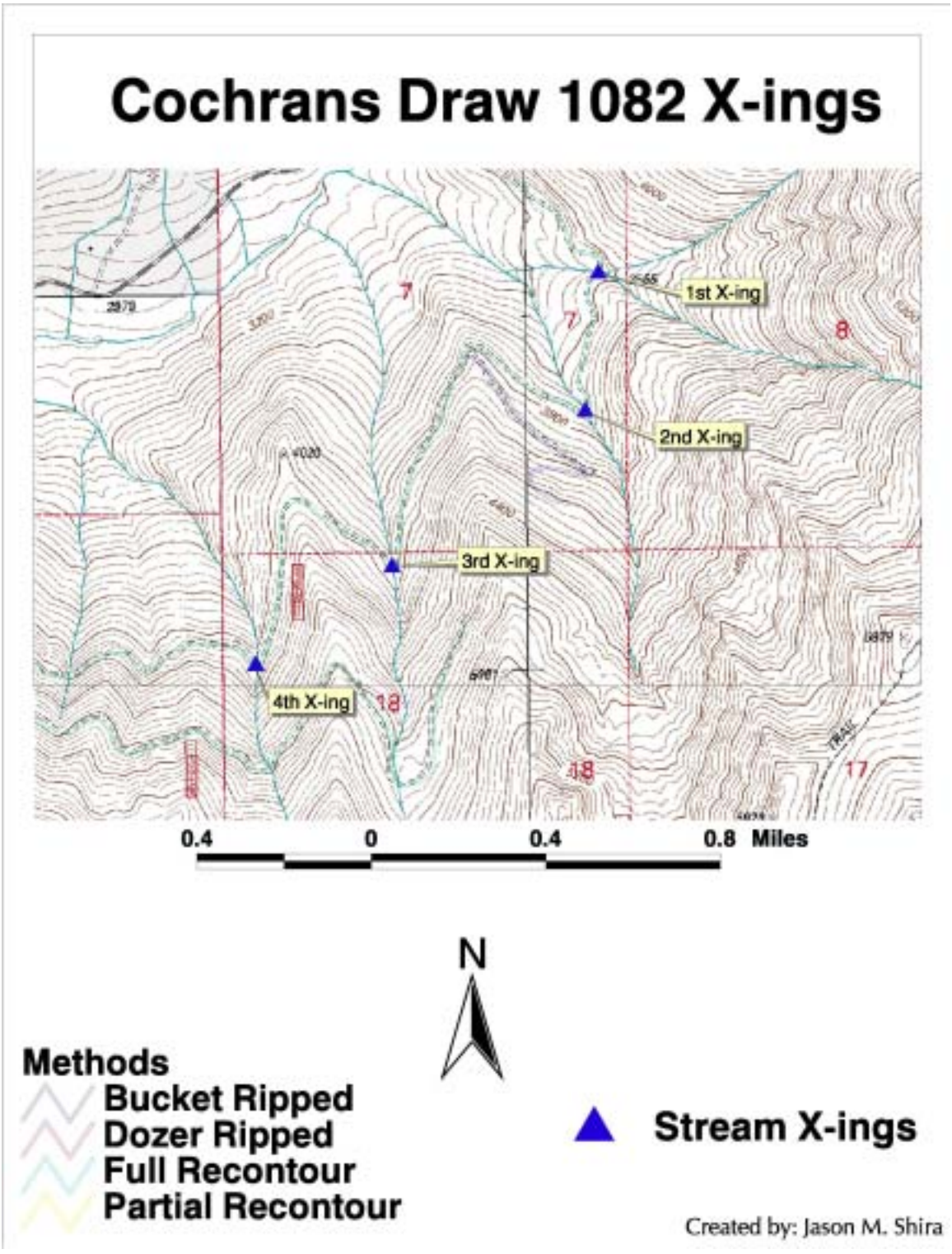
The comparison of bucket versus cat ripping techniques indicates that bucket ripping is the better choice. The cat ripped roads are deeply furrowed and tend to route water (evident by scour marks); whereas, the bucket rip tilled the substrate more and left a zigzag of water bar like features. Both techniques accelerate the ability of the slope to reclaim itself, but the cat ripped portions monitored had evidence of cracking, where the bucket ripped were smoothly recontouring the fill slope with no evidence of sloughing or failure.

One mass failure was investigated. It is located at the 4th crossing on the 1082 road from the Trestle Creek bridge. The dimensions of the failure are on page one. It is probable that the failure is contributing sediment to the creek and is still active during time of high runoff. The triggers for the failure appear to be from overland flow and interflow that has been rerouted due to compaction layers from previous road.

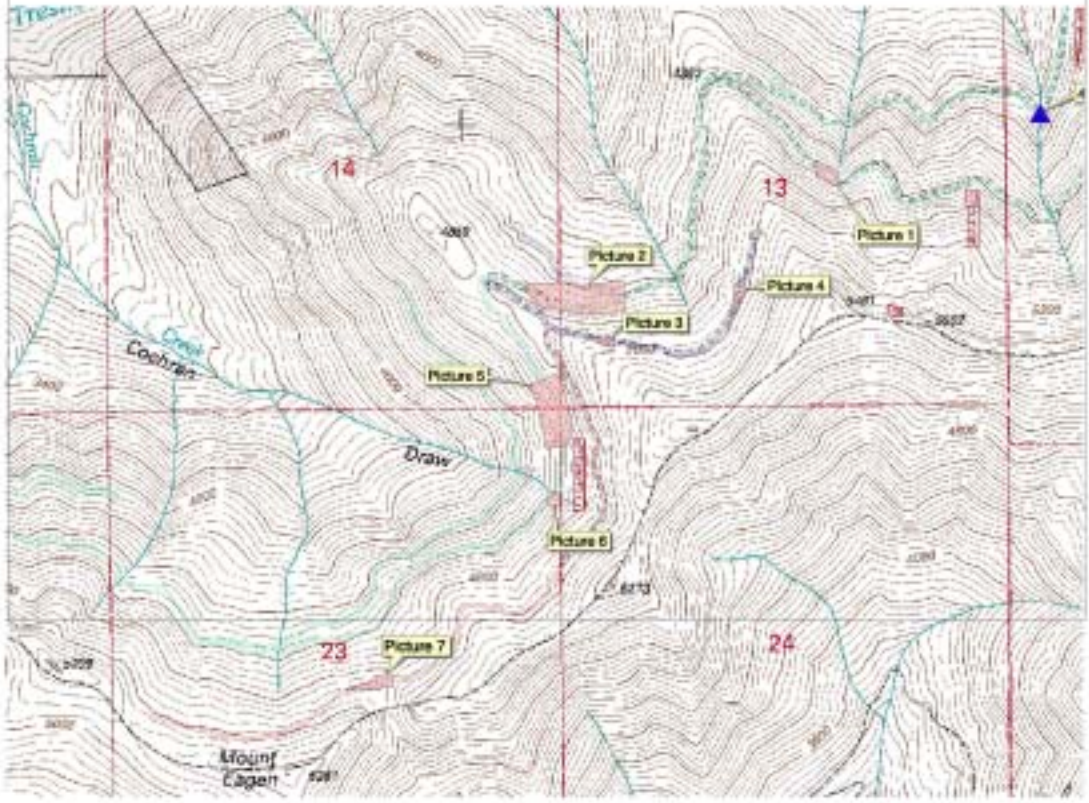
There was no indication of risk for future failures. Though due to the vast amount of road decommissioned it was hard to reach all points of interest to investigate thoroughly.

Note on future monitoring:

The semi-remote and treacherous nature of the terrain may make it more feasible to use a helicopter for monitoring. The use of a helicopter would reduce the days it would take a crew of two to investigate down to a day at most. Other wise in order to thoroughly investigate the area it would require a 3-4 day backpack mission.


Cochrans Draw 1082 X-ings
1st X-ing
2nd X-ing
3rd X-ing
4th X-ing
7
8
18
17
0.4
0
0.4
0.8 Miles
N
Methods
Bucket Ripped
Dozer Ripped
Full Recontour
Partial Recontour
Stream X-ings
Created by: Jason M. Shira

Cochrans Draw Picture Sites



0.5 0 0.5 1 Miles

N

Methods

- Bucket Ripped
- Dozer Ripped
- Full Recontour
- Partial Recontour

Picture Sites

Created by: Jason M. Shira

Grouse Creek Photo Monitoring Project

This monitoring project was initiated on Grouse Creek in 1997 prior to a large stream enhancement project. Seven photo points were established along a one mile section of lower Grouse Creek. Several photos were taken at each site to capture upstream, cross-channel, and downstream views. Setting up each site entailed finding a good observation point, taking compass bearings so that each photo can be accurately reproduced, recording photos, and installing a permanent monument. This summer a new set of photo points was added to the monitoring project bringing the total of photo points along Grouse Creek to eleven. These four new sites are intended to document existing conditions in the Grouse Creek channel in section 20, below the past project sites. For summer 2002 we are proposing a stream enhancement project and these new photos will be useful in documenting changes in the channel. The existing photos have proven a useful reference tool for determining the extent of channel changes and for relating the effectiveness of our enhancement projects.

Grouse Creek Photo Point #2

Bonners Ferry Ranger District - Monitoring Report - 2001

Type of monitoring: K.V. monitoring for effectiveness.

Project Name: Trout Fisher

Site Locations: The new road construction and new reconstructed roads in the Ham/Fisher portion of the sale area. That includes roads 2428, 2428B, 2426C, 2426 and 2551.

Objectives: Assess the effectiveness of the stabilization of the new road prism and the new reconstruction that was accomplished through seeding the cut slopes and road surface and constructing water bars. Recommend future corrective projects to enhance road stability.

Methodology: Ocular field review was accomplished by hydro-tech and district engineering tech on 10-3-01.

Summary

Road 2428 was driven in it's entirety, the seeding of the road surface is 90% successful although the wheel tracks may only be approximately 10-15%. The road is water barred on an average of 70-100ft apart, these water bars are steep to drive through, but are drivable. They are 95% successful at removing runoff before it can erode the surface and cause erosion problems to the road surface and the fill slopes. A photo was taken near end of the road looking back down road to the west, trying to show vegetation on road surface. A photo was taken showing view of water bar and drainage crossing where road isn't as well seeded. The re-construction of this road used plastic drainage pipes and it appears to have adequate cross drainage.

Road 2428B was not driven to the end because of a crossing that has been re-constructed that may not have been passable to our vehicle. This site has cracked and slumping fill for approximately 50 ft. on the left bank and 20 ft on the right bank, I took a photo to try and show the cracking and slumping. The crossing is draining a very wet ditch line due to slope interception there is not a defined channel up-slope at this site. The information from the engineering tech (Ned Davis) revealed the road was constructed with geo-textile to attempt to stabilize the road prism, because of the unexpected saturation once the slopes were disturbed. Road slash was incorporated into the toe of the fill and contributes to the instability at this site. The slopes below the road are not that steep I would estimate approximately 30-40%, but there is an unnamed tributary flowing to Trout creek that is approximately 200 ft down slope. **This site is identified on the map in the K.V. folder**. We hiked in from this site to the end of the road, the area has very wet slopes but the road appears to be stable and well drained. The road grade is gentle and so are the slopes below the road. The road is cross-drained with plastic pipes and has some turnpike construction. I took a photo to show the vegetation through the turnpike section.

Road 2426C was driven until the brush became un-drivable. The vegetation on this road is 95% successful, it is also water bared and the erosion control has been effective on the

road surface. We did not have time to walk to the end of the road and monitor beyond where we could drive this should be done on our next trip in.

Road 2426 is the main road up into Farnham creek, the end of that road was decommissioned in 1997. **In 1999** we continued the de-commission where we had left off **in 1997** and did full oblit and non-drivable water bars up to the junction with road 2551. I walked in and monitored up to the full oblit segment. The work is successful the obliteration is stable and beginning to grow in with some vegetation. The soil composition does not lend itself to rapid vegetation growth due to its' extremely high rock content. This area had been heavily hand seeded, but the growth is spotty and it appears as though the native vegetation has been more successful. Photos were taken of the oblit and a water bar to demonstrate the successful condition and vegetation growth. From the junction with 2551**, road 2426 was given extra protection** by the construction of drivable water bars, 9 armored dips, 2 rock buttress's, ditch line improvements and up graded pipe installations, one of which was on an unnamed tributary to Trout creek. The **successfulness** of this work **would be a good example for future projects that require similar prescriptions.** Photos were taken of the 42" culvert on trib. to show stability at that site (previously it had blown out 2 times). Photos were taken of the rock buttress and the armored dips. **There are comparative photos that were taken at the time of construction.**

Road 2551 had the last 1.34 miles de-commissioned in 1997, we walked into this up to a draw that had been re-constructed, but was not constructed to grade at the outlet. There is not evidence of any severe down cutting. I don't think this draw carries enough water to create a concern. There are remnants of pipe still buried in the channel that prove that the channel was not excavated to grade. The vegetation on this road is coming in, but is spotty and does not cover the whole road prism, again it appears as though the native plants are more successful than the seed mixture placed at the time of the de-commission. This road should be revisited and walked to the end to complete the monitoring over the Fisher creek crossings.

Road 2551 does have a serious cracked fill problem that is just up from the junction with road 2426 a few 10ths' of a mile. Ned and I placed sticks and flagging for warning to other drivers, we took photos and Ned took a clino shot and said the slopes were 70% and the road fill was 110%. The potential for road failure and consequently a landslide are extremely high! Ned made arrangements with Roth and Steinhorst to take an excavator in and attempt to make at least a temporary fix for this year. We hope that it holds together for one more winter and spring runoff and allows us time to repair. If it does fail it will slide over the de-commission on road 2426.

Corrective measures: Future monitoring of these roads will be necessary due to the lack of road maintenance behind the gates and barricades. These roads still have the potential for failures where the drainage structures have not been removed and re-contoured. If the dollars become available I would recommend we go in and construct armored drivable dips that tie into the ditch line placed down road of the pipes with the higher risk factors.

BEST MANAGEMENT PRACTICES

MONITORING REPORT FOR 2001

submitted by
Jill Janecek Cobb, District Hydrologist
Priest Lake Ranger District

February 14, 2002

Each year the Priest Lake Ranger District reviews which Best Management Practices (BMPs) were most effective at protecting aquatic resources. The BMP reviews examine timber sales as well as past watershed restoration efforts and any other activity of USFS managed land that could affect aquatic resources. The following is a compilation of those BMP reviews completed in fiscal year 2001.

This year's reports include a variety of topics ranging from road obliteration to road maintenance. The following is a brief summary of the reports.

1) Road construction Best Management Practices (BMPs) application and effectiveness for the Road 312 Reroute and Road 416 Reroute including obliteration of an encroaching road segment and new construction.

2) Longterm monitoring of a road obliteration project from 1991 in the South Fork Gold Creek drainage.

3) Road maintenance and site stabilization following the implementation of the Kalispell Granite Bear Management Access Plan. Specific report addresses Roads 1013 and 311.

4) Evaluation of ongoing Road maintenance on those roads closed for Grizzly Bear Security

5) Evaluation of longterm effects and natural stabilization of the Fedar Creek Slide

6) Review of KV stabilization efforts

TYPE OF MONITORING: Effectiveness, Implementation

DISTRICT: Priest Lake Ranger District

PROJECT NAME: Road 312 Closure and Relocation Monitoring

OBJECTIVES:

1) Attempt to restore the hydrology to a floodplain through road decommissioning.
2) Determine if BMPs applied during road closure projects effectively protected resources.
3) Identify solutions where problems exist with BMP implementation

Squaw Valley Road 312 Road Obliteration and Reroute

This road was obliterated in fiscal year 2000 under the direction of the Douglas-fir Beetle EIS. The original purpose of this project was to obliterate the main 312 road that was encroaching on the floodplain of the Upper West Branch of the Priest River. Originally, this road was going to be completely removed from the floodplain. However, the zone hydrologist modified the original prescription. Instead of removing the entire road and increasing the risk of additional sediment, the zone hydrologist modified the original plan. Under the revised prescription, the top six to eight inches of the road was removed, five pipes were removed and additional drainages were cut through the old road to connect the existing wetland to the mainstem of the Upper West Branch. Approximately half of the exposed surface was hydroseeded at the time of disturbance. The other half of the road was handseeded in November when there was 3 inches of snow on the ground. Slash was scattered along the entire road to prevent motorized access and to create microsites.

A year later when the road was resurveyed, the following information was found:

1) The seed that was spread on the snow did not take hold like the seed that was spread in August when the soil was originally exposed.
2) The sites where the culverts were removed looked well overall, there was no additional down cutting.
3) The “created” stream channel connecting the wetland to the main channel looked very stable. It was beginning to revegetate and there was no major down cutting.
4) The 50 cedars that were planted in the spring of 2001 had marginal success. This is likely due to the fact that the residual road fill was not ripped and therefore the compacted material was not conducive to the trees survival.
5) The hydroseeding and use of slash filter windrows on the newly constructed cut and fill slopes of Road 312 very effectively reduced erosion.

Photo showing obliterated portion or Road 312. This portion was hand -seeded over snow.

Photo showing reroute and obliteration of Road 312. Oblit. Is linear feature on left. The new construction is the bright white road extending from the bottom left to the center.

TYPE OF MONITORING: Effectiveness, Implementation

DISTRICT: Priest Lake Ranger District

PROJECT NAME: Road 416 Closure and Relocation Monitoring

OBJECTIVES:

1) Attempt to restore the hydrology to slopes through road decommissioning.
2) Determine if BMPs applied during road closure and road construction projects effectively protected resources.
3) Identify solutions where problems exist with BMP implementation

The USFS and the US Corp of Engineers worked cooperatively to obliterate an encroaching road segment and construct an alternate route. The work was completed in fiscal year 2000 and reviewed in fiscal year 2001.

Under the authority of the Douglas Fir Beetle EIS, the obliteration and relocation of USFS Road 416 was identified as a watershed improvement opportunity. At the time the work was originally planned to occur, the USFS staff was unable to complete the task because of limited personnel and thus the agency contracted with the US Corp of Engineers to complete the work.

This was the first attempt by the North Zone of the IPNF to contract with the US Army Corp to complete watershed enhancement projects. After several months of communication and coordination the work was completed.

The project included deep ripping and partial recontouring the original roadbed and new construction and stabilization of an alternate route. The contractor also was required to use slash, grass seed, fertilizer, straw mulch and unmerchantable slash to stabilize the site and encourage revegetation. In May of 2001, approximately 50 cedar trees were planted along the riparian zone of Quartz Creek.

When the site was resurveyed in July of 2001, the grass growth was thick and ranged from 1.5 to 3 feet high. The cedars were also still alive. The site did not show any active erosion. This was attributed to the successful use of grass seed, mulch and slash along the disturbed sites in the riparian zone and along the new construction.

Recontoured portion of “old Road 416” adjacent to Quartz Creek. Note the use of slash and the successful revegetation of the slope.

New construction of relocated Road 416. Note the stable lushly vegetated cut and fill slopes and the use of slash filter windrows.

TYPE OF MONITORING: Effectiveness, Implementation

DISTRICT: Priest Lake Ranger District

PROJECT NAME: Closure Monitoring for Roads: 1382D, 311 and 1104

OBJECTIVES:

1) Attempt to restore the hydrology to slopes through road decommissioning.
2) Determine if BMPs applied during road closure projects effectively protected resources over the **longterm.**

Road 1382: South Fork Gold

This was the first road that was ever obliterated on the Priest Lake Ranger District. This road was obliterated in 1991 under the South Fork Gold KV Plan. The site has been reviewed fairly regularly since it was initially completed. When the road was obliterated it was a mix of full and partial recontouring, the channels were stabilized with a mix of mulch mats and no mats at all, all of the road was seeded, fertilized and mulched with straw. The site was planted about 3 years after the obliteration was completed. The predominant geology is glacial tills.

In 2001, the District hydrologist reviewed the site and found that the stabilization was very effective in several ways. The recontoured slopes were well grassed, the planted conifers trees were up to 5 feet tall and the planted willows were well established. The two attached photos show the original ground work and the same view eleven years later. For orientation, note the large hemlock in the background and the triangular openings in the background when comparing the two photos from 1991 and 2001. Also note that the man standing on the slope on the left side of the photo is the same slope that is grassed in on the 2001 photo.

Lessons Learned: Years after the project, it appears that there is little difference in stabilization between those streams that were stabilized with mats and those that were not. Also, it is important to use grass, mulch and seed over the entire length of the disturbed soils. This coverage prevents erosion and inhibits the spread of noxious weeds. It was useful to plant conifers on the slope because the grass seeding would have delayed natural regeneration of conifers because of competition. Finally, a blend of partial and full recontouring worked very well on roads constructed on glacial tills because it allows for the dispersion of water across the slope.

Photo taken in 1991 on Road 1382D in the South Fork of Gold drainage

Photo taken in 2001 on the 1382 Road in the South Fork of Gold drainage.

Roads 311 and 1104: Cache Creek

In September of 1998, portions of USFS Roads 311 and 1104 were obliterated using 10% dollars. Since the original obliteration work was completed, the road has been surveyed in 1999 and again in 2001. The review in 1999 noted a limited amount of downcutting but no significant concerns. The road review in 2001 found similar results. The photo documentation of the 2001 review shows that grasses are well established near the crossings and that the streams are stable. Grass coverage is relatively sparse between the crossings. The reviewer also noted that alder was becoming reestablished in the road prism. This road was not planted after it was obliterated.

Lessons Learned: Some of the crossings should have been pulled more deeply and more slash should have been used as mulch. Heavier application of grass, fertilizer and mulch should have occurred between the stream crossings.

Reclaimed stream crossing on "old" Road 311.

Cache Creek crossing on the “old” 311 road. On the earlier reviews in 1993, this crossing was considered a fish block. This restoration effort removed the fish block.

TYPE OF MONITORING: Effectiveness, Implementation

DISTRICT: Priest Lake Ranger District

PROJECT NAME: Road Maintenance and Improvements Monitoring behind Barriers

OBJECTIVES:

1) Identify opportunities to improve current management practices

Road Maintenance behind Guard Rails on the Priest Lake Ranger District: The Kalispell Granite Grizzly Bear Management Access Plan completed in August 1994. In the plan some of the roads on the District were proposed for closure through obliteration and others were closed with guardrails and gates. The intent of the closures with gates and guardrails was that access to these sites would be limited to the extent that Grizzly Bear habitat could be recovered. It was also understood at the time of the analysis that these roads would receive some level of maintenance.

It has been five years since the last of the KGB roadwork was completed and some of the roads are in such poor condition that aquatic resources are threatened. (See previous monitoring reports). In the 2001 field season, the district hydrologist was informed by the road maintenance of a large road failure on Road 1013. According to the road maintenance staff they were told to access the road for regular maintenance using an ATV. When they reached the failure they did not do any further review of the road because they did not have ATV access across the failure.

Road Maintenance of Road 1013 in the Upper Priest River Drainage:

Historically Road 1013 was used to connect the Priest Lake and Bonners Ferry Districts. In 1988, the very top seven miles was closed to all but administrative use. In 1996, the USFS went a step further to secure Grizzly Bear Habitat and made the decision to even more severely limit permitted traffic on this road. Since that time, it appears that road maintenance has been almost non-existent.

The District Hydrologist was joined by the Zone Fish Biologist to review the road and evaluate the existing condition in July of 2001. Later in the fall of 2001, a larger group including the District Ranger, Wildlife Biologist, Geotechnical Engineer and District Engineer attended a larger interdisciplinary review.

The large failure that was originally reported to the District Hydrologist was caused by a debris jam blocking the inlet of a pipe carrying Spread Creek. The failure caused a loss of the road prism that measured 74 feet long, 12 feet deep and 38 feet across. This failure on the road is attributed to a longterm lack of regular road maintenance of this system road. The majority of the road is very stable and is not prone to failures.

Lessons Learned: We need to improve our road maintenance behind barriers.

Inlet of culvert on Spread Creek under what was Road 1013.

Fill Failure on Spread Creek at the Road 1013 Crossing. Note: the double culverts are still crushed and underneath the failure.

TYPE OF MONITORING: Effectiveness, Implementation

DISTRICT: Priest Lake Ranger District

PROJECT NAME: Fedar Creek Slide Stabilization

OBJECTIVES:

1) Document the natural progress of revegetation on an old slide

In November of 2000, a hydrologic technician reviewed a slide that occurred in 1988 and documented the current condition. The slide originated off of the 1340 road and ended at Fedar Creek. The purpose of his review was to determine the streams response to he slide and to evaluate the current status of the slide.

According to the observer, the channel was an A5 Rosgen channel where the slide ran into the stream. The channel substrate was predominantly fine sands and gravels. Large pieces of woody debris that was moved by the slide into the channel were acting as debris traps.

The slide was naturally revegetating with a mix of conifers. Some patches of conifers were 4 to 5 feet tall. The slide its self was looking stable and appears to be healing over by its self. There is some good natural conifer regeneration that is between four and five feet high. The surveyor noted that the slide scarp was located about 15 feet below road 1340 and that there were no obvious causes of the slide from the road system. The land type on the site is a mix of 350 and 351, neither of which have particularly high mass failure potentials.

Lessons Learned: Often slides will stablize adequately without interference or assistance from well-intentioned human efforts.

TYPE OF MONITORING: Effectiveness, Implementation

DISTRICT: Priest Lake Ranger District

PROJECT NAME: Use of waterbars to prevent erosion

OBJECTIVES:

1) Attempt to limit erosion through standard use of waterbars and limiting vehicle traffic.
2) Identify solutions where problems exist with BMP implementation

Road Closures and improvements funded by the Knutsen-Vandenberg (KV) Plans:

Twelve Mile Timber Sale: Waterbars were installed on Road 2291B in fiscal year 2000. A survey of the road in August of 2001 found that the waterbars had improved the situation and that surface erosion was minimized. There was mention that additional seeding and mulching should have been done on the disturbed sites.

Castro Timber Sale: In 1996 and 1998, the District closed several roads as part of the Castro Timber Sale. The review completed in 2001 showed that the earthen barriers blocking most of the roads are being actively breached, but that damage from the ATVs is minimal. On a few of the roads, the surveyors noted that waterbars had not been installed properly. The seeding and fertilization efforts were successful but still there are a few populations of hawkweed moving into the area. Some of the roads that were closed in 1996 were only earthen barriered and all pipes were left in place.

Lessons Learned: Properly installed waterbars prevent surface erosion off of our system roads. However, we need to continue to work with all staff that is responsible for waterbars to insure proper installation. Never assume someone understands how to correctly install a waterbar. Another lesson learned was that grass seeding appears to have greatly slowed the spread of noxious weeds but did not completely halt its eventual arrival.

Appendix E: Visual Quality Monitoring Summaries - Timber Sales Closed in FY 2001		
TIMBER SALE NAME	VQO'S MET	REMARKS
Priest Lake Ranger District		
Fedar WP	Yes	
Dickensheet Powerline	Yes	
PREF Rehab		No VQO planning is done for units located within the boundaries of the Priest River Experimental Forest.
Four Corners	Yes	
Solo Grouse	Yes	
Rogers Mosquito	Yes	
Dusty Peak	Yes	This sale is not closed yet, but all units cut to date meet VQO's.
Butch Creek	Yes	
Bonners Ferry Ranger District		
Canuck Seedlings	Yes	Nursery stock and Christmas tree sale focusing on end result of a pre-commercial thinning. This sale is viewed as foreground from Road #871 in Canuck Basin. No holes, stumps, slash, or other residue is visible from the road as a result of the harvest activities, even during the summer months. The residual stand is very clumpy in nature and easily meets the required partial retention VQO.
Katamount	Yes	Shelterwood (drysite restoration and roundwood). This sale is viewed as foreground from the Katka Face Road #314. Good leave tree selection. The unit blends in well with surrounding existing 20-foot tall regeneration units. The unit was Leave Tree Marked, but all of the marks were made on the back side of the trees and are not visible from the road. The post-sale slash work has not yet been completed, which looks messy in the foreground. When this work has been completed the sale should meet the required partial retention VQO.
Katastrophe	Yes	Understory Removal (roundwood). This sale is viewed as foreground from the Katka Face Road #314. The cut trees were identified using a designation by description contract provision, meaning that no paint was required. The residual stand is fully stocked with

		clumpy and irregularly spaced leave trees. Scattered clumps of advanced regeneration were reserved for wildlife and visual purposes. All of the post sale work has been completed except for burning of the grapple piles. When this is completed the unit will easily meet the required partial retention VQO.
Katatonic	Yes	Understory Removal (roundwood). This sale is viewed as foreground from the Katka Face Road #314. The prescription, contract provisions, and logging systems were the same as Katastrophe, except more clumps of advanced regeneration were retained leaving a very pleasing view. All of the post sale work has been completed except for burning of the grapple piles. When this is completed the unit will easily meet the required partial retention VQO.
Katka Peak	Yes	This is a large sale with numerous units utilizing a wide range of prescriptions including salvage, thinning, and regeneration type cuts. The cutting units are viewed as foreground from several sensitivity level 2 roads. A small portion of the sale area is visible from U.S. 2, which is a sensitivity level one viewpoint. All of the units on the sale meet their required partial retention or modification VQO's. The VQO's were met primarily through clumpy, irregular spacing of the leave trees combined with large, landscape level units.
Katnap	Yes	Commercial Thin. This sale is viewed as foreground from the Katka Face Road #314. The cut trees were identified using a designation by description contract provision, which left no residual paint. Excellent leave trees were retained in a clumpy, irregular pattern. Prior to treatment this stand contained a very heavy component of small diameter, suppressed, poor quality trees. The only negative aspect is that the slash has not yet been treated. When this is accomplished the stand will meet the required partial retention VQO.
Knobby Pine	Yes	Basal Area Thinning (pure lodgepole pine stand). This sale is not visible as foreground

		from any open road system or as middleground or background from any population center, highway, or other sensitivity level 1 viewpoints. This, in combination with the partial cut prescription helps this sale exceed the required modification VQO.
Radar O'Riley	Yes	Understory Removal (roundwood). This sale is seen as foreground from road #229A. This road is closed part of the year. The cut trees were identified using a designation by description contract provision, leaving the largest leave trees in a clumpy, irregular pattern. A good mix of species was retained. The slash has not yet been piled, but when it is the sale will easily meet the required partial retention VQO.
Rock Bottom	Yes	This is a large sale with numerous units and a wide range of prescriptions including salvage, thinning, and regeneration type cuts. Most of the cutting units are viewed as foreground from sensitivity level 2 roads and some are viewed as middleground or background from Highway 95, which is a sensitivity level one viewpoint. All of the units meet the required VQO's through a combination of good quality leave trees, irregular leave tree spacing, and large landscape level units.
Thin Skin	Yes	This is a large sale with numerous units and a wide range of prescriptions including salvage, thinning, and regeneration type cuts. The cutting units are viewed as foreground and middleground from several sensitivity level 2 roads, with short viewing duration times because of topography and vegetation. It is not viewed from any sensitivity level 1 viewpoints. This sale incorporates large landscape units, many that engulf existing, small, rectangular shaped clear cuts from past timber sales. This project actually improved the visual appearance of the hillside visible from the Eileen Road.
Sandpoint Ranger District		
Middle Mountain	Yes	The sale as seen from the town of Clark Fork and Highway 200 meets the VQO of Partial Retention The Scotchman Peak trail view

		point has not been evaluated as yet. This will be done next field season. With some degree of interpolation the current special photo flight for the upcoming Rising Cougar project indicates that the sale will meet VQO's from Scotchman trail.
Ruened Salvage	Yes	With a VQO of Partial Retention as seen from the middle ground, the sale looks very good. All units were either salvage or a combination of salvage and thinning. The unit boundaries are very difficult to find by those who layed out and marked the sale.
Moodoo Salvage	Yes	The sale is surrounded by private land which is either fields and houses and sheds or recent logging with little regard to the visual outcome. The assigned VQO for the sale is Partial Retention as seen from the foreground (the county road). With the characteristic landscape that surrounds it, and the partial cutting prescription below the road and the open mosaic above the road, the sale meets the assigned VQO.
Upper Cedar	Yes	With the logging complete, the sale currently meets the assigned VQO of Partial Retention as seen in the middle ground from Lake Pend Oreille. Photos are on file. Much underburning remains to be done and it is anticipated that any trees killed will only improve the irregular mosaic This should be evaluated when burning is complete.
Kirby's Helicopter	Yes	Kirby's is seen in the middle ground from Lake Pend Oreille and has a VQO of Partial Retention. Much of the sale meets retention. Kirby's is currently the best example of large landscape treatments we have on the district. Photos are on file and an example can be seen on the IPNF Web site under "special projects"
Range Salvage	Yes	This sale was a salvage with some very light thinning. It has a VQO of modification. It easily meets and exceeds this VQO.
Sun Down Salvage	Yes	This sale was a salvage of some blow down trees in an existing shelterwood unit which has a VQO of Max Mod. It easily meets the assigned VQO.
Miller (salvage)	Yes	The sale cannot be seen from any significant

		viewpoints even though the VQO for the general area is Modification This is a very small sale on gentle to flat ground way off the county road.
Central Zone – Wallace and Fernan Ranger Districts		
Yellow Dog Downey	?	Under burning remains to be completed
Nilson Beetle	Yes	
Stump Jumper Heli Bug	Yes	
Barney Rubble Cabin	?	Under burning remains to be completed
Ridge Run	Yes	
West Rutherford Heli Bug	Yes	
Skookum Salvage	Yes	
Horizon Sun	Yes	Unit 35 underburn did not meet PR VQO
Bunco Bypass	?	Burning not complete
Canfield Ice	Yes	
West Hudlow Ice	Yes	
Freezeout	No	Underburn failure in unit 17
Steamboat Salvage	Yes	
Spion Kop	?	Burning not complete
South Zone – St. Maries and Avery Ranger Districts		
Safety Six	Yes	
Avery Hill	Yes	
East High	Yes	One unit yet to be burned
In Between Salvage	Yes	
Turn It Up	Yes	
Horses Aspen	Yes	
Rocket Run	Yes	Remainder of sale cancelled due to other resource concerns