Idaho Panhandle National Forests

FOREST PLAN

MONITORING AND EVALUATION REPORT

2004

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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, data 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 fiscal year 1988 through fiscal year 2004.

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 fiscal year 2003; the items are included in this year's report include:

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	Heritage Resources
F-2	Grizzly Bear Recovery
F-3	Caribou Recovery
G-1	Fry Emergence Success
G-2	Water Quality
H-1	Threatened, Endangered and Sensitive Plants
I-1	Minerals
K-1	Prescriptions and Effects on Land Productivity

This report also includes information on a number of topics not required by the Forest Plan but important to forest management. This year, these subjects include ecosystem restoration and old growth.

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 fiscal year 2004, 51.3 MMBF was offered, 59.5 MMBF was sold, and 39.6 MMBF was harvested. The number of acres sold for harvest was 8,085. Payments to counties in fiscal year 2004 totaled $8,252,061.00.

- The woodland caribou population remains stable when compared to survey estimates from previous years. Thirty-four woodland caribou were counted in the 2004 winter aerial survey. Grizzly bear habitat was little changed for fiscal year 2004, with nine of fifteen Grizzly Bear Management Units meeting all core and road density standards.

- The forest was under 10 percent allowable departure from forest plan direction in visual quality for fiscal year 2004. Sales pending completion will be reviewed upon their completion in following reports.

- The purpose of heritage monitoring is to insure that projects do not cause adverse effects to heritage resources. The threshold of concern is any unmitigated adverse impact. The forest monitors disturbing projects to identify potential impacts to heritage resources. The overall conclusion of the monitoring in fiscal year 2004 is there were no adverse effects on significant heritage resources resulting from forest projects.

- Forest monitoring of Best Management Practices (BMP) indicates that in most cases they continue to function as expected and are meeting their intent.

- 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 fiscal year 2004 are listed below. See the Ecosystem Restoration section of this report for more details.
    - Planting approximately 328,698 rust resistant white pine seedlings.
    - Planting approximately 3,292 acres of white pine, larch and ponderosa pine. These are species that are in short supply on the IPNF.
    - Reducing forest density by thinning 2,658 acres, most of this released larch, white pine and ponderosa pine.
    - Pruning 2,736 acres of white pine saplings. This reduces mortality from white pine blister rust.
    - Integrated weed treatments were accomplished on 3,549 acres.
    - There were 3,173 acres of harvest related natural fuel reduction and 9,759 acres of natural fuel reduction.
    - Improving 239 acres of soil and water resources.
    - Decommissioning 50.5 miles of roads.

- Forest plan standards call for us to maintain 231,000 acres of old growth (10 percent of our forested acres). We have identified and allocated 278,552 acres (12.1 percent of our forested

acres) to be retained as old growth. We have an additional 7,444 acres (0.3 percent 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 fiscal year 2004.

Some of the monitoring items discussed in this report are major topics to be addressed during forest plan revision. The 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 fiscal year 2004 for some of the 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	$38,793,500
Total number of employees	510 (permanent and temporary)
Volume of timber offered	51.3 million board feet
Volume of timber sold	59.5 million board feet
Volume of timber harvested	39.6 million board feet
Total acres of timber sold	8,085 acres
Payments to counties	$8,252,061.00
Total reforestation completed*	3,596 acres
Total number of seedlings planted	1,167,736
Timber stand improvement completed	2,658 acres
Pruning of white pine	2,736 acres
Soil and water improvement completed	239 acres
Roads maintained	2,273 miles
Roads constructed	6.6 miles
Roads reconstructed	172.3 miles
Roads decommissioned	50.5 miles
Trails constructed/reconstructed	15 miles
Trails maintained to standard	298 miles
Number of wildfires	143 fires
Acres burned by wildfire	83 acres
Harvest related fuel treatment	3,173 acres
Hazardous fuels reduction	9,759 acres
Wildlife habitat restored	9,398 acres
Wildlife habitat inventoried	705 acres
TES terrestrial habitat inventoried	572,400 acres
Noxious weeds treated	3,549 acres
Abandoned/inactive mines	4 sites addressed

*Includes both planted and natural regeneration that was established in 2004.

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

A. Payments to Counties

Background

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

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

Monitoring Data

Table 2. Payments to Counties with Harvested Timber Volume

Fiscal Year	Payments (MM$)	Volume (MMBF)
1991	5.4	232
1992	7.4	235
1993	6.0	134
1994	6.4	117
1995	5.8	87
1996	6.0	81
1997	3.9	57
1998	4.8	85
1999	3.1	75
2000	4.0	90
2001	8.0	51
2002	8.1	41
2003	8.1	53
2004	8.2	40

Table 3. Distribution of Payments to Counties, Fiscal Year 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 years 1991 to 2000. 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 fiscal year 2000 was collection of $15,248,318.73. Timber volume harvested in FY 2000 was 90 million board feet, which increased from 58 million board feet in fiscal year 1999. Receipts to counties in fiscal year 2000 totaled $3,991,166, an increase of $868,870 from fiscal year 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, Fiscal Year 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 fiscal year 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 county's share of the average of the three highest 25 percent fund payments made to the state during the base period (fiscal years 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. Tables 5, 6, and 7 below, show the same information for fiscal years 2002 through 2004.

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

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

Table 6. Distribution of Payments to Five Northern Idaho Counties, Fiscal Year 2003

County	Total Disbursement	% Split Title II/Title III	Title II (Forest Projects)	Title III (County)
Benewah	$117,699.00	50/50	$8,827.45	$8,827.45
Bonner	$1,418,076.00	15/0	$212,711.41	0
Boundary	$1,416,630.00	12.75/2.25	$180,620.25	$31,874.16
Kootenai	$1,032,014.00	15/0	$154,802.07	$0
Shoshone	$4,161,743.00	15/0	$624,261.43	$0
Total	**$8,146,162.00**		**$1,181,222.61**	**$40,701.61**

Table 7. Distribution of Payments to Five Northern Idaho Counties, Fiscal Year 2004

County	Total Disbursement	% Split Title II/Title III	Title II (Forest Projects)	Title III (County)
Benewah	$119,229.00	50/50	$8,942.21	$8,942.21
Bonner	$1,436,511.00	15/0	$215,476.66	0
Boundary	$1,435,045.00	12.75/2.25	$182,968.31	$32,288.52
Kootenai	$1,045,430.00	15/0	$156,814.50	$0
Shoshone	$4,215,846.00	15/0	$632,376.83	$0
Total	**$8,252,061.00**		**$1,196,578.51**	**$41,230.73**

B. Forest Service Employment

Background

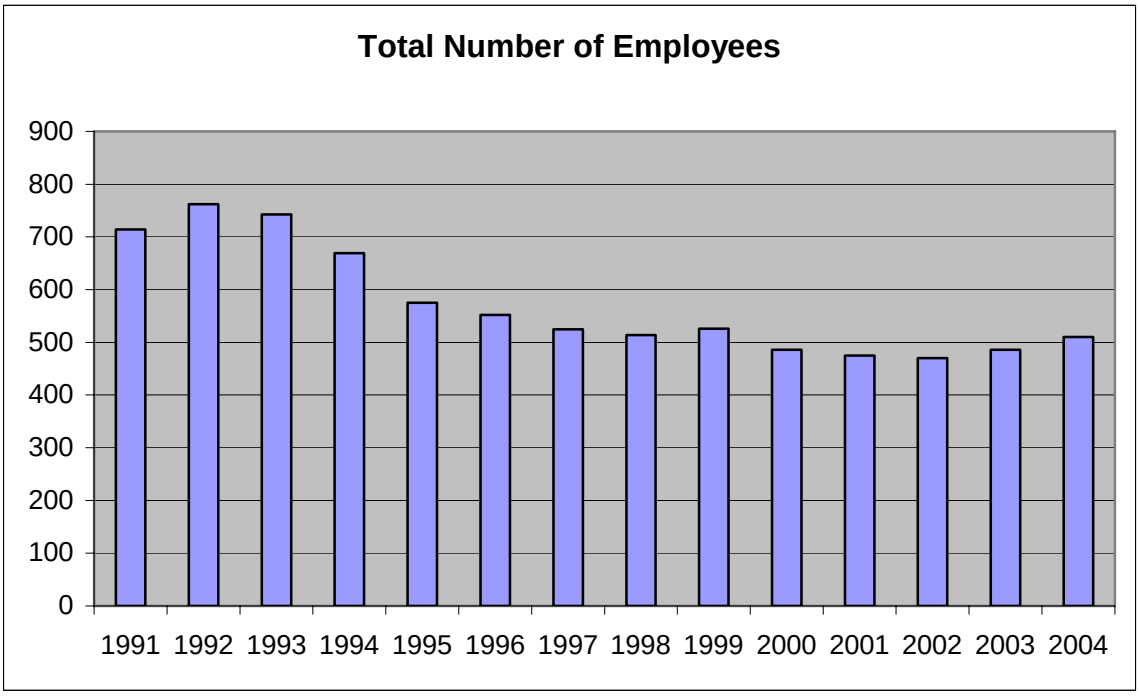
The people who work for the Idaho Panhandle National Forests spend money and contribute to the economy of the communities in which they live. As Forest Service employment goes up and down the amount of money contributed to the local economy also varies.

Monitoring Data

Table 8. Total Number of Employees

Fiscal Year	Employees
1991	714
1992	762
1993	743
1994	669
1995	575
1996	552
1997	525
1998	514
1999	526
2000	486
2001	475
2002	470
2003	486
2004	510

Figure 1. Total Number of Employees



Evaluation: Table 8 and Figure 1 show the way our workforce has changed from 1991 to 2004. We went from a high of 762 permanent and temporary employees in fiscal year 1992, to 510 at the end of fiscal year 2004. 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 Idaho Panhandle National Forests' Forest Plan established an average annual allowable sale quantity of 280 million board feet (MMBF) for the first decade the plan was in effect. This was to occur on an estimated 18,688 acres annually. The forest plan stated that depending on future conditions, the ASQ could increase to 350 million board feet a year for the second decade timber harvest level.

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

Monitoring Data

Fiscal Year 2004: For this fiscal year the Idaho Panhandle National Forests offered 51.3 million board feet of timber for sale. We sold 59.5 million board feet.

Fiscal Years 1991-2004: Table 9 depicts timber volumes offered and sold, and sale acreages for the past 13 years. Figure 2 that follows it graphically presents trends in volumes offered and sold. Figure 3 shows total acres sold.

Table 9. Timber Volumes Offered and Sold (MMBF) and Total Acres Sold

Fiscal Year	Volume Offered	Volume Sold	Total Acres Sold
1991	201.6	163.2	13,989
1992	127.2	108.0	10,508
1993	109.4	124.3	13,939
1994	44.9	16.4	4,283
1995	64.1	37.5	8,437
1996	75.4	42.9	8,631
1997	79.3	108.3	10,914
1998	76.3	90.3	6,974
1999	63.4	30.3	8,751
2000	76.3	78.2	7,332
2001	65.8	40.7	5,626
2002	57.2	55.4	5,383
2003	42.2	22.1	3,282
2004	51.3	59.5	8,085

Figure 2. Timber Volume Offered and Sold

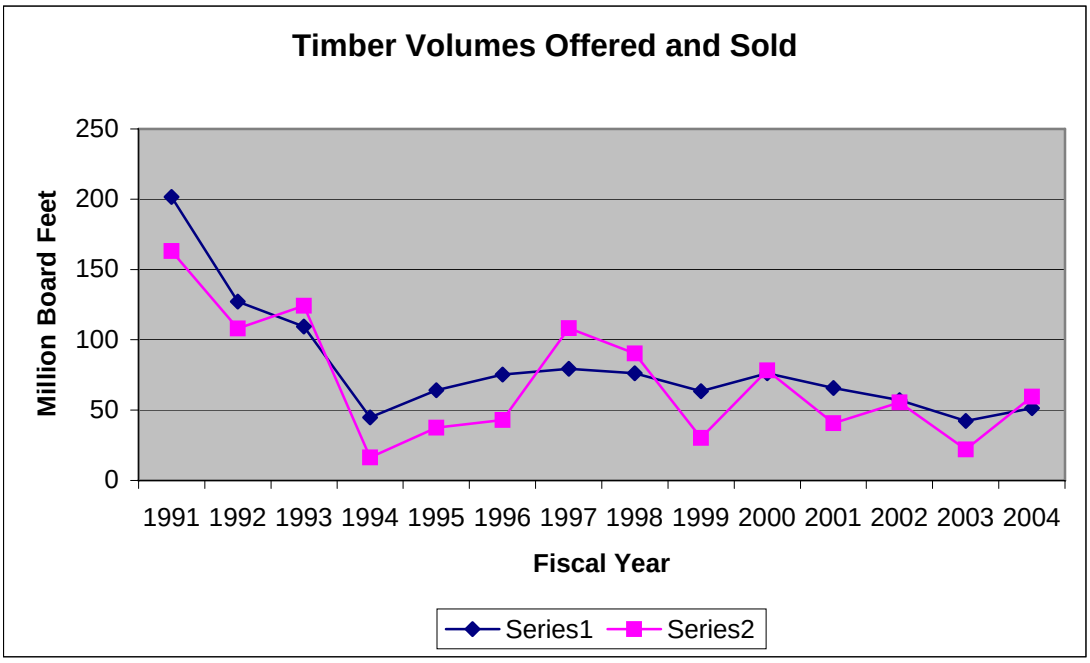
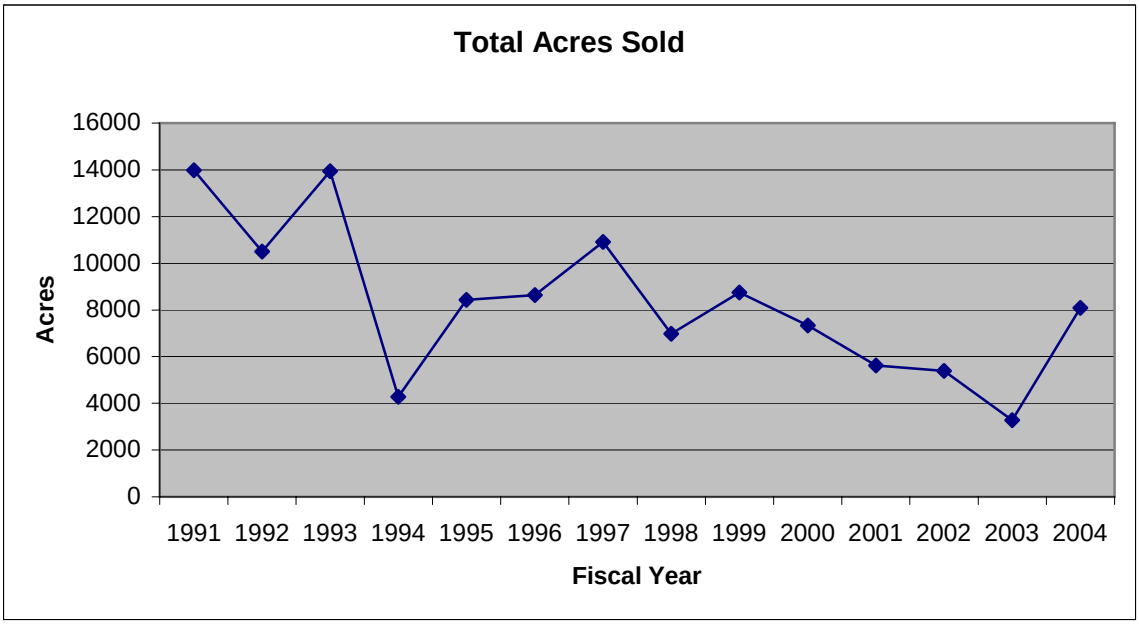


Figure 3. Total Acres Sold



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 fiscal year 1988 through 1990 the volume of timber sold and acres sold exceeded the 75-percent threshold identified in the Plan. From fiscal year 1991 through 2004 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 the Forest's 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 is one of the topics being addressed during forest plan revision.

Forest Plan Monitoring Item C-1: Visual Quality

Frequency of Measurement: Annual

Reporting Period: Fiscal Year 2004

Item C-1 requires annual assessment of effectiveness managing the Idaho Panhandle National Forests' scenic resource. The IPNFs' Visual Quality Objectives are based on *The Visual Management System,* Forest Service Agriculture Handbook Number 462. Meeting or exceeding established Forest Plan Visual Quality Objectives, commensurate with other resource requirements, is integral to Management Area goals. Detailed reports of fiscal year 2004 planning and harvest activities are available from the District Offices, upon request. The following is a summary.

Forest plan compliance with visual resource management allows 10% deviation from meeting VQO's over five year periods. The report addresses this requirement with a summary for the five-year period from 2000 – 2004. See *Meeting Threshold* table.

Table 10. ***PLANNING for Meeting Visual Quality Objectives***. Seventeen timber sales with Retention or Partial Retention units were advertised and/or sold in fiscal year 2004. All were designed to meet assigned Forest Plan VQO's. Analysis reports were completed on each of them.

PRIEST GEOGRAPHIC AREA	
Timber Sale Name	**Was project planned to meet Forest Plan VQO's?**
Kedish Ridge	Yes – (Partial Retention, Modification & Maximum Modification) sold, but work has not started.
Gleason Pine	Yes – (Partial Retention) sold, but work has not started.
57 Bear Paws	Yes - (Retention & Partial Retention) Contract not awarded yet.
PEND OREILLE GEOGRAPHIC AREA	
Timber Sale Name	**Was project planned to meet Forest Plan VQO's?**
Sam Owen Fuels	Yes. There are two distinct situations on this project - the units within the Sam Owen campground, and the units incorporating the surrounding more natural appearing forest. Salvage of hazard trees and windfell trees has been ongoing in the campground for many years. Stumps are part of the characteristic landscape in the foreground. The project will create more stumps which will be the most noticable visual impact but they will not be out of character with the existing condition.
Cocolalla West	Yes. A small portion of the sale is viewed in the foreground from the county road. Private logging, fields, houses and outbuildings, and past Forest Service logging and thinning of submerchantable trees are all part of the characteristic landscape as one drives the county road. Most of the sale activities will take

	place beyond areas which have been thinned in the past and will blend in and remain unnoticable. One area will be an introduction of forest management (thinning or group selection) into an area that has not been managed previously. The result of the treatments will borrow visually from the surrounding landscape to the extent that it will appear natural or an extention of the existing visual condition.
Hope 44 Beetle	Yes. The sale will meet VQO's. The sale is planned as a salvage of only beetle infested ponderosa pine within the Hope 44 wildfire area. All other live trees and snags not removed for safety during helicopter logging will remain on the site.
Derr 75 Thin	Yes. The project is a thinning of an immature stand which is viewed in the background from a very small portion of highway 200. It should not be evident.
COEUR D'ALENE GEOGRAPHIC AREA	
Timber Sale Name	**Was project planned to meet Forest Plan VQO's?**
Flat Roundwood	Yes. Under contract, no logging yet.
Thin Above Camp	Yes. Did not sell.
Spion Kopter Salvage	Yes. Did not sell.
Clover Thin	Yes. Logging has not begun.
South King Roadside	Yes. Met Partial Retention VQO. Bumper tree removal.
Slim Picken's	Yes. Partial Retention VQO. Did not sell.

LOWER KOOTENAI GEOGRAPHIC AREA	
Timber Sale Name	Was project planned to meet Forest Plan VQO's?
Canida	Yes. Partial Retention VQO. Advertised, not sold.
Kootenai Small Thin	Yes. Partial Retention VQO. Sold.
No Da	Yes. Partial Retention VQO. Sold.
ST. JOE GEOGRAPHIC AREA	
Bird Cage II	Yes. Retention VQO Unit #59. Harvest planned for this summer.

Table 11. ***RESULTS MONITORING of Timber Sales Closed/Completed in FY 2004***. In fiscal year 2004 twelve projects with visually sensitive units at the Retention or Partial Retention VQO were closed. The following chart provides a summary of results in meeting or exceeding VQO's.

LOWER KOOTENAI GEOGRAPHIC AREA		
Timber Sale Name	**Were VQOs Met?**	**Remarks - including harvest method**
All Spruced Up - closed 10/20/03	Yes, with one exception	This sale, implemented under the East Moyie EA (1992) involved harvesting 49 units totalling approximately 1,458 acres. 78 acres were shelterwood, 1,198 acres were commercial thin/sanitation salvage harvests and 182 acres were final removals. All but Unit 18 (38 acres, or 3% of the harvest units) met the VQOs. Unit 18 was a shelterwood harvest using skyline yarding that does not meet a Partial Retention VQO for the area. The result was a sharply defined rectangular opening with no softened or irregular boundaries that would have helped the unit appear more "natural". Any future opportunity to soften the edges of this unit with future harvest treatments should concentrate on heavily thinning out the north, south and top boundaries.

All Spruced Up Unit 18 from Addie Bridge. February 28, 2005

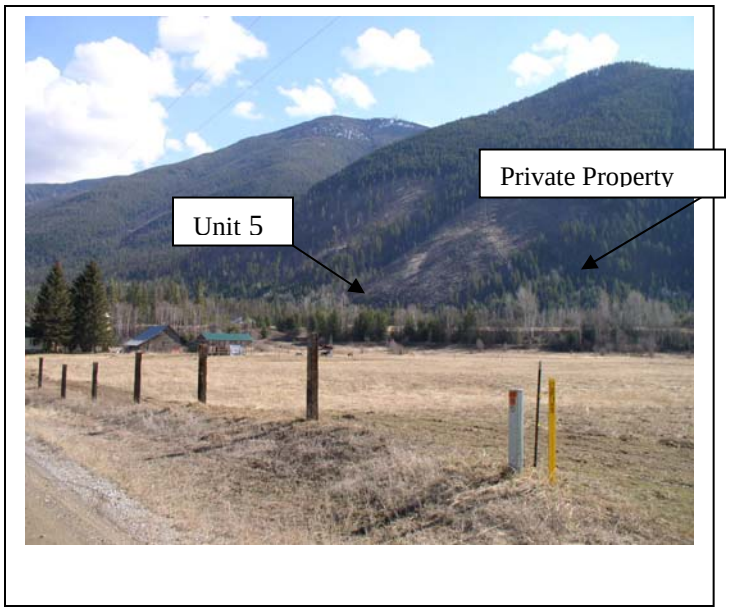
Sale Name	Were VQOs Met?	Remarks
Dawson 1-2-3 - closed 1/16/04	Yes	Pre-commercially thinned area utilizing a nursery tree contract. No apparent change in the visual character of this plantation.
West Moyie Helicopterclosed 2/2/04	Yes	This sale included 938 acres of treatments including: 850 acres commercial thin/sanitation salvage; 73 acres shelterwood with overstory retained to maintain visual quality; and 15 acres of small group selections. This was all helicopter yarded. The VQO of Partial Retention applied and was met on the entire sale. Some unit treatments actually achieved visual enhancement by opening up and exposing ground features and added color by leaving aspen trees on a mountainside dominated by continuous tree cover. The attached photos were taken of units 137 and 143 from the Meadow Creek Road near where the PGT

		pipeline crosses south of Twin Bridges and from the cement bridge that crosses the Moyie River just south of Twin Bridges.

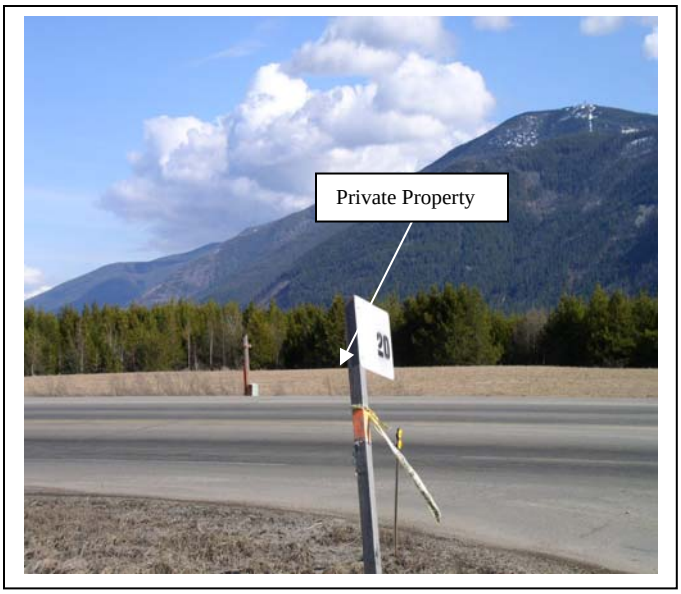
West Moyie Helicopter Unit 137. Feb. 28, 2005

West Moyie Helicopter Sale from Moyie River cement bridge south of Twin Bridges. Feb 28, 2005

Sale Name	Were VQOs Met?	Remarks
Good Grief Addie closed 2/9/04	Yes	This sale included 208 acres utilizing a combination of commercial thin/sanitation salvage/shelterwood final removal cuts that were winter logged. Commercial thinning units totaled 87 acres and were located along Meadow Creek Road near Good Grief. These were the most visually critical units and easily met the Partial Retention VQO by leaving the largest available Douglas-fir trees on an approximate spacing of 20 feet.
Beetles in Paradise closed 3/1/04	Yes, with exception	The purpose of this sale was mainly to conduct a sanitation salvage treatment to reduce the possibility of a Douglas-fir beetle epidemic. The sale treated 203 acres using helicopter yarding. There were 11 units and only unit 5 comes close to not meeting the Partial Retention VQO. Due to the existence of neighboring clearcuts on private property, Unit 5 does not dominate the landscape along the toe of the slope below Black Mountain and Clifty Peak, therefore it meets the VQO.



Beetles In Paradise T.S. Unit 5. Private property clearcut on the right. Foreground view from level 2 county road (21D). March 2, 2005.

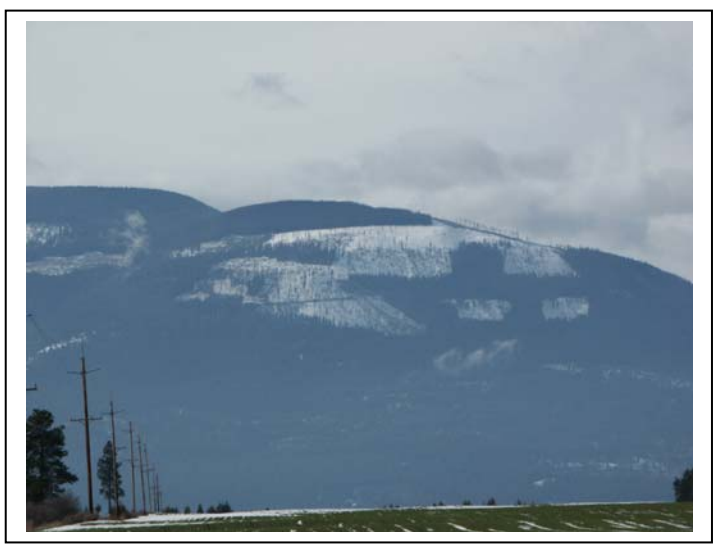


Beetles In Paradise T.S. Unit 5 not visible from Hwy 95 on top of Peterson Hill at County Rd 20.

Sale Name	Were VQOs Met?	Remarks
Rock Pine closed 9/20/04	Yes	This was one of 6 sales implemented under the Rock Bottom EA (1996) and included 360 acres of irregular shelterwood treatments to remove off-site ponderosa pine and 75 acres of commercial thinning. The entire sale removed mostly small diameter trees (i.e. less than 9" dbh). The sale easily met the Modification/Max Mod VQO along this level 3 road, and actually enhanced the visual character by thinning out doghair stands of small diameter trees and leaving the largest and healthiest looking Douglas-fir and larch dominated timber stands. One very nice viewpoint was created at the north end of the sale along Forest Road #397 that now permits a view of Brush Lake in the middle ground and the Selkirk Mountains in the background.
Smallfry closed 9/22/04	Yes	This 70 acre commercial thin was implemented under one of the new limited timber harvest categorical exclusions (December 2004). This sale easily met the VQO of Modification and actually enhanced the foreground view by exposing larger diameter Douglas-fir and orange barked ponderosa pine that were previously blocked from view by undergrowth of smaller diameter trees.

Unit 1 Smallfry Thinning Timber Sale, August 2004

Sale Name	Were VQOs Met?	Remarks
Newview closed 9/20/04	Yes	This project was implemented under the Bluegrass Bound EA (1999). The main purpose of this sale was to conduct a visual rehabilitation treatment utilizing irregular shelterwood harvest and mostly skyline yarding covering 334 acres. The existing landscape character had several clearcuts that were conducted prior to (late 70s and early 80s) implementation of the 1987 Forest Plan visual resource management standards and did not meet a Partial Retention VQO. They appeared like "postage stamps" on the mountainside. The goal of this treatment was to restore more natural appearing large openings with irregular edges that mimicked natural openings along the face of the Selkirk Mountains. Past attempts at restoration treatments around older existing clearcuts have failed because the treatments weren't aggressive enough in removing trees around the edges and restoring irregular and softened edges between openings and timber stands. The photos below show how the existing condition was transformed to more closely resemble the surrounding landscape.

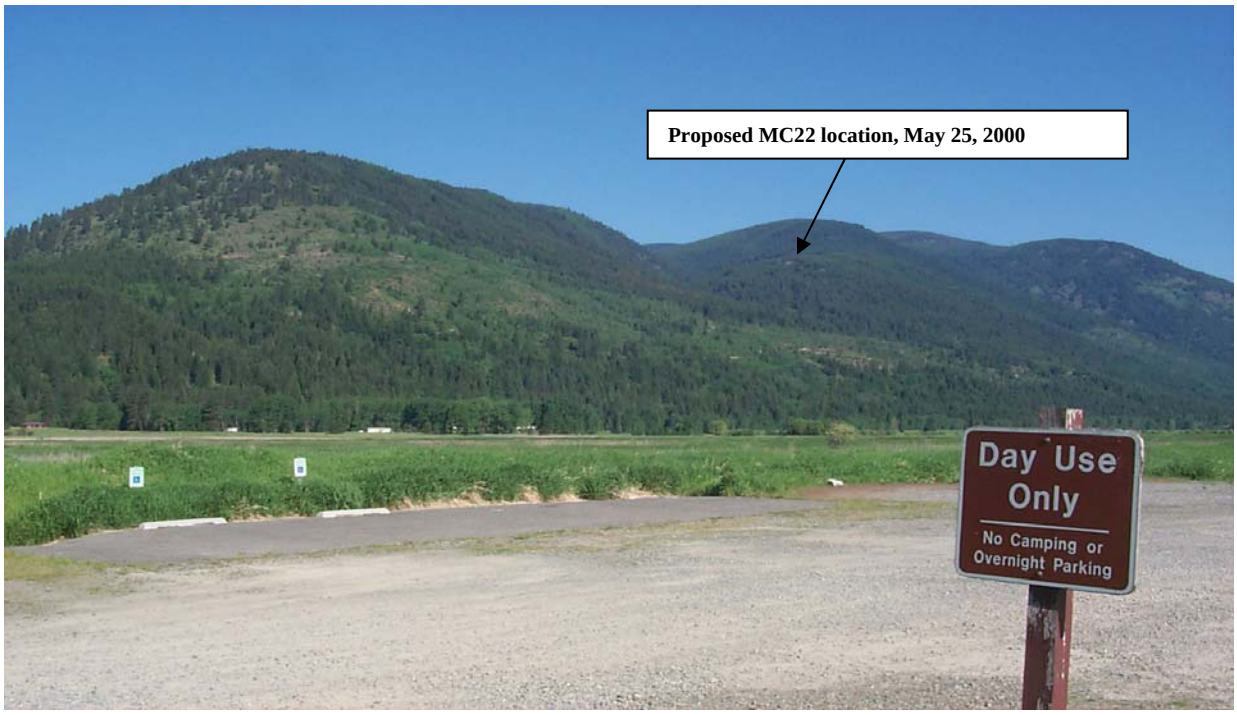


Newview, winter of 2003 after some harvesting had already started around older clearcuts.

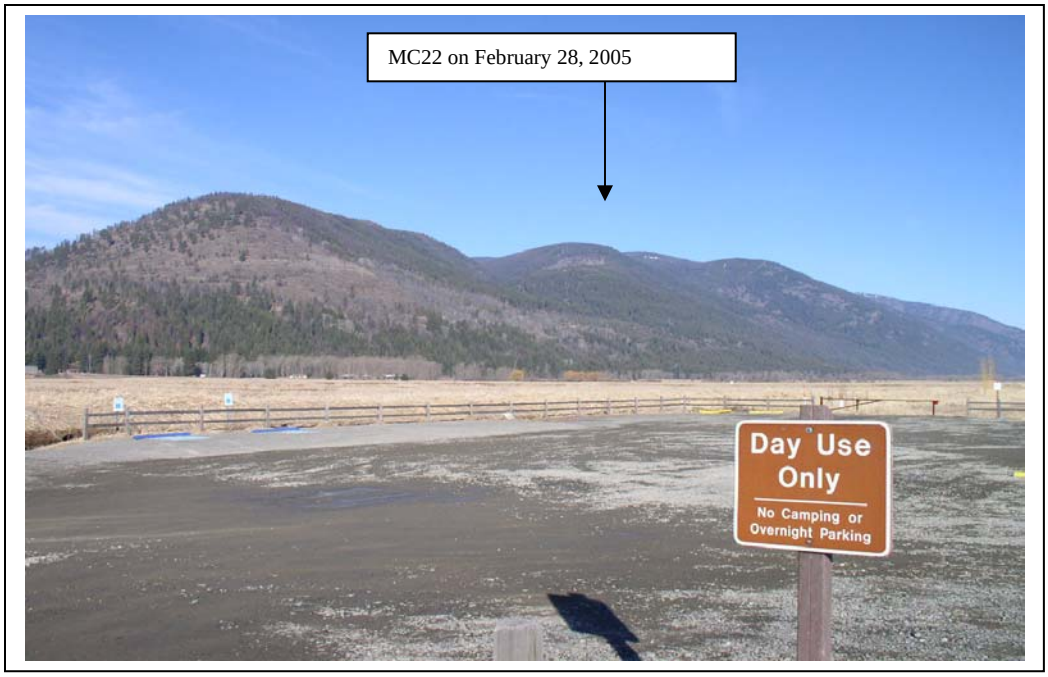
Same viewpoint on February 28, 2005. Without the accentuating snow the treatment blends with the surrounding landscape.

Newview as seen from the new Highway 95 scenic overlook near Mount Hall School. Natural openings along the face of the Selkirks to the left of the snow covered harvest units show that Newview now mimics the scale and character of the natural landscape. As these units revegetate the treatment should soften and blend even more. February 28, 2005 photo.

Sale Name	Were VQOs Met?	Remarks
Mama Cascade closed 9/27/04	Yes	The Myrtle Cascade EIS (2001) included harvest activities on approximately 1,850 acres. The Mama Cascade sale was one of two sales implemented under this EIS and the largest of the two at 1,029 acres (the other was Big Mac, which is still active). Of these 1,850 acres, 934 acres are irregular shelterwood (even-aged) and group selection (uneven-aged) regeneration harvests that were expected to result in changing the current stand characteristics from closed canopy stands to irregularly shaped open stands. Individual units are as large as 135 acres, but the openings created include clumps and stringers of large leave trees that blend with the surrounding landscape characteristics. Continuous openings vary in size from about five to ten acres and are irregularly shaped. The remaining 916 acres of the harvest activities included commercial thinning, sanitation salvage and partial overstory removal. These 916 acres created no or very minor changes in the existing visual characteristics. Just prior to completing the Mama Cascade sale, a 3,700 acre fire burned through a large portion of the sale area in 2003. One photo point used for the visual analysis shows how the fire altered the stand. If the fire hadn't occurred, the treatments would have met the VQO of Partial Retention at this location.



Myrtle Cascade Project Area as seen from Kootenai Wildlife Refuge Day Use Parking Lot. Proposed Unit MC22 located approximately half way between right hand side of natural opening and top of knob second from left.



Myrtle Cascade Project at about the 4 1/2 mile mark on Road #663. Proposed treatment will remove dense understory and improve viewing of these impressive large yellow pine. May 25, 2000.

4 1/2 miles up FR #663 on February 28, 2005, approximately 1 1/2 years after the Myrtle Creek Fire. Most of the expected residual trees shown on photo to the left were removed as dead roadside hazard trees following the fire.

Sale Name	Were VQOs Met?	Remarks
Little Corny II - closed 12/11/03	Yes	Two units lie within the VQO of Foreground/Partial Retention. The units were sky line logged, the prescription was sanitation salvage. The VQO was met.
Dutch Cat closed 11/7/03	Yes	Unit #15 was in Partial Retention and met the VQO.
Tri County closed 9/20/04	Yes	Units 9 thru 19 and units 23 and 24 fell within VQO of Middle ground/Partial Retention. Units 9, 14, 15, and 23 were clear cuts, these units were positioned in behind ridges and are not seen from the viewshed of Emerald Creek and Hwy 3 and meet the VQO of Middle Ground/Partial Retention. Units 10, 11, 12, 13, and 19 are commercial thins, units 16, 17, 18, and 24 sanitation salvage (species designation – LP removal) where the density of the canopy was minimally changed or unit location behind a ridge meets VQO objectives.

PEND OREILLE GEOGRAPHIC AREA		
Timber Sale Name	**Were VQOs Met?**	**Remarks - including harvest method**
Hope 44 Beetle	Yes	The sale was completed in April of 2004 to prevent the build-up of beetles from flying into the adjacent old growth stand. Such a small proportion of the snags and live trees were removed that there is no evidence of logging as viewed from Lake Pend Oreille or Highway 200. The sale would meet a VQO of retention.
Saddle Up Sale	Yes	The main objective for the visual resource on the Saddle Up sale was to rehabilitate the numerous old square clear cuts that could be seen from the Bunco (332) road. Since not all of the landscape was available to treat visually the success of the treatments is somewhat limited. Where the opportunity to alter straight contrasting edges of clear cuts was available we had mixed results. The goal of rehabilitaion was achieved in part and should be expanded upon on the next project in the area. Once again the ability to treat an entire ridge system (landscape) or not determines the amount of success one may expect when attempting to visually rehabilitate old clear cuts.
Jeru Sale	Yes	All harvesting is completed on the sale although it may not be officially "closed" at this time. The visual monitoring has been completed so it will be included in the '04 report. The sale met and exceeded the visual quality objectives since no evidence of the activities can be seen from the sensitivity level 2 county road. Below are photos from the only two viewpoints where a glimpse of the sale area can be had from the Upper Pack River county road.

Table 12. ***MEETING THRESHOLD from 2000 through 2004*** **.** A 10% departure from Forest Plan direction after five years initiates further evaluation.

Findings: Visual analyses were done on all projects completed in FY 2004. During the 5-year period of fiscal year 2000-2004, Visual Quality Objectives were achieved well above the allowed 10% departure.

YEAR	NUMBER OF PROJECTS COMPLETED/CLOSED	NUMBER OF PROJECTS NOT MEETING VQO	DEPARTURE FROM DIRECTION
2000	33	<1	0.02%
2001	41	0	0
2002	16	0	0
2003	10	<1	0.1%
2004	12	<1	0.1%
AGGREGATE	112	<3	<0.2%

Summary: The Idaho Panhandle National Forests were well below the 10% allowable departure from forest plan direction in meeting Visual Quality Objectives. For the five years from fiscal year 2000 through fiscal year 2004.

According to interviews conducted on the IPNF in fiscal year 2003 for the National Visitor Use Monitoring project, visitors rated scenery as very important to the quality of their recreation experience. Further, quality of the scenery surpassed expectations according to satisfaction surveys results. (National Visitor Use Monitoring Results, USDA Forest Service, Region 1, Idaho Panhandle National Forests, April 2004, pgs 18-20.) Monitoring of timber harvests on the IPNF in the last five years illustrates continued achievement of

more natural appearing patterns on the land. Landscape enhancement is more often being achieved in project areas where public concern for landscape is low to moderate. Continued predominance of shelterwood, salvage, intermediate commercial thin, and selection harvest methods is helping sustain characteristic natural forest landscapes on the IPNF. See charting of *Timber Harvest Trends Over Recent Decades* in the Fire & Human Disturbances chapter of the 2003 Idaho Panhandle National Forests Forest Plan Monitoring and Evaluation Report (pp. 102-106).

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 documented by Forest Service Law Enforcement Officers that are associated with off-road vehicle use. Listed below is the number of violations issued for fiscal year 1991 to 2004.

Table 13. Total Number of Violations Issued

Fiscal Year	Number of Violations
1991	144
1992	167
1993	204
1994	185
1995	88
1996	133
1997	240
1998	246
1999	394
2000	164
2001	285
2002	191
2003	445
2004	411

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 fiscal year 2004, 411 violations were noted.

Forest Plan Monitoring Item E-1: Heritage Resources

The purpose of this monitoring item is to ensure 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.

Vegetative Treatments (Timber Sales and Fuel Reduction Projects)

The Forest reviewed 30 projects. Eighteen of these projects required no field inventory work while twelve required field review of the proposals. The forest heritage resource staff determined that these projects would not affect heritage resources.

Roads

Four roads projects were inventoried by private contractors and reviewed by the forest heritage resource staff. None of these projects will have an adverse impact on identified heritage properties.

Trails

The Forest reviewed six trail projects. Four of these projects required no field inventory work while one required field review of the proposal. The forest heritage resource staff determined that none of these projects would adversely impact heritage resources. One project, the Pulaski Trail, is being designed as an interpretive trail to Pulaski's Tunnel, a heritage resource important to Forest Service history.

Special Use Permits

The heritage resource staff reviewed eight special use permit projects. Six of these projects required no field review. None of the projects were found to have any effect on heritage resources.

Recreation

Two projects were reviewed and both were determined to have no effect on heritage resources.

Watershed

One project was reviewed in the field by the forest heritage resource staff and determined that no heritage resources would be affected.

Wildlife

One project was reviewed and determined to have no effect on heritage resources.

Minerals and Geology

One project was reviewed and determined to have no effect on heritage resources.

Facilities

The Forest undertook two projects in 2004. Both projects were historic preservation projects involving Forest Service administrative facilities. Work on the Avery Creek Cabin to covert it in to a cabin rental continued in 2004. Work was completed on the Indian Mountain Fire Lookout, which included the replacement of the roofing. The Region One Preservation Team will continue the work on the Avery Creek Cabin in 2005.

Other Heritage Resource Accomplishments

The Idaho Panhandle National Forests continues to collaborate with the Kootenai National Forest, Parks Canada, and local groups in planning the bicentennial observance of David Thompson's achievements.

The Forest actively sponsored 2004 Idaho Archaeology Week activities in Bonner County.

The International Group for Historic Aircraft Recovery (TIGHAR) volunteered to examine the 1939 crash site of NC14935, a Lockheed Electra 10A. The group found the site but the parts of the plane had largely been salvaged over the years and little of the plane is still at the crash site.

Forest Plan Monitoring Item F-2 Grizzly Bear Recovery

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

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

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

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

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

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

Table 14. Core, Security, Road Density Standards and Guidelines - 2004

BMU	BMU Total Acres	Federal Land (%)	Lands w/in Admin. Boundary of IPNF (%)	Core (%)	Open Roads >1 i/sq.mi (%)	Total Roads >2 mi/sq.mi (%)
Cabinet-Yaak BMUs						
Northwest Peaks[1]	82,995	99	22	55 (55)	28 (33)	26 (26)
Keno[1]	51,236	99	45	61 (60)	33 (33)	24 (26)
Boulder	62,369	92	100	*49* (55)	31 (33)	*35* (29)
Grouse*	66,979	54	100	*32* (37)	59 (59)	*59* (55)
North Lightning	65,216	94	100	61 (61)	*39* (35) ↑	20 (26)
Scotchman	61,612	81	100	63 (62)	35 (35)	26 (26) ↓
Selkirk BMUs						
Blue-Grass	57,325	96	100	*51* (55) ↑	31 (31) ↓	*31* (26) ↑
Long-Smith	65,735	92	100	73 (67)	22 (25) ↑	14 (15) ↑
Ball-Trout	57,907	94	100	72 (69)	17 (20)	11 (13)
Myrtle	63,781	85	100	58 (56) ↑	31 (33) ↑	21 (22)
Kalispell-Granite	85,641	96	100	*48* (55)	29 (33) ↑	*27* (26)
Salmo-Priest[2]	87,115	99	13	65 (64)	31 (33)	26 (26)
Sullivan-Hughes[2]	78,210	99	57	*59* (61)	23 (23)	*21* (18)
Lakeshore	17,972	86	100	20 (20)	80 (82) ↑	51 (56) ↑
Le Clerc[2]	77,715	64	9	28	39	57

* Assumes no contribution to core or road densities from non-Federal lands.

( ) Represents the standards or target levels that were agreed to in the Forest Plan Amendment for Motorized Access and the associated Biological Opinion.

Italicized and underlined numbers indicate parameters not meeting Standards.

↑ ↓ Represents change from previous year

Administrative Access

All roads met management criteria for administrative access except:

- Road 246 (spring & fall season) – Grouse BMU (Forest Capital Inc. log hauling & road reconstruction).
- Road 2251 (summer season) – Blue-Grass BMU (post-sale activities for New View TS).
- Road 656 (fall season) – Kalispell-Granite BMU (brushing contract).
- Road 2516 (spring season) – Kalispell-Granite BMU (excessive unauthorized ATV use).

[1] Shared BMU and administered by the Kootenai National Forest.
[2] Shared BMU and administered by the Colville National Forest. No established standards for Le Clerc BMU.

Numerous restricted roads within grizzly bear habitat were monitored to determine the extent and nature of any unauthorized vehicle use. The monitoring technique utilized a motion sensitive counter. The length of time each road system was monitored varied. Five road systems were monitored for a total of 245 days. A total of seven violations were recorded, with one road system receiving a total of four violations within a 41-day period. Because of the monitoring technique used, the number of violations detected represents a low estimate because not all unauthorized vehicle were detected.

BMU Monitoring Summary 2004

Ball-Trout: Core: 72%: unchanged; OMRD 17%: unchanged; TMRD: 11%: unchanged.

Blue-Grass: Core: 51%: increase in core due to decommissioning of several miles of drivable roads in Grass Creek during Bear Year 2003. OMRD: 31%: a net decrease due to many of the open road discounts taken in Bear Year 2003 were not taken in Bear Year 2004. TMRD: 31%: temporary increase as a result of reopening a previously undrivable road in Boundary Creek (Rd 2450) for decommissioning.

Boulder: Core: 49%: unchanged; OMRD: 31%: unchanged; TMRD: 35%: unchanged. Open road arrangement changed slightly but not enough to change the percent reported.

Grouse: Core: 32%: unchanged; OMRD: 59%: unchanged; TMRD: 59%: unchanged.

Kalispell-Granite: Core: 48%: unchanged; OMRD: 29%: increase due to incorrectly reporting 2003 OMRD as 28% when it was, in fact, 29%; TMRD: 27%: unchanged.

Lakeshore: Core: 20%: unchanged; OMRD: 80%: increase in open roads due, in part, to mapping corrections from road validation work and, in part to temporary use of restricted (closed) roads; TMRD 51%: increase in total roads due to mapping corrections from road validation work.

Long-Smith: Core: 73%: unchanged; OMRD: 22%: increase due to incorrectly reporting 2003 OMRD as 21% when it was, in fact 22%; TMRD: 14%: increase in total roads due to mapping corrections from road validation work.

Myrtle: Core: 58%: increase in core due to mapping corrections from road validation work. OMRD: 31%: increase due to mapping corrections from road validation work. TMRD: 21%: unchanged.

North Lightning: Core: 61%: unchanged; OMRD: 39%: increase (+0.37%) as a result of mapping corrections from road validation work; TMRD: 20%: unchanged.

Scotchman: Core: 63%: unchanged; OMRD: 35%: unchanged; TMRD: 26%: decreased due to mapping corrections from road validation work. Also, the barrier at the start of FS Road 2294-UB-FDR was re-established to prevent motorized use of this road.

Forest Plan Monitoring Item F-3 Caribou Recovery

Background

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

Caribou are generally found in Engelmann spruce/subalpine fir and western redcedar/western hemlock forest types above 4,000 feet elevation in the Selkirk Mountains, but occasionally use valley bottom habitats in the Kootenai and Priest Lake Basins. Caribou are adapted to boreal forests and only occur in drier, low elevation habitats except as rare transients. Seasonal movements are complex. Caribou frequently cross the U.S. / Canada international border. Earlier in the 20th century, caribou occurred as far south as Lewiston, Idaho; now they are restricted in the lower 48 states to the northern portion of the Idaho Panhandle National Forests and northeastern Washington.

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

Forest Plan Direction

Appendix N of the Idaho Panhandle National Forests Forest Plan listed specific habitat management guidelines for caribou. New scientific data on how caribou use their habitat has resulted in a revised habitat analysis procedure. This effort and continued research on caribou habitat preferences have indicated that the forest plan's five seasonal habitats are not distinct; caribou habitats overlap in several seasons. Habitat analyses continue to support the assumption that early winter habitat in “target” condition is an important and possibly limiting factor for caribou recovery.

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

Caribou census efforts for 2004 detected 34 caribou within the Selkirk Mountain Caribou Recovery Area. Caribou were distributed primarily within British Columbia and within the Idaho portion of the recovery area. Idaho Department of Fish and Game was primarily responsible to conduct the census with support of the Idaho Panhandle National Forests. Eight caribou retain active radio-transmitter collars and are monitored by the British Columbia’s Ministry of Air, Land and Water. No caribou mortalities were detected during this monitoring period. The population remains stable when compared to survey estimates from previous years.

Three monitoring flights were conducted to monitor winter recreation use within and outside of the designated snowmobile closure areas within the caribou recovery area. The larger areas of snowmobile use were mapped and compared to previous years. No violation of any existing winter recreation closures were detected in 2004. Snowmobile use of the Abandon Creek drainage was detected after caribou had left the area in April.

Monitoring Item G-1: Greater than 80% of potential fry emergence success

This item was monitored during 1988 and 1989. After analyzing data on 25 streams using approximately 610 core samples, the conclusions were that:

- The relationship between sampled inter-gravel fines/embeddedness parameters and the amount of timber harvest and roading in a watershed was weak;
- Although there was a general trend for higher levels of inter-gravel fine sediment and embeddedness in developed watersheds, there was a lot of "scatter and variability" observed in the data;
- The emergence success levels or trends in relation to the 80 percent standard could not be determined;
- This was primarily due to too much variation with sampling techniques and natural variation of sediment within streams.

The decision was made to combine monitoring items G-1 and G-3. G-3 was expanded to include a portion of the existing core-sampling program from G-1 and additional parameters were added to determine the health of streams (USDA Forest Service 1990).

Forest Plan Monitoring Item G-2: Water Quality

Monitoring item G-2 describes the monitoring results designed to check and evaluate the effectiveness of forest management activities on watersheds, water resources, and their beneficial uses within the forest. Practices include Best Management Practices (BMP) monitoring, which cover implementation and effectiveness monitoring of activities that took place in 2004.

Water Quality and Water Resource Monitoring is intended to demonstrate that actions and practices are *implemented as designed* (implementation monitoring), are *functioning as effectively as intended* in controlling non-point sources of pollution (effectiveness monitoring), and are *achieving the objectives* of protecting water quality and beneficial uses as assumed (validation monitoring). The primary purpose of BMP monitoring is to demonstrate that BMPs (and the forest's *Soil and Water Conservation Practices*) are functioning as effectively as intended. If they do not adequately demonstrate effectiveness, then the practices may be re-evaluated and redesigned as necessary. Implementation and effectiveness monitoring on the forest during 2004 demonstrated that present and past projects were usually successful in meeting their intended objectives (also see section K-1 for further BMP monitoring results).

Since the watershed simulation program, WATSED 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. In 2004, all databases were updated with the data collected from the operational Forest Plan Monitoring gages. This information is used to validate and further and recalibrate the parameters and variables used to drive the WATSED watershed response program used by the Forest. Since recalibration is most effective using multi-year data, this year's effort was limited to updating the database. Known significant anomalies were noted.

During the 2004 field season BMP monitoring was conducted on two timber sales on the Sandpoint Ranger District. The Blacktail and Jeru/Lindsey timber sales were chosen for review because they were currently active but nearly completed. These timber sales were of a size that monitoring of the BMP's could be accomplished in 1 day for each site.

Little Blacktail Timber Sale

In Chapter 1 of the Little Blacktail EIS, the Purpose and Need states that there is a need to:

- Improve the design and drainage of existing roads to reduce the risk of sediment delivery to Cocolalla Creek.

Details of the Proposed Activities mention how risk of sediment delivery would be mitigated under two strategies. Aquatic Habitat Improvement – Drainage structures in roads that pose sediment risks would be repaired, replaced, or removed, or additional drainage structures would be installed. Road reconstruction, construction, and obliteration – Approximately 5.4 miles of temporary roads would be constructed and approximately 13.5 miles of road work would occur on existing roads to bring them up to useable standards. This road work would help reduce sediment, improve surface material, and prevent roadbed damage during wet periods. All temporary roads would be decommissioned at the end of the project.

More specifically in the Record of Decision, under Details of Alternative B, it states; Road work to Improve Aquatic Habitat: Road work will occur on approximately 13.5 miles of existing roads. Road work activities designed to reduce sediment will include spot surfacing at stream crossings, installing

relief culverts, cleaning and improving ditches, cleaning inlet and outlets of culverts, and installing rolling dips and outlet ditches. These activities will help improve drainage and decrease sediment delivery to stream channels. Drainage structures that pose sediment risks will be repaired, replaced, removed or redesigned and additional drainage structures will be installed. This will improve the water quality and fish habitat by reducing sediment production.

On the 27th of October the Little Blacktail timber sale was reviewed. The EIS and Record of Decision indicated that maintaining or improving Cocolalla Creek's aquatic habitat by reducing existing and potential sediment risks was part of the projects purpose and need. To facilitate this, road work would occur on approximately 13.5 miles of existing roads. "Road work activities designed to reduce sediment will include spot surfacing at stream crossings, installing relief culverts, cleaning and improvement of ditches, cleaning inlet and outlets of culverts, and installing rolling dips and outlet ditches". Thus, the review of the Little Blacktail sale area focused primarily on road related issues. On the day the review was conducted logging was occurring on several of the spur roads and as a result I was not all roads in the sale area were reviewed. The following is a listing of findings for each respective road segment that was reviewed.

#630 – The inside ditchline of this road has been cleaned and improved. New culverts have been installed draining the adjacent hillslope and cross-drains that drain the ditchline. See Figure #4.

Figure #4. Road #630

Numerous rolling dips have been installed and armored to drain the road surface. The road has been resurfaced with rock and is in good condition. See Figure #5.

Figure #5. Road #630

#630A – From main #630 to the 630A1 junction the road is in good shape. Ditchlines have been cleaned, the road resurfaced, and an overflow pipe installed and armored in the Cocolalla Creek crossing. See Figure #6. Logging was still occurring beyond the #630A1 junction so a review beyond this point was not conducted.

Figure #6. Road # 630A

#630A1 - Road construction is mostly outsloped. An intermittent slash filter windrow is present on the downslope side of the road. Rolling dips are present. There was some standing water on the road but the road grade is not steep enough to influence erosive flow. See Figure #7.

Figure #7. Road #630A1

#630A1a – The road stops at the top of the inner gorge of Cocolalla Creek and poses no watershed concerns. See Figure #8.

Figure #8. Road #630A1a

On the 22nd of February the Little Blacktail sale area was revisited to monitor the drainage work that had been done. No major erosion existed on the #630 road. The rolling dips that were installed were functioning well. Some lengths of the ditchline needed to be cleaned since logging debris and ice had filled it in.

#630C – This road was not accessible on the first visit due to logging operations in the area. On this visit no major erosion of the road surface was found. Some wet areas existed but will lead to no consequence due to a moderate road slope. Rolling dips were installed on the road and were functioning as designed.

Upon completing the review of roads and buffers in the Little Blacktail sale area it is apparent that the Proposed Actions listed under the Purpose and Need were adequately and effectively addressed. The main #630 road was well surfaced with coarse gravel sufficient to reduce surface erosion and drainage relief was more than adequate. Spurs roads to the #630 road had adequate drainage relief and road grades were moderate to naturally reduce surface erosion.

Jeru/Lindsey Timber Sale

In Chapter 1 of the Jeru/Lindsey EA it states that the Sandpoint Ranger District proposes to:

- Dismantle new and existing closed and open roads (except for Roads 293, 293A, 293B, 293C, 293E, and 293G) upon completion of their use for the project.

- Improve drainage relief (i.e. culverts, drain dips) and put aggregate on selected road grades and in ditchlines.

On the 3rd of November the Jeru/Lindsey timber sale was reviewed. The Proposed Action indicated that drainage relief would be improved through the use of additional culverts and drainage dips and placing aggregate on selected road grades and in ditchlines. It was also indicated that a portion of Road #293 would be relocated and the abandoned portion would be recontoured. This action item was not completed; as it was determined that larger culverts in two locations would mitigate the high risk of failure. As with the Little Blacktail timber sale much of the watershed protection issues involve mitigation of road related concerns, such as sediment addition to streams. "Road Dismantling" was mentioned for a number of existing roads upon completion of the project activities. "Dismantling includes scarifying and seeding the road surface, pulling culverts at live stream crossings, installing non-drivable waterbars tied into cut-banks, and reshaping portions of roads back to the original slope at specified locations. The following is a listing of findings for each respective road segment that was reviewed.

Road #293 – The 24" culvert that was installed at the switchback portion of the road that was intended to be rerouted has some concerns with plugging. In this location it is receiving flow from two separate drainages so the size of the drainage area as compared to the size of the pipe should be checked. Also, the drainage that drains the portion of Road #293 above this site has some erosion issues that raise a concern for debris plugging the pipe. Some portions of the ditchline need to be cleaned as they have filled with debris and are routing water onto the road surface.

Road #293F – This road has been "Dismantled". Road was recontoured for the entire length with slash over the surface. Drainage areas were restored.

Road #293G – Some of the bellholes at the culvert inlets are vulnerable to raveling due to seeps at these locations making the culverts susceptible to plugging.

Road #2748 – This road had some concerns with surface erosion and culverts. This is one of the roads that is scheduled to be dismantled. Numerous wet spots existed on this road leading to surface erosion and rutting. Most of the culverts were functioning but one had slash piled at the outlet and would likely plug before the dismantling of the road occurred.

On the 16th of March, 2005, the Jeru/Lindsey timber sale was reviewed since much of the snow in the sale area had melted. The following are notes and observations of areas of hydrologic concern and also areas that had been fixed since the initial visit.

Road #293 – The stream crossing over a small tributary to Lindsey Creek had some erosion problems. The fill material on the downstream side of the crossing on Road #293 road had acute erosion in the form of rills running the entire length of the fill and resulting in sediment deposition directly into the small tributary. Seeding and mulching along with a slash filter windrow would help remedy the problem at this site as well as correcting the surface drainage on the road. See Figure #9.

Figure #9. Road #293

Cedar slash was piled in a small perennial stream on the downhill side of a culvert. This culvert drains the hillslope at the 293F road junction. The cedar slash will not disturb the functioning of the culvert. See Figure #10.

Figure #10. Road #293

About 200 feet east of the junction of Road #293 and the dismantled Road #293F water flows from the ditch across the road at a rolling dip. This area is wet for much of the year and the road condition would benefit from having a culvert installed at this location. See Figure #11.

Figure #11. Road #293

Road #2748 – Temporary waterbars were constructed on the 2748 and 2748A roads. Snow still existed in places on both roads and the conditions were drivable, due in part to the drainage provided by the temporary waterbars. See Figure #12. The slash was removed from the outlet of one of the cross drain pipes and the potential for problems at this site was mitigated effectively by this action.

Figure #12. Road #2748

After review of the Jeru/Lindsey Timber Sale, in light of the fact that it is an active timber sale, it is apparent that the Proposed Actions listed under the Purpose and Need were adequately and effectively

addressed. Drainage concerns on the main 293 road were mitigated through road surfacing and drainage relief. Roads that have been dismantled have been rendered effectively hydrologically inert. Dismantling of roads should continue as the sale progresses.

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

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

Background

Threatened Species: Prior to 1998, only one threatened plant was listed for the Idaho Panhandle National Forests, *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 from 1998 through 2004 have failed to document populations or any highly suitable habitat in northern Idaho. The U.S. Fish and Wildlife Service removed *Spiranthes diluvialis* from the IPNF's Threatened and Endangered species list in 2004 based on the extremely low probability of it occurring on lands administered by the Forest (USDI 2004).

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 National Forests. In the spring of 2000, Botanists on the Idaho Panhandle National Forests developed a process to predict potential habitat (e.g. grasslands) utilizing the SILC (Satellite Imagery Land-cover Classification) data. Broad-scale and project level field surveys have been conducted from 2000 through 2004 to validate predicted habitat and search for populations. Potential habitat identified in proposed project areas is surveyed prior to implementation. No populations of Spalding's catchfly have been found to date on the Idaho Panhandle.

Sensitive Species: In October of 2004 the regional sensitive species list was updated, following the Region 1 Species-at-Risk Protocol. The new list contains 59 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 71 vascular plants and 8 non-vascular plants (lichens, mosses and liverworts) for the Idaho Panhandle National Forests. Generally, the USFS sensitive list contains the species most at risk on federal lands. The additional 20 species on the ICDC list can be thought of as 'species of concern'; plants that are rare at the state scale, but for which there either are: a) few identifiable threats, b) some large, secure populations, or c) no occurrences are

known for federal lands. The Species-at-Risk Protocol allows forests to also develop a "Forest Species of Concern (FSOC) List" to address some of these rare species for which there may be local concern. While no biological evaluations are prepared for these 'rare' plants as for sensitive plants, any viability concerns are addressed in environmental documents. More information on the species on the ICDC lists can be found on the internet at:

http://fishandgame.idaho.gov/tech/CDC/plants/home.cfm

Candidate Plant Species: Candidate species are those species which the United States Fish and Wildlife Service believes sufficient information is available on biological vulnerability and threats to support proposals to list them as Endangered or Threatened. Slender moonwort (*Botrychium lineare*) was listed as a Candidate species by the U.S. Fish and Wildlife Service on June 6, 2001 (USDI 2001). The only known location in Idaho is an historical occurrence documented in 1925 from Upper Priest River on Idaho Panhandle National Forests lands. This occurrence was searched for in 2002, but was not relocated. Slender moonwort is listed as 'sensitive' on the IPNF. Project clearance surveys and proactive plant surveys since 2002 have failed to locate new occurrences of slender moonwort.

Monitoring Data

Surveys: During project planning, qualified botanists assess habitats for their suitability to support sensitive and rare plants. Habitat found to be suitable within project areas, and which would be affected by project-related activities, is surveyed to determine the presence of rare plant species. Protection measures are implemented to maintain population and species viability following the National Forest Management Act and Forest Service policy. In 2004, forest botany personnel and contractors performed on-the-ground clearance surveys on 9,800 acres of high potential habitats for TES and rare plants in support of various projects including timber, fire and fuels, watershed, fisheries, KV, trails, grazing, special uses, and land exchange projects. This also includes a small amount of landscape level surveys not associated with any project. These landscape level surveys are especially important to understanding the distribution of species as they generally occur in remote areas that have a very high potential to support populations (e.g. old growth cedar groves, remote peatlands, Research Natural Areas). Often these areas are ones that likely will not have projects in the future that would require surveys.

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

Good records of the number of acres surveyed by botany personnel have been kept since 1994. From 1988 until 1993 the exact number of acres surveyed was not well documented, but is estimated to be about 5,000 acres. Prior to 1988, the Forest Service did not conduct surveys and rare plant observations reported to the ICDC were incidental. From 1994 to 2004, surveys occurred on 88,490 acres of federal lands with the express purpose of documenting and protecting rare plant populations from management activities and mitigating potential adverse effects. In 2004, 9,800 acres were surveyed for sensitive and rare plants, an increase of almost 60 percent from 2003. Recent estimates of sensitive plant habitat have determined that approximately 705,000 acres (~28%) of the total land base of the Idaho Panhandle National Forests 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 2004), which is the repository of all information relating to rare species

in the State. The information below includes some sightings on non-federal lands. However, the vast majority of observations come from lands under federal management. Sightings on adjacent private lands are important in understanding the distribution of occurrences in the ecosystem as a whole. However, there are no laws governing rare plants on non-federal lands in the State of Idaho; subsequently, few surveys have occurred on non-federal lands, and observations have generally been incidental discoveries. Between 1892 and 1987 there were 119 observations documented for rare plants in the five northern counties, on federal and non-federal lands. Since 1988, botanists and other personnel from the USFS, the Bureau of Land Management, and the Idaho Conservation Data Center have documented over 840 occurrences, of 80 rare species, mostly on federal lands. In 2004, there were 29 element occurrences reported for the five northern counties.

There were several notable discoveries of rare plants on the forest in 2004 by Idaho Panhandle National Forests and other personnel. The discoveries included six different sensitive plant species and 10 other rare plant species (FSOC). The new rare plant occurrences are displayed in the following table.

Table 15. New Rare Plant Occurrences, 2004*

Species	Common name	Status	Number of Occurrences**
Arnica alpine var. tomentosa	alpine arnica	Forest Species of Concern	1
Botrychium lanceolatum	triangle moonwort	Sensitive	1
Buxbaumia viridis	green bug-on-a-stick moss	Sensitive	1
Carex hendersonii	Henderson's sedge	Forest Species of Concern	1
Carex magellanica ssp. *irrigua (C. paupercula)*	poor sedge	Sensitive	2
Cypripedium fasciculatum	clustered lady's-slipper orchid	Sensitive	2
Dodecatheon dentatum	white-flowered shooting star	Forest Species of Concern	2
Lobaria hallii	Hall's lungwort	Forest Species of Concern	3
Mimulus clivicola	bank monkeyflower	Forest Species of Concern	3
Orobanche pinorum	pine broomrape	Forest Species of Concern	4
Petasites sagittatus	arrowleaf coltsfoot	Forest Species of Concern	5
Phegopteris connectilis	northern beechfern	Sensitive	1
Sanicula marilandica	Black snakeroot	Forest Species of Concern	4
Scirpus hudsonianus	Hudson's Bay bulrush	Sensitive	1
Streptopus streptopoides	black snakeroot	Forest Species of Concern	4
Symphyotrichum boreale	rush aster	Sensitive	4
Total new occurrences 2004			**39**

*Includes occurrences on IPNF lands only.

**Number of ocurrences is the number reported by Forest Service botanists to Idaho Conservation Data Center (ICDC) in 2004. ICDC database may group some of these sightings together.

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 2004, monitoring plots for two sensitive species - Howell's gumweed (*Grindelia howellii*) and clustered lady's slipper (*Cypripedium fasciculatum*) – were sampled. A number of sensitive peatland species were monitored in 2004 on the Bonner's Ferry Ranger District in the Grass Creek and Cow Creek monitoring plots.

Howell's gumweed (*Grindelia howellii*) occurs on the St. Joe Ranger District of the Idaho Panhandle National Forests. 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 the following table.

Table 16. Howells's Gumweed (*Grindelia howellii*) Monitoring Results, 2004

Plot/ Year	Germ/Juvenile	NFADS	FADS	Ave Flowers	Total Plants
Plot 1 1995	221	48	4	9.33	273
1996	30	99	10	11.5	139
1997	23	21	8	11.13	152
1998	21	89	20	10	129
1999	2	62	31	8.65	95
2000	2	32	21	6.7	55
2001	21	22	28	8.3	71
2002	41	27	14	5.9	83
2003	14	13	18	9.94	45
2004	14	25	8	2.5	47
Plot 2 1995	739	257	74	8.05	1070
1996	137	276	100	3.53	513
1997	415	354	33	7.36	802
1998	189	332	60	7.3	581
1999	114	214	21	4.29	349
2000	71	81	4	3.75	156
2001	22	84	6	8.5	112
2002	93	49	4	7.75	135
2003	63	48	19	10	130
2004	127	46	10	4.6	183
Plot 3 1995	No data	-	-	-	-
1996	91	166	25	5.76	282
1997	282	219	22	7.64	523
1998	Data not usable, errors		-	-	-
1999	126	306	52	4.04	484
2000	39	158	22	3.86	219
2001	99	145	41	5.1	254
2002	502	70	17	3.58	589
2003	231	29	25	3.84	289
2004	28	94	7	3.8	129

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

The population of Howell's gumweed being monitored is being impacted by competing noxious weeds and other factors. Recreational use has been noted at the site. More monitoring data are necessary before conclusions about the effects of the noxious weed treatments on population trends for Howell's gumweed can be determined.

The data for Howell's gumweed show a cyclical pattern of population demographics. Plot 3 was not established until 1996, and a sampling error in 1998 rendered the plot 3 data unusable. The trend from 1999 to 2004 is a steady decline in the total number of plants on plots 1 and 2. Plot 3 shows a fluctuation, up and down, in the total number of plants. Plot 1 went from 95 to 47 and plot 2 went from 349 to 183 and plot 3 fluctuated between 484 and 129 plants. Ten years of monitoring data for the two plots show a cyclical trend, likely a response to the same environmental stimuli: precipitation, snow-pack, etc. Concern for this species remains high and monitoring will continue in 2005. There are a total of 14 Howell's gumweed 'colonies' within an approximately two square mile area; 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.

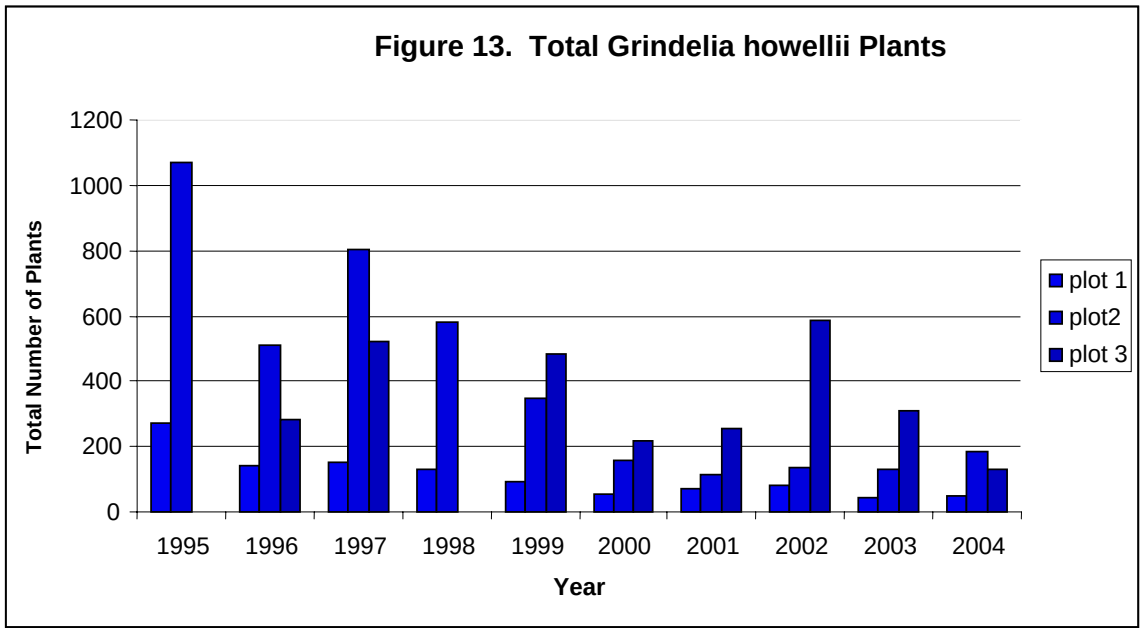
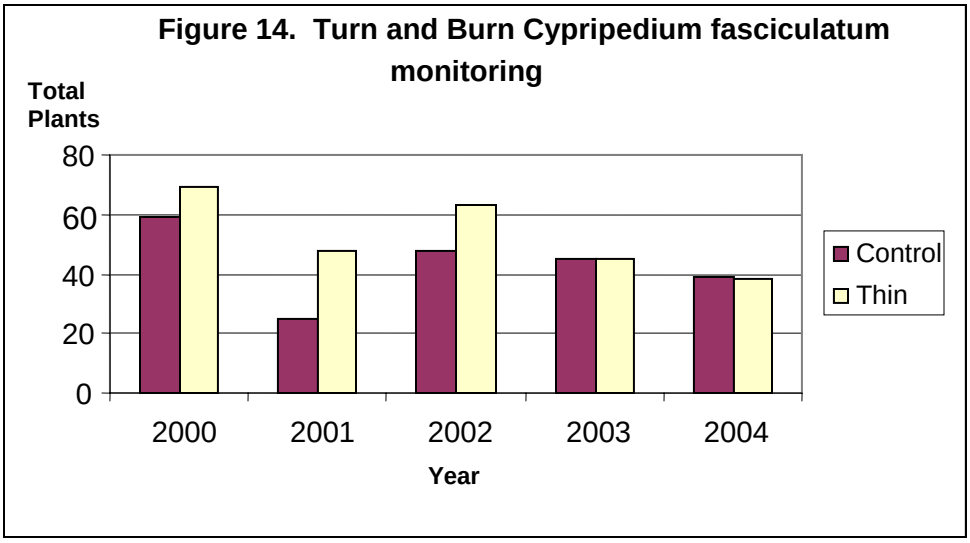


Table 17. Clustered Lady's Slipper (*Cypripedium fasciculatum*) Monitoring in the Turn and Burn Timber Sale*

Treatment	Plot Number	# Flowering	# Non-flowering	# Flowers	# Total Plants
2000 Control	**1**	7	3	19	10
	2	8	12	16	20
	3	14	15	7+	29
Thin (pre-harvest)	**1**	10	22	21	32
	2	15	15	20+	30
	3	4	3	13+	7
2001 Control	**1**	8	1	11	9
	2	8	8	12	16
	3	No data	-	-	-
Thin (pre-harvest)	**1**	8	13	13	21
	2	8	13	13	21
	3	5	1	11	6
2002 Control	**1**	9	1	18	10
	2	9	7	31	16
	3	12	10	35	22
Thin (pre-harvest)	**1**	12	21	19	33
	2	13	13	21	26
	3	4	0	7	4
2003 Control	**1**	8	1	21	9
	2	6	13	11	19
	3	4	13	5	17
Thin (pre-harvest)	**1**	14	14	23	28
	2	6	11	7	17
	3	No data	-	-	-
2004 Control	**1**	5	1	11	6
	2	6	8	9	14
	3	6	13	12	19
Thin (pre-harvest)	**1**	2	15	5	17
	2	4	6	12	10
	3	4	7	6	11

*The Turn and Burn Timber Sale has been sold and harvesting will start in 2006.

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 commercially thinned. Timber harvesting has not yet been implemented; it is planned for 2006. A + sign in the number of flowers column denotes that additional seed heads had been grazed off. There are no conclusions from this study yet, as monitoring is ongoing.



Note: Control total in 2001 is missing one plot and thin total in 2003 is missing one plot

Project: Grass Creek and Cow Creek Grazing Allotment Monitoring

Description: Botanists established monitoring plots in Cow Creek and Grass Creek on the Bonners Ferry Ranger District. The purpose of the monitoring is to determine the effects of cattle grazing within the allotments on fen habitats that support rare plant species.

Three monitoring plots were established in Cow Creek and three in Grass Creek. One control plot was established in the nearby Smith Creek Research Natural Area. The plots consisted of permanent photo points and site monitoring that indicates overall site quality, rare plant population vigor, and any damage to the habitat. The plots were established at the beginning of the grazing period in July 2004; plots were visited again as the grazing season ended in October 2004.

Pre-Grazing Results: Plots in Cow Creek had vigorous populations of the sensitive species *Trientalis arctica* and *Carex magellanica* ssp. *irrigua*. The sensitive species *Trichophorum alpinum* occurred in one plot. *Carex leptalea* was also represented.

All three plots in Grass Creek had vigorous populations of the sensitive species *Trientalis arctica* and *Carex magellanica* ssp. irrigua. *Carex leptalea* was also represented. One plot also had a vigorous population of *Trichophorum alpinum*. The populations of *T. alpinum* in Grass Creek and Cow Creek are two of only three known populations of the species in Idaho.

Post-Grazing Results: In Cow Creek, only incidental use by cattle was noted in fen habitats; most such use was associated with access by cattle to the creek. No damage by cattle to fens in any plots was noted. Some damage to fen habitat by off road vehicle use was noted.

In Grass Creek, two of the three monitoring plots had only incidental use by cattle, mostly on the margins of the fens. One plot, however, had been extensively used by cattle. Trampling of the *Sphagnum* mat was noted, and the *Carex scopulorum* that dominates the site had been heavily grazed. The fen represented by this plot is in close proximity to the road by which the cattle enter and leave the allotment.

Figure 15. Trampling by cattle in Photopoint Plot #1 in Grass Creek.

Figure 16. Trampling of *Sphagnum* mat by cattle in Photopoint Plot #1 in Grass Creek.

Besides destroying individual plants in the fen, continued trampling by cattle would likely lead to hummocking and compaction of the *Sphagnum* mat, both of which may result in localized alteration of hydrologic conditions that are unfavorable to rare plant species (Chadde et al. 1998).

Mitigation measures are being considered to ensure the continued viability of rare plant populations in Grass Creek and Cow Creek fens. Continued monitoring will help to determine the use patterns by cattle in the fens and the effectiveness of any mitigation measures that are implemented.

Conservation Strategies: ***In 2003, forest botany personnel contracted the preparation of a conservation strategy for North Idaho Peatlands. The report, completed in fiscal year 2004, will provide current information on the status, distribution, biology, threats, monitoring, and management guidelines for 33 rare peatland plant species. The strategy will also update information on 45 critical peatland sites as identified in Bursik and Moseley (1995), including threats to integrity, existing and recommended protection, conservation prescriptions, and monitoring and research needs.***

In 2004 a Conservation Assessment of Eleven Sensitive Moonworts (*Botrychium*) on the IPNF (IPNF 2004) was prepared under a contract. It provides an assessment of the current conservation status, ecology, and distribution of rare *Botrychiums* on the forest. In 2005 the Conservation Strategy portion of the *Botrychium* study will be completed. The purpose of conservation strategies is to provide information on sensitive and candidate species to ensure species viability is maintained and to prevent the need for federal listing.

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USDI U.S. Fish and Wildlife Service. 2004. Biannual forest wide species list. Reference Number 1-9-01-1-9-04-SP-219. Upper Columbia Basin Field Office, Spokane, WA.

Forest Plan Monitoring Item I-1: Minerals

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

Background

Most current mining activity on the IPNF consists of placer mining for gold in alluvial bottoms (placer mining) on the central part of the forest. There is a small amount of exploration for vein deposits of metals (hard rock mining). There is a facilitated garnet digging site on the southern part of the forest with some saleable activity for commercial garnet production.

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

Monitoring Data

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

Total Non-Bonded Non-Energy Operations Processed - 2,281 (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 - 12

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 - 16

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 - 16

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

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

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

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

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

Definitions of what is considered detrimental impacts:

- Detrimental Compaction: More than 20% increase in bulk density over natural for volcanic ash surface soils and the compacted soil must display a massive or platy structure.
- Detrimental Displacement: Removal of the forest floor and one inch or more of the surface mineral soil over a 25 ft^2 or more area.
- Severely Burned: The soil surface is in a condition where most woody debris and the entire forest floor are consumed down to mineral soil. The soil surface may have turned red due to extreme heat. Also, fine roots and organic matter are consumed or charred in the upper inch of mineral soil.

- Coarse woody-debris recommendations are as follows:
    - Douglas-fir sites need 7 to 13 tons per acre
    - Grand fir sites need 7 to 14 tons per acre
    - Western hemlock/western red-cedar sites need 17 to 33 tons per acre
    - Subalpine fir sites need 10 to 19 tons per acre

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

<u>This years monitoring focused on the following:</u>

1. Pre-harvest soil condition, organic material, and coarse woody debris on 12 timber sales.
2. Monitoring of post-harvest conditions on four timber sales
3. Monitoring of two allotments on the Priest River Ranger District and one ski run and prescribed burn on the Coeur d'Alene Ranger District.
4. Post-harvest BMP (Best Management Practices) effectiveness monitoring on four timber sales.
5. Effectiveness monitoring of slash mats on the Jeru-Lindsey timber sale, Sandpoint Ranger District.

1. Monitoring of pre-harvest conditions on 12 timber sales.

Table 18. Ranges of impacts evaluating existing conditions on 12 timber sales on the IPNF

	Existing Condition - Range of Disturbance			
Proposed Timber Sale	**0% to 5%**	**5% to 10%**	**10% to 15%**	**>15%**
Chloride Bush	3	3		
Sam Owen	1	1		
Highway 41	1			
High Bridge	1	9	6	
Blanchard Pole				
Outlet Bay	1	3		
Bussard-Feist	1			
Moyie Place	3		1	
Moyie Woods				1
Hungry Caribou		1		
Lookout Divide	3	2	1	
Carbon Center			1	
Total	**14**	**19**	**9**	**1**

Forty-four units on 12 proposed timber sales were evaluated to determine existing pre-harvest conditions and what additional mitigation recommendations needed to be made to ensure that forest plan and regional soil quality standards are met. Results showed that about half of the units had little to low existing impacts while management activities in the remaining half are close to or, such as in one case, exceeded soil quality standards. Based on these results, mitigation recommendations were provided to reduce any additional impacts that may occur from proposed activities. These include:

- Utilizing existing skid trails and landings where appropriate in order to maintain current soil compaction levels below the 15% requirement. Post-harvest, all utilized skid trails should be covered with slash and randomly placed logs (on contour) to increase the microtopography needed to reduce runoff, stabilized with waterbars, or a combination thereof.
- Avoiding operation of equipment in moist or wet depressional areas.
- Limiting logging to times when conditions are dry.
- Operating equipment on a layer of slash that can greatly reduce compaction.
- Considering winter logging.
- Operating logging equipment, including for piling slash during winter with either:
    - a 18 to 24 inch settled snow layer;
    - a combination where mineral soil is frozen at least 2 inches and a minimum of 6 inches of snow is maintained beneath the tread or wheels of operating equipment and logs dragged behind skidders; or
    - frozen ground to a depth of 4 inches with equipment operation restricted to skid trails.
- Considering post-harvest decompaction of skid trails and landings to improve the activity area and initiate recovery of soil productivity (this is a good option for units that already have an elevated existing detrimental condition).

- Changing logging system where applicable (i.e. change tractor to less impacting skyline or helicopter treatment).

Recommendation related to soil productivity:

- Overwintering slash to recycle nutrients back into the soil.
- Ensuring that enough coarse woody debris will be left to sustain long term soil productivity following guidelines in Graham et al. (1994).
- Limiting prescribed burning to those times when soil moisture is above 25% to reduce the potential for hot burns and to help maintain soil productivity.

Monitored levels of organic matter were variable in all units but generally ranged between low to optimal with occasional high values. Coarse woody debris was generally too low for six out of the 11 proposed timber sales and their evaluated units. Assessment of proposed stands or units also showed that existing available data from TSMRS does not always reflect actual conditions on the ground, which emphasizes the need for on-the-ground confirmation.

2. Monitoring of post-harvest conditions on four timber sales

Table 19. Background and monitoring results of post-harvest detrimental soil impacts on four timber sales

Timber Sale	Unit	Accomplished Year	Silvicultural Rx	Equipment	Fuels Rx	Soil Impacts %	CWD Tons/ acre
Rocket Run	4	2001	CC	Tractor	BB	4	12
	5	2001	CC	Tractor	BB	5	23
	7	2001	CC	Tractor	BB	1	18
	8	2001	CC	Cable	BB	3	15
Tri County	17A	2001	CC	Skyline	BB	7	5
	23	2001	CC	Skyline	BB		20
Lower Marble	6	2003	CT	Tractor	GP	15	9
	7	2003	CT	Tractor	Lop	8	14
	8A	2001	CC	Tractor	BB	1	14
	8B	2001	CC	Cable	BB	5	55
Little Blacktail	15	2004	GST	Tractor	Not yet complete	16	6

CC = Clearcut with reserves
CT = Commercial thin
SW1 = Shelterwood preparatory cut
GST = Group seed tree with reserves

Eleven units on four timber sales were monitored for post harvest levels of management impacts. The majority of tractor units showed limited amounts (1 to 8 percent) of detrimental soil impacts which were well below the expected (~13%) disturbance associated with such equipment. Two units were at or slightly above the standard. All skyline/cable units were above the expected (~2%) impact levels but all met forest plan and regional standards. Coarse woody debris retention was satisfactory.

3. Monitoring of two allotments on the Priest River Ranger District and one ski run and prescribed burn on the Coeur d'Alene Ranger District.

Allotments

The Upper Squaw Valley and Four Corners allotments of the Priest Lake Ranger District were monitored for livestock impacts and assessed for riparian conditions associated with grazing. Most of the grazing pressure occurs in the grassy wetland bottoms and meadows adjacent to creeks with little or no evidence of grazing or bedding on the immediate adjacent forested slopes.

Due to the steepness of some of the terrain, the majority of travel occurs on well defined trails and the road prism. Designated river crossings may add to an increase in sediments and lack of stream bank vegetation can contribute to undercuts and loss of channel stability. The Upper Squaw Valley allotment should be closely monitored for trespassing cattle to reduce the impact on soil and riparian resources.

The overall conditions of the visited sites were satisfactory. The availability of moisture in valley bottoms aids in the recovery process during and after the grazing months and likely reduces the overall impacts of cattle. In general, cattle grazing on the monitored allotments add little to no effect to existing harvest units from a detrimental soil impact standpoint. Of greatest concern is the compaction in areas where cattle concentrate over long periods of time, such as along riparian stretches in valleys, drier uplands, and around salting troughs. Though no erosion was evident, a reduction in vegetation and an increase in several weedy species were apparent.

Prescribed Burn

Table 20. Monitoring results of prescribed burn impacts on Unit 12 of the Cedar Saddle Prescribed Burn (fall of 2003), Coeur d'Alene Ranger District

CEDAR SADDLE PRESCRIBED BURN			
Hydrophobicity (%)			
	Low	**Moderate**	**High**
Unit 12	67	18	15
Control	100	0	0
Organic Matter (%)			
	<¾ inch - low	¾ to 1¾ - optimum	>1¾ - too much
Unit 12	79	9	10
Control	40	10	50
Coarse Woody Debris (tons/acre)			
12	19		

Though pockets of high burn severity (15%) were apparent and are approaching exceeding levels of detrimental impact, the overall condition of soils was generally satisfactory. This is likely due to cool burn conditions or soil moisture levels around 25%, which protected the resource from burning too hot and producing excessive hydrophobic and sterile conditions that make re-vegetation difficult over long periods of time.

Optimal organic matter levels were practically identical pre- and post burn though an overall reduction of excess organics can be seen by comparing the post-burn data to the control. The increase in shrubs and forbs should provide leafy material over the next few years and pull numbers back up towards optimal levels. However, the majority of presently growing vegetation is less desirable species such as Canada

thistle and mullein. The unit should be closely monitored for establishment of invasive species and noxious weeds.

Coarse woody debris appears to be of greatest concern. Though 19 tons/acre appears to be acceptable for this habitat type, it needs to be mentioned that the majority of debris measured was concentrated in one area. The remaining portions of the unit were almost devoid of woody debris which acts as a future long-term nutrient pool. For this unit, it appears that minimal amounts were left after harvest so that the problem lies within the logging practices rather than the prescribed burn since little evidence of large burned logs were visible, except in a concentrated area.

Ski Run

Table 21. Monitoring results of post-harvest conditions on ski run #2 at Lookout Mountain Ski Area, Coeur d'Alene Ranger District

LOOKOUT MOUNTAIN SKI RUN			
	Disturbance (%)		
Ski Run	Class 1	Class 2	Class 3
2	28	44	28
	Organic Matter (%)		
	<¾ inch - low	¾ to 1¾ - optimum	>1¾ - too much
	60	10	28
	Coarse Woody Debris (tons/acre)		
	12		

Several new ski runs were added to the Lookout Pass ski area in 2003, which involved removal of trees along several corridors on the southeast side of Runt Mountain above FR4208. A random transect along Run 2 showed increased rilling and gullying mid slope below a decommissioned old jeep road. The re-contouring was ineffective because the skid trail moves straight up the slope, and no drainage was provided along the entire face of the ski run.

Deterioration was evident, especially in the vicinity of the skid trail and below the decommissioned road. Erosion has removed several large patches of surface soil and organics and sediments are collected wherever logs cross the slope horizontally to trap the runoff. Rills can be found everywhere, i.e. 5 were measured over a 20 foot distance. Gully formation is visible just below the jeep road and some portions have already been armored with coarser fragments since fines have been removed.

The neighboring ski run (#3) was also visited over an area of about 500 to 600 feet above the main opening below. Damage is not as extensive as on the neighboring slope but rills are present, log traps are fully loaded, and no waterbars were installed anywhere, especially on the vertically running skid trail.

Recommendations to the district stressed the proper installation of waterbars following guidelines in "Ski Area BMP's", a publication specifically designed for ski area managers to prevent or decrease environmental damage and degradation of water quality. The ski area is scheduled for additional monitoring and further evaluation in 2005.

4. BMP (Best Management Practices) effectiveness monitoring on three timber sales on the Avery Ranger District.

Table 22. Results of BMP monitoring on three timber sales on the Avery Ranger District

Timber Sale	Unit	Overall Effectiveness (%)
Rocket Run	4	moderate high
	5	high
	7	high
	8	high
Tri County	17A	high
	23	high
Lower Marble	6	moderate high
	7	high
	8	moderate high

*moderate high (50 – 85%)
high (>85%)

Overall BMP effectiveness, related to the Idaho Forest Practices Act (FPA), was qualitatively rated by monitoring teams. Three units showed an overall effectiveness rated as moderately high and six units were evaluated as highly effective.

5. Effectiveness monitoring of slash mats on the Jeru-Lindsey timber sale, Sandpoint Ranger District

Log forwarder impacts in units 2, 3, and 16 of the Jeru-Lindsey Timber Sale were evaluated to determine effectiveness of slash mats on soil compaction during winter logging. Forwarder trails were entered and observed up to 400 feet away from the road. All were heavily covered by a slash mat averaging between ±1 to 3 feet in thickness, consisting of various debris from bark to large diameter logs with a general size of slash being small diameter logs and branches.

Table 23. Results and comparison of bulk densities in two units of the Jeru-Lindsey timber sale

	Bulk Density (g/cm^3)	
Unit	On skid trail	Control (unharvested, no slash mat cover)
2	0.8	0.7
	0.6	0.9
3	0.8	0.8
	0.9	0.9

Slash cover was so effective that it was difficult to find any areas where core samples for bulk density could be taken. Two small areas on forwarder trails in Unit 2 and 3 that were found uncovered by slash (but were likely covered by snow during time of harvest) were evaluated and compared with adjacent unharvested areas. Results illustrate the variability of soil bulk densities in these ash capped soils and the close results and overall appearance shows little difference and no concerns. Each of the forwarder trails entering Unit 16 were observed as well but none showed any areas on which it was feasible to take a soil

sample since no soil contact was made by the harvesting equipment. No resource damage was observed on the unit.

Duff thickness varied between 1 to 3 inches on the undisturbed forest floor and about 1 to 2 inches on the forwarder trail underneath the slash. Although the duff was more compacted over the skid trail than in the unharvested portion, no compaction of the underlying mineral soil was detected in any of the observed areas.

Some of the recommendations included reduction of fuel load and slash thickness where levels are extensive and may inhibit or slow down future vegetation and ground cover reestablishment as well as monitoring of ditches and culverts for obstruction from small debris. By and large, application of winter logging and slash mats proved to be very effective in the reduction of detrimental soil impacts from harvest equipment.

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 and old growth.

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.

Idaho Panhandle National Forests Restoration Activities, 1992-2004

Prior to completing the assessment, the Idaho Panhandle National Forests had been working to address many of these same concerns. Listed below are some of the types of activities the Forest has been working on.

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

- Approximately 3,292 acres were planted to these species in 2004. (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 1992-2004 there were 68,055 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 Idaho Panhandle National Forests 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 2004 the IPNF planted approximately 328,698 rust resistant white pine seedlings.
- From 1992 through 2004 the forest planted over 11,646,590 rust resistant white pine seedlings.

The second part of our strategy involves maintaining white pine as a forest component while they grow and mature. This includes retaining a landscape-wide, naturally breeding, and genetically diverse population of wild white pine that can develop blister rust resistance through natural selection. We have cooperated with the U.S. Forest Service, Northern Region, Forest Health Protection Staff in publishing *White Pine Leave Tree Guidelines (Schwandt and Zack, Forest Health Protection Report 96-3*. March 1996). The guidelines include pruning natural reproducing young white pine. Since the publication of these guidelines, we have also included the pruning of genetically improved planted stock. This practice has been demonstrated to reduce mortality significantly where implemented; thereby increasing the likelihood that white pine will be maintained during forest development.

- In 2004, the Idaho Panhandle National Forests pruned approximately 2,736 acres where pine is a major portion of the forest.
- From fiscal year 1992 through 2004, the Forest has pruned about 24,804 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

- 2,658 acres were thinned or released in fiscal year 2004. Most of the thinning and release was to allow shade-intolerant larch, white pine, and ponderosa pine to maintain stand dominance, or to reduce density in over-crowded stands.
- From fiscal year 1992-2004, 76,938 acres were thinned or released.

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

- There were 3,173 acres of harvest related natural fuel reduction accomplished fiscal year 2004.
- There were 9,759 acres of natural fuel reduction accomplished in fiscal year 2004.

5) Watershed Improvement

- 239 acres of watershed improvement were accomplished in fiscal year 2004.
- From fiscal year 1992 to 2004 there were 10,086 acres of watershed improvement accomplished.

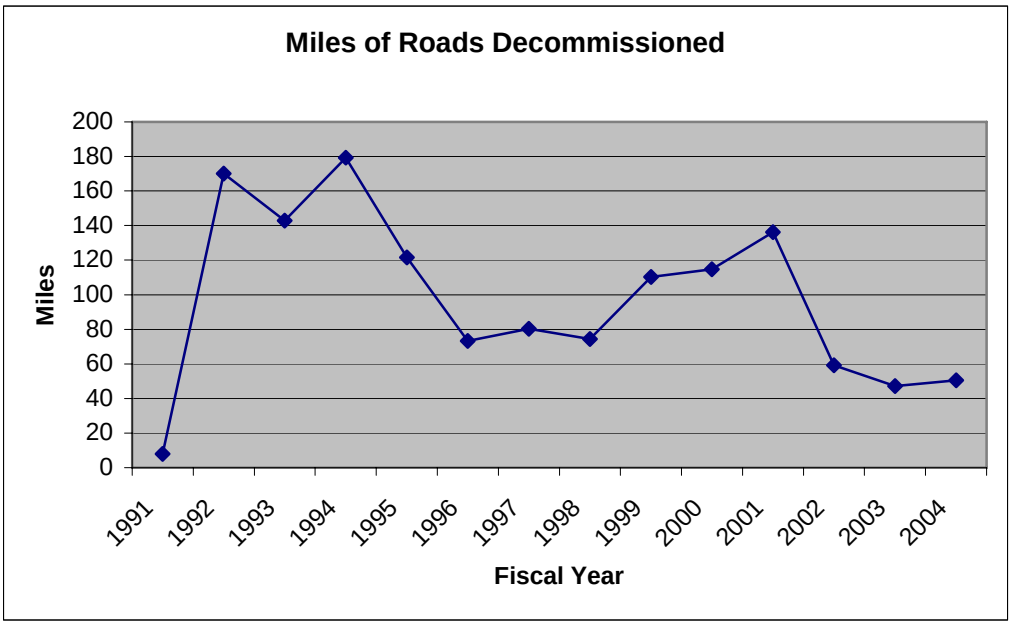
6) Road decommissioning

- There were 50.5 miles of road decommissioned in fiscal year 2004 as part of ecosystem restoration work, using a variety of funds.
- The following table shows that there were 1,367.6 miles of road decommissioning on the Idaho Panhandle National Forests from fiscal year 1991 to 2004. Classified roads are generally the ones that are inventoried, maintained and managed by the forest. The unclassified roads are not.

Table 24. Miles of Roads Decommissioned

FISCAL YEAR	CLASSIFIED ROADS	UNCLASSIFIED ROADS	ALL
1991	0	8.0	8.0
1992	141.8	28.3	170.1
1993	115.2	27.6	142.8
1994	119.3	59.9	179.2
1995	95.9	25.7	121.6
1996	58.9	14.3	73.2
1997	79.2	1.1	80.3
1998	71.5	2.8	74.3
1999	51.9	58.3	110.2
2000	91.8	23.0	114.8
2001	107.0	29.2	136.2
2002	40.2	19.0	59.2
2003	22.6	24.6	47.2
2004	48.9	1.6	50.5
TOTAL	**1,044.2**	**323.4**	**1,367.6**

Figure 17. Miles of Roads Decommissioned



Future Restoration Activities

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

- Reducing road densities, especially in areas with high densities.
- Stabilizing and improving channel stability.
- Creating openings for the reintroduction of white pine, ponderosa pine, larch and whitebark pine.
- Concentrating vegetation treatments in larger blocks, coupled with allowing other large blocks to remain undisturbed for longer intervals.
- Increasing the use of prescribed fire to reduce severe fire risk and restore the role of fire in the ecosystem.
- Restoring whitebark pine by two methods: 1) Reintroducing prescribed fire to encourage whitebark pine restoration; and 2) Collecting whitebark pine cones and testing seedlings for blister rust resistance, to begin developing blister rust-resistant whitebark pine seed sources.
- Thinning dense stands to favor white pine, ponderosa pine, and larch, and to promote large trees and reduce competition for moisture on dry sites.
- Restoring riparian areas and protecting inland native fish strongholds.
- Protecting habitat for threatened and endangered species, such as woodland caribou, gray wolf, grizzly bear, and bald eagle.
- An important aspect of our ecosystem management strategy is to focus restoration activities in priority areas where multiple ecological problems can be addressed. The objective is to improve the condition of several ecosystem components and not just a single one, such as vegetation or aquatics.

Old Growth

The 1987 Idaho Panhandle National Forest (IPNF), Forest Plan, Standard 10b. calls for maintaining "10% of the forested portion of the IPNF as old growth". The Forest Plan identified 2,310,000 forested acres on the IPNF. Therefore, the Forest Plan requires maintaining 231,000 acres of old growth. Forest Plan Standard 10a. incorporates the definitions of old growth developed by the Regional Old Growth Task Force, documented in: *Green, and others. 1992 (errata corrected 2/05). Old Growth Forest Types of the Northern Region. USDA, Forest Service, Northern Region.*

The IPNF is using a multi-scale approach to monitoring old growth, based on two separate, independent tools. These are:

1) Forest Inventory and Analysis (FIA) data used to calculate IPNF Forest-wide and mid-scale old growth percentages. (FIA old growth results for the IPNF are available for the first time this year.)
2) IPNF stand map displaying all stands allocated for old growth management, with old growth allocation recorded in the TSMRS database.

1) Old Growth Estimates from FIA Data

The National Forest Inventory and Analysis (FIA) program provides a congressionally mandated, statistically-based, continuous inventory of the forest resources of the United States. Since 1930 the FIA program has been administered through the Research and Development branch of the Forest Service, which makes it administratively independent from the National Forest System. The people who administer the FIA inventory on the IPNF are employees of the Interior West Forest Inventory and Analysis work unit, headquartered at the USFS Rocky Mountain Research Station in Ogden, Utah.

FIA inventory design is based on the standardized national FIA grid of inventory plots that covers all forested portions of the United States (all ownerships). FIA protocols specify sample plot location within this systematic grid. Both sample plot location and data collection standards are strictly controlled by FIA protocols. The sample design and data collection methods are scientifically designed, publicly disclosed, and repeatable. Data collection protocols are publicly available on the internet (http://www.fia.fs.fed.us/). There are also stringent quality control standards and procedures, carried out by FIA personnel of the Rocky Mountain Research Station. All of this is designed to assure that there is no bias in sample design, plot location, trees selected for measurement, or the measurements themselves.

FIA does not provide a 100% annual census of very tree on every acre in a national forest. With approximately 2,500,000 acres on the IPNF alone, and hundreds to thousands of trees per acre, that would not be possible. Rather, the FIA design provides a statistically sound representative sample designed to provide unbiased estimates of forest conditions at large and medium scales. This inventory design is appropriate for making estimates of old growth percentages at the scale of a national forest, or large areas of forest land. (More detail on the statistical foundation of using FIA data to assess old growth on national forests is found in: *Application of Forest Inventory and Analysis (FIA) Data to Estimate the Amount of Old Growth Forest and Snag Density in the Northern Region of the National Forest System by Raymond L. Czaplewski, Ph.D. November 5, 2004* [available from Northern Region, US Forest Service]).

Because FIA data comes from a statistical sample rather than a 100% census, we describe attributes calculated from this data as estimates and the accuracy of these estimates can be computed and reported as confidence limits. The IPNF is using a 90% confidence interval for old growth estimates. That means that if a different set of randomize sample points was collected 100 different times, the estimates of old growth amounts would be within this interval 90% of the time. This indicates that if we measured every

acre there is a 90% probability that the proportion of old growth for this entire population would be within this confidence interval. There is a 5% probability that the proportion of old growth would be less then the lower confidence limit. There is an equal 5% probability that the proportion of old growth would be greater than the upper confidence limit.

Using FIA data to assess the percent of old growth allows us to base our monitoring on an unbiased, statistically sound, independently designed and implemented representative sample of forest conditions on the Idaho Panhandle National Forest (IPNF). This inventory is reasonably current because FIA plots on the IPNF were installed during 2000 to 2004. To remain current, FIA re-measures 10% of its plots every year. As these re-measured plots accumulate, we will periodically update our FIA old growth report. Current FIA old growth estimates are presented at this time. Updated reports of old growth on the IPNF, as estimated from FIA plots, will be available in subsequent years.

FIA plot data is tested against the old growth minimum criteria in Table 1 of *Green and others (2005)*. The old growth minimum criteria are the number of trees per acre that exceed old growth minimum ages and diameters, and a minimum forest density measured as basal area per acre. The values are specific by Habitat Type and Forest Type combinations. Plots that meet old growth minimum criteria are classified as old growth. Data analysis is automated in the Forest Service, Northern Region, "FIA Summary Database".

Based on FIA data, the estimated percent of old growth on the forested lands of the IPNF is 12.85%. The 90% confidence intervals of this estimate are 10.55% to 15.27%. Given these values, we conclude that the IPNF is meeting forest plan Standard 10b. that calls for maintaining "10% of the forested portion of the IPNF as old growth".

FIA old growth percentages by ranger district also provide evidence that our old growth is well distributed across the IPNF. Note that as the sample size becomes larger, the confidence intervals are tighter. Estimates for the IPNF as a whole provide the tightest confidence intervals. Results are as follows:

Table 25. FIA Current Estimated Percent Old Growth By Ranger District

Ranger District	90% Confidence Interval Lower Bound	Point Estimate	90% Confidence Interval Upper Bound	# of Subplots
Wallace	5.9%	11.4%	17.6%	236
Avery	10.9%	16.6%	22.8%	340
Fernan	2.5%	6.3%	10.8%	224
St. Maries	0.8%	5.0%	10.5%	120
Sandpoint	5.3%	10.8%	17.2%	188
Bonners Ferry	12.9%	19.2%	25.8%	264
Priest Lake	7.2%	13.7%	20.9%	216
Total IPNF	**10.55%**	**12.85%**	**15.27**	**1,588**

2) IPNF Stand-Level Map of Old Growth

This is the first year we've had FIA old growth data available for the entire Forest. In past years we've reported forest-wide old growth results by tallying up the acres of stands allocated for old growth management, and comparing this total to the forest plan 10% standard. We continue to do that this year,

and will also compare it to the FIA old growth estimates, which have a known statistical accuracy. This comparison should provide an additional measure of the reliability of old growth monitoring results.

The IPNF stand-level old growth map represents a census of those stands allocated for old growth to meet forest plan standards. The stand-level old growth allocation allows us to distribute old growth across the ranger districts and landscape in ways that makes ecological sense at the landscape scale, and serves as a basis for project planning. This forest-wide stand map also provides a useful starting point when we are considering any management activity, and need to take a more detailed look at old growth allocations within a potential project area. The stand map also allows us to display to the public that adequate amounts of old growth are allocated and distributed across the landscape.

The IPNF stand-level old growth allocation represents a different approach to monitoring old growth than the FIA sample, and was designed and implemented independently from the FIA inventory. Forest stand information is gathered by ranger district personnel. Allocation of old growth stands is usually based on a field examination. Most old growth stands are examined with a formal systematic grid of stand exam plots that counts and measures trees on these plots. A smaller proportion of stands were allocated to old growth based on notes and measurements from of walk-thru, field verification surveys by foresters and forestry technicians knowledgeable about old growth definitions. Less than 1.5% of old growth stands were allocated from photo inventory, and all of those will be field verified before any forest management projects are carried out in those watersheds.

Ranger district stand-level old growth allocation utilizes the latest stand inventory data to assess how well stands meet the old growth definitions in the IPNF Forest Plan, as specified in *Green, and others (2005).* The old growth definitions in *Green and others (2005)* are in two parts. First, there are tables of "Old Growth Type Characteristics". These tables include both "minimum criteria" (minimum age, tree diameter, number of old large trees, and basal area) and "associated characteristics" (ranges of numbers or proportions of broken topped trees, snags, canopy layers, diameter distributions, broken tops, and large down wood). Pages 11 and 12 of *Green and others (2005)* explain that: "The minimum criteria are used to determine if a stand is potentially old growth. Where these values are clearly exceeded, a stand will usually be old growth. The associated structural characteristics may be useful in decision making in marginal cases, or in comparing relative values when making old growth evaluations." *Green and others (2005)* also warns that: "A stand should not be accepted or rejected as old growth simply on the basis of associated characteristics." The associated characteristics are <u>not</u> part of the base old growth definition. Speaking of the minimum criteria, *Green and others (2005)* further says: "Because of the great variation in old growth stand structures, no set of numbers can be relied upon to correctly classify every stand. . . . Do not accept or reject a stand as old growth based on the numbers alone; use the numbers as a guide." Second, on pages 11 and 12, *Green and others (2005)* provides guidance for incorporation of landscape ecology considerations, and a full range of resource values (including human values) in the selection of stands to be managed as old growth. Professional consideration of a wide and complex variety of factors is necessary to make old growth allocations at the stand scale.

When making old growth allocation decisions for individual stands in individual landscapes, ranger district personnel use the *Green, and others (2005)* tables of "Old Growth Type Characteristics", but also incorporate the variety of other old growth resource values and landscape design criteria, as explained in pages 11 to 12 of *Green and others (2005).* Taking these other considerations into account is fully consistent with IPNF Forest Plan standard 10c., which states: "Areas will be selected as old-growth management stands based on a combination of wildlife, cost efficiency, and other resource values (interdisciplinary process)."

In response to old growth concerns, from 1990 through 1993 the IPNF did a forest-wide inventory of old growth resources, and worked with local public Forest Watch groups to allocate and map old growth.

This is the original source of the IPNF stand-level old growth allocation and map. Since that time, we have continued to update our old growth stand allocation and map as the forest has changed by natural events, and as new information has became available.

Starting in 2001 the Idaho Panhandle National Forest began a comprehensive review of old growth data, and did some new field reviews and exams, to incorporate changes in conditions on the ground. This ongoing review, monitoring and updating of the old growth stand allocation and map results in some changes in old growth stand acres reported in annual monitoring reports over the years, in response to changing conditions on the ground and better information. These changes are evidence that we are working to keep the stand-level allocation current as conditions change on the ground. Each year's monitoring report contains the most current old growth stand information available. The stand information below was extracted from our database in March 2005, and represents the approximate situation at the end of 2004. Evaluating this stand-level old growth allocation information together with the FIA old growth estimates provides the most comprehensive picture of old growth amounts on the IPNF.

The IPNF does not do timber harvest that removes allocated old growth stands. We ceased regeneration harvest of allocated old growth stands a number of years ago. However, old growth distribution will never be entirely static because forests are living, changing natural communities. Disturbances such as fire, insects, pathogens, and weather events may reduce the amount of old growth in some areas. Meanwhile, other stands will grow and age into old growth status. The IPNF has approximately 600,000 acres of mature forest (generally dominated by trees 100+ years old), substantial amounts of which have the potential to grow into old growth in the next few decades. We will continue to update our old growth stand data in response to changing conditions on the ground, and as we obtain new information. The priority for our updating efforts will be those watersheds where we are considering management activities.

The IPNF has approximately 6,500 individual old growth stands distributed across 2.5 million acres of National Forest. It is not practical to visit every old growth stand every year. Because natural changes are going on continually (this includes both disturbances that remove old growth, and other stands maturing into old growth), information about some allocated stands may be outdated at any given time. However, to ensure that all management actions are designed based upon current old growth conditions, we take a closer look at old growth allocations within a project area whenever any management activity is being considered that could possibly impact old growth. And to ensure that we're meeting forest plan old growth standards forest-wide, we use FIA estimates to monitor the amount of old growth across the forest and at other large scales.

This forest-wide stand map provides us with stand-level information that is a useful starting point at the project scale when we are considering any management activity. Before making any management decisions that could possibly impact old growth, we take a detailed look at old growth allocations for that project area. We closely review and verify all old growth allocations within the project area, as well as review all potential treatment stands, and look for previously unidentified stands that may now meet old growth criteria. The objectives of this review are to be sure we have the best old growth allocation and landscape arrangement possible within that project area, and to be sure we're not inadvertently, negatively impacting old growth. Where appropriate, project design may also include identification of potential future old growth in the area. Project-scale review often results in changes in old growth status for a few individual stands. We sometimes find that some previous old growth stands no longer meet criteria because of insect and disease or weather mortality. However, because other stands have grown into old growth status, or because we also find previously un-inventoried old growth, this project-scale review commonly results in a net increase in old growth in the project area.

We record old growth allocations in the Forest Service Northern Region, Timber Stand Management Record System (TSMRS) database, because there are database fields and codes designed for recording stand old growth status. TSMRS is a very large Forest Service database used across the Northern Region. Any database is simply an electronic box with pre-defined fields to store specific information items. It is not possible to make meaningful sweeping general statements about the reliability of a large, widely used database. The completeness and reliability of any specific data field in any database depends upon the local effort devoted to gathering and maintaining that specific information. In the last few years the IPNF has spent over $320,000 in District-wide reviews and updating of old growth stand information in TSMRS. In addition, for all potential management projects, TSMRS old growth information is subject to additional project area review and validation (as explained above) prior to any management action on the ground. This assures that we don't, inadvertently, take any management action that negatively impacts old growth, and that all our project plans are based on the current old growth status for that project area. The old growth information currently in the Idaho Panhandle National Forest portion of the TSMRS Database has been substantially reviewed since 2001, with updates made as appropriate. Much of this updating has taken place within the last 2 years. That updating continues as the forest changes and new information becomes available.

The TSMRS database contains codes indicating individual stand old growth status. The actual stand data that's the basis of the old growth determination is found in stand exam data stored in the FSVEG database, and other information and field notes in the individual stand folders. This information is updated when new exams are done.

Our database allows us to track old growth in several categories, depending upon how it was identified in the inventory and how it is currently allocated. We separate our old growth into the "allocated" old growth stands that are specifically identified and "retained" to meet the 231,000-acre forest plan standard, and "additional" old growth that serves old growth ecological functions, even though it is not formally allocated.

"Existing Old Growth" (TSMRS Special Uses code 9) meets (and often exceeds) *Green and others (2005)* old growth minimum criteria at the stand level. "Ancient Cedar" (Special Uses code 2) is also part of our existing allocated old growth, but we track it separately because we want to take special note and care of these unique stands. "Ancient Cedar" stands contain trees over 5 feet in diameter, with ages over 500 years old; they far exceed minimum old growth criteria.

"Potential Old Growth" (Special Uses code 11) meets, or comes close to meeting a number of old growth minimum criteria, but is lacking somewhat in some criteria. However, if it is listed as "allocated", it does contribute to old growth functions at some scale. The most common situation is that the "potential old growth" has more than enough large trees to meet old growth criteria, but some of the trees are not quite old enough. However, these are usually the largest and oldest trees we have in a given area, and with a little more time can be expected to meet the age criteria as well. Some "potential old growth" is included in our old growth allocation because it is close to meeting the minimum criteria, is the best that we have available in an area, and contributes to distribution of old growth characteristics across the landscape. Other allocated "potential old growth" stands are small patches that contribute to the integrity of a larger block of old growth, or serve as part of a corridor or as stepping stones, linking two larger old growth blocks. Larger old growth patches are generally more valuable as wildlife habitat, and linkages across the landscape are important. Allocated potential old growth contributes to the functional integrity of old growth at the landscape scale, and is managed as part of our old growth allocation. This is consistent with the direction in *Green and others (2005)* about the importance of using landscape ecology considerations, as well as individual stand attributes, in selecting land to be allocated as old growth.

Old growth can be monitored by tallying up acres of stands allocated and mapped as old growth. Totals from the IPNF stand-level map are presented in Table 26. Forest Plan Standard 10b. calls for maintaining 231,000 acres of old growth (10% of our forested acres). We have identified and allocated 278,552 acres of forest stands (12.1% of IPNF forested acres) to be retained as old growth. Old growth status in 98.5% of these stands has been field verified. Clearly, the IPNF has allocated enough acres of old growth stands to meet and exceed Forest Plan Standard 10b. for the amount of old growth to be retained. We also have an additional 7,444 acres (0.3% of forested acres) of previously field examined, unallocated old growth stands, which provides old growth habitat for wildlife and serves other ecological functions.

Table 26. Acres of Old Growth Stands By River Sub-Basin

Sub-Basin (River)	**Allocated Ancient Cedar** ***(code 2)***	**Allocated Field Verified Old Growth** ***(code 9)***	**Allocated Photo Inventory Old Growth** ***(code 10)***	**Allocated Potential Old Growth** ***(code 11)***	**Total Allocated Old Growth** ***(codes 2, 9, 10, 11)***	**Additional Field Verified Old Growth** ***(code 12)***	**Total All Old Growth** ***(codes 2, 9, 10, 11, 12)***
St. Joe	1,945	58,920	971	13,160	**74,996**	7,444	**82,440**
Coeur d'Alene	208	56,216		8,836	**65,260**		**65,260**
Pend Oreille	63	19,265	55	5,208	**24,591**		**24,591**
Kootenai	516	59,737	254	5,346	**65,853**		**65,853**
Priest	1,880	40,866	2,833	2,273	**47,852**		**47,852**
Forest Total	**4,612**	**235,004**	**4,113**	**34,823**	**278,552**	**7,444**	**285,996**

If we just count the field-identified stands that correspond to the minimum criteria in Table 1 of *Green and others (2005)*, (codes 2, 9, & 12 above), regardless of allocation status, the IPNF shows 247,060 acres, which equals 10.7% of IPNF forested acres. This also meets and exceeds Forest Plan Standard 10b. for the amount of old growth to be retained, and does so without counting any of our "Allocated Potential Old Growth".

Forest Plan Standard 10i. presents "goals for lands to be managed as old-growth" within some of the timber production Management Areas. Only the four following Management Areas have specific Forest Plan old growth goals. The table below displays both those goals by management area, and what stand acres we have currently allocated for old growth. Current old growth allocations meet and far exceed these Forest Plan goals.

Table 27. Acres of Allocated Old Growth Compared to Management Area Goal

Management Area	Management Area goal: "Maintain approximately *xxxxx* acres"	Allocated Old Growth stand acres
1	25,000	97,453
2	6,000	21,644
3	400	1,880
4	4,000	13,485

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

Table 28. Old Growth Habitat Type Series Distribution

Habitat Type Series	% IPNF Acres by Inventoried Habitat Type Series	Allocated Old Growth Acres by Habitat Type Series	% of Allocated Old Growth Acres by Habitat Type Series
Ponderosa Pine	< 0.1%	0	0.0%
Douglas Fir	6.8%	7,997	2.9%
Grand Fir	14.6%	14,648	5.3%
Western Red Cedar	15.9%	50,863	18.3%
Western Hemlock	37.7%	110,646	39.7%
Subalpine Fir	15.2%	52,081	18.7%
Mountain Hemlock	9.7%	41,911	15.0%
Lodgepole Pine	< 0.1%	0	0.0%

As displayed above, old growth on the IPNF does reflect approximately the habitat type series distribution of the forest. On 79% of the land the amount of old growth is proportional to, or more than proportional to the distribution of that habitat type series. Old growth distribution is less than proportional to habitat type series distribution only in the Douglas-fir and grand fir series, which occupy the driest 21% of the land. The dry habitat type group (all of the Douglas-fir and the dry end of the grand fir series) occupies approximately 10% of IPNF land. The moist end of the grand fir series (which is still drier than the rest of the forest) covers another 11 % of IPNF land, and is often found at lower elevations and southerly aspects, and is subject to significant moisture stress during drought years.

The low proportion of old growth in these two dry habitat type series is a function of the combined effects of the huge 1910 fire and other big early 20th century fires, subsequent suppression of most low and mixed severity fires, early 20th century timber cutting, root diseases, and bark beetles. Much of the old growth inventoried on these two habitat type series is currently dominated by Douglas-fir or grand fir, which are at risk from bark beetles and root diseases. Where the moister, non-riparian grand fir habitat types are adjacent to dry sites, fires, root diseases, and bark beetles that strike the dry sites have a high probability of carrying over into adjacent Douglas-fir / grand fir stands. During drought years, grand fir growing on upland grand fir habitat types is at risk from *Scolytus* bark beetles. Active management will be necessary to restore more resilient tree species, and increase the proportion of old growth on our dry habitat types and adjacent grand fir habitat types.

The natural processes that maintained old growth on dry sites were very different than on moister sites. Historically, most of these dry forest habitat types were subject to frequent low-severity underburns and mixed severity fires that thinned out smaller trees and favored large trees of the most fire-resistant species (ponderosa pine and western larch). Frequent low-severity fires reduced the total number of smaller trees

(thus limiting moisture demands that caused tree stress on these dry sites), and reduced dead woody fuels and live ladder fuel accumulations (thus reducing the risk of stand replacing crown fires). These low and mixed-severity fires were the keystone natural process that maintained dry site old growth forest structures.

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

On these dry sites, hands-off management of existing overly dense mature and immature fir-dominated stands is not likely to increase the amount of future old growth. Active restoration by mimicking of historic disturbance processes may be necessary to meet Forest Plan standard for maintaining old growth on dry habitat types. In those places where we find dry site old growth stands with unnatural in-growth of dense smaller trees (particularly firs), we may consider restoration opportunities. Restoration may include various mixes of prescribed fire, thinning, and planting of historic shade-intolerant, fire-adapted tree species. The existing large old trees would be retained. In existing old growth, the driving objectives will be maintenance of old growth characteristics, and restoration of historic old growth structures and processes. In mature and immature stands where old growth and fire-adapted species are lacking, restoration activities may be necessary to create forests that are more likely to survive long enough to become old growth.

Summary -- Comparison of Two Tools for Monitoring Old Growth

As explained above, the IPNF is using a multi-scale approach to monitoring old growth, based on two separate, independent tools. These are:

1) Forest Inventory and Analysis (FIA) data used to calculate IPNF Forest-wide and mid-scale old growth percentages.
2) IPNF stand map displaying all stands allocated for old growth management, with old growth allocation recorded in the TSMRS database.

These two independent tools use significantly different designs, and are administered and carried out by different people. FIA old growth estimates are based on a statistically sound, representative sample of the entire National Forest, administered by the Rocky Mountain Research Station in Ogden, Utah. This sample is designed to provide unbiased estimates of forest conditions at medium and large scales. Total acres from the IPNF old growth stand-level map are a census of stands allocated for old growth management, based upon examination of selected individual forest stands for old growth characteristics. The stand inventory is carried out by IPNF Ranger District personnel. The stand-level map is a fine-scale tool that allows us to allocate old growth stands across the Ranger Districts and landscape in a way that serves as a basis for project planning.

As displayed above, the two independent Forest Service old growth monitoring tools produce remarkably similar results at the forest scale:

- **Based on FIA data, the current estimate of the proportion of old growth on the forested portion of the IPNF is 12.85%. The 90% confidence intervals of this estimate are 10.55% to 15.27%.**
- **The IPNF total acres of mapped stands allocated and maintained for old growth is 12.1% of forested lands.**

The percent of forested acres of stands allocated for old growth is well within the 90% confidence interval of the FIA inventory. From statistical perspective, at the 90% confidence level, the two numbers are not significantly different. Together, these two monitoring tools offer compelling evidence that the IPNF is meeting forest plan standards for the amount of old growth to be retained.

Both of the Forest Service old growth monitoring methods and results are fully disclosed and available to the public. FIA old growth estimates are reported annually in our monitoring report. FIA design and protocols are public information and are readily available on the FIA website. More detailed reports on methodology for estimating old growth with FIA data are available from the Northern Regional Office of the Forest service in Missoula, Montana.

The entire IPNF stand map and TSMRS database (including stand-by-stand old growth allocations) are available on the IPNF website, and are updated periodically. Project area updates are disclosed in project NEPA documents. More detailed old growth information and stand examination data has been provided numerous times over the past few years in response to various Freedom of Information Act requests by several organizations.

Appendices

A. Forest Plan Monitoring Requirements

B. Programmatic Forest Plan Amendments

C. List of Contributors

D. Water Quality Monitoring Results

Appendix A. Forest Plan Monitoring Requirements

Table 29. 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

Item Number	Standards, Practices, Activities, Outputs or Effects to be Monitored	Data Source	Frequency of Measurement	Reporting Period	Threshold to Initiate Further Action
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	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;

Item Number	Standards, Practices, Activities, Outputs or Effects to be Monitored	Data Source	Frequency of Measurement	Reporting Period	Threshold to Initiate Further Action
		0ff-site measurement; WATSED validation			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 National Forests 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 replaced 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 Idaho Panhandle National Forests disposed of 7,978.91 acres to Potlatch Corporation. The Act directed the Idaho Panhandle National Forests 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) A 1995 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 National Forest Supervisor on November 20, 1995, and the Idaho Panhandle National Forests Supervisor on January 23, 1996.

7) The most recent amendment incorporated a set of motorized access and security guidelines into the IPNF, Kootenai and Lolo forest plans to meet our responsibilities under the Endangered Species Act to conserve and contribute to the recovery of grizzly bear. The amendment applied to the Selkirk and Cabinet-Yaak Recovery Zones as well as grizzly bear occupied areas outside of the recovery zones. The record of decision was signed by the IPNF, Kootenai, and Lolo Forest Supervisors on March 23rd and 24th, 2004.

Appendix C. List of Contributors

The following individuals contributed information to this report:

Supervisors Office
Greg Tensmeyer
John Carlson
Suzanne Endsley
Dorothy Knodel
Jeff Johnson
Fely Schaible
Rick Patten
Bob Kasun
Daniela Giovanelli
Gina Rone
Ginger Swisher
Tom Martin
Jane Houghton
Jim Langdon
Cort Sims
Art Zack
Mark Grant

Bonners Ferry RD
Barry Wynsma

Coeur d'Alene RD
Jack Dorrell
Valerie Goodnow
Cathy Slinger

Priest Lake RD
Debbie Butler
Tim Layser
Jill Cobb
Matt Fairchild

Sandpoint RD
Chris Savage
Betsy Hammet
Kevin Naffin
Dave Dillon

St. Joe RD
Piper Goessel
John Macy
Steve Nelson
Suzanne Digiacomo

Appendix D
Water Quality Monitoring Results

Coeur d'Alene River Ranger District

East Fork of Eagle Creek Restoration Monitoring

In 1998 the Forest Service secured funding from the Federal Highways, Emergency Relief Funds to decommission approximately 8 miles riparian /encroaching road (FS Road 152) in the East Fork of Eagle Creek following a flood event of 1997. Eagle Creek is a tributary to Prichard Creek which is a tributary to the North Fork of the Coeur d'Alene River. This flood event scoured and removed segments of Road 152.

The restoration project accomplished the following targets:

- 33 culverts removed
- 2,750 linear feet of road removed
- 1,550 linear feet of road fully re-contoured
- 1,250 feet of partial road re-contouring (creation of an ATV trail)
- 5 stream channel crossings restored
- 5 armored rock fords installed
- 59 rock bank barbs installed
- 10.4 acres of seeding and mulching

The Project Objectives were to eliminate the risk of coarse (and fine) sediment from road failures in the East Fork of Eagle Creek, improve channel stability, and enhance fish habitat.

The engineering and aquatics departments collaborated on road decommissioning and in-stream channel structure design 1998. Photo-monitoring was initiated in 1997 after the flooding with repeat photos were taken right after completion of the restoration work in 1988. Photo points were once again taken in the summer of 2004 to look at stream channel stability, effectiveness of channel structures and vegetative response. Stream side vegetative responses were also evaluated, six years after implementation of the project. The overall effectiveness of this restoration was good and the overall objectives were nearly completely met.

Site 49 is located approximately 0.5 miles past the junction with the 805 Road. This is the most downstream site and the flood of 1997 washed out a large volume of road material. The restoration work involved constructing several rock barbs and placing small woody debris and slash along the banks. In 2004 the rock barbs were still intact and some new large woody debris moved into the streams edge creating a small log jam. The fine slash that was placed along the banks has shifted or moved off site with high flows. Overall fish habitat has improved. There is an ATV trail along this lower segment of stream under special use permit to access private mining claims. The tread of this trail is stable and does not contribute coarse sediment or present a risk of failure. Vegetative response has been good with grasses, sedges, willow, and alder now well established along this restored site. A 50-inch ATV tread remains un-vegetated and may contribute small amounts of fine sediment during intense storm events or snowmelt. There are very few erosive, fine grained soils along this stream bottom because of the alluvial nature of the valley bottom.

Site 39 is located approximately 1.0 miles past the junction with the 805 Road. This site was washed out in the flood of 1997. The restoration work involved installing several rock barbs along one bank of the stream. In 2004 the rock barbs were still intact except for the out tips of the structures. The outer three

or four boulders of each structure were mobilized with recent high flows and moved downstream. This probably resulted from the boulders being too small or not being anchored deep enough into the stream bed. It was observed that deposition has been the predominant function along this stream bank since the restoration and cobble/gravel size material now occupy more channel capacity than it did right after rehabilitation. The channel has responded to this deposition by migrating several feet towards the opposite bank scouring a new thalweg away from the structures. The overall channel is more stable than pre-restoration conditions and the objective of eliminating potential road failure has been fully met. Vegetative response has been excellent with grasses, sedges, willows, and alder well established along the restored site.

Figure 18. Site 49, 1997 - after flooding

Figure 19. Site 49, 1998 - after restoration

Figure 20. Site 49, 2004 - 6 years after restoration

Figure 21. Site 39, 1997 - after flooding

Figure 22. Site 39, 1997 - post–rehabilitation with angled rock barbs

Figure 23. Site 39, 2004 - 6 years after rehabilitation

Teepee Wetland Monitoring

In the year 2000 the Forest Service received money to create a wetland in the Tepee Creek floodplain. This project was designed to replace wetlands that were filled in when the Bunco Road was widened. The goal was to create three acres of self-sustaining wetland through floodplain excavation and planting of riparian plant species.

The engineering and aquatics departments collaborated on a wetland design package in 2001. A 2.8-acre wetland was created adjacent to an intermittent stream. The wetland was expanded from a small pond that was created as a part of the Tepee Creek stream restoration project. The wetland was constructed in a circular pattern with a concave bottom. The sloped perimeter has a width of 30 feet and the interior has a total area of 1.1 acre. Circular sections of floodplain were left at their original elevation to create four island areas in the wetland. Moats were dug around each island to enhance diversity. The islands act as secure resting stations for waterfowl. Small piles of wood were placed on each island and throughout the wetland interior at random locations. Woodpiles provide hiding places for small mammals. Two snags were buried vertically in the wetland floor to provide bird perches. The wetland was completely excavated during the fall of 2001.

Immediately following construction activities a photo-monitoring plan was developed and baseline pictures were taken of the wetland. The pictures have been repeated in June 2002, 2003, 2004 and September 2002 and 2003 after contractors planted the wetland. Stake rows were not set up due to lack of funding. We will monitor growth and survival of plants through visual observation and comparing photographs that will be taken in June and September for the next five years. Native plants were collected during December of 2001 under the district botanist's direction. The plants were taken from an area in close proximity to the project area. Fourteen hundred black cottonwood (Populus trichocarpa) and 3,600 willow whips were collected and taken to the Forest Service Nursery for propagation. The nursery produced 1,875 cottonwood and 5,498 willow 12 to 30 inches in height. Most of the native sedge (Carex utriculata) seed collected close to the wetland failed to germinate. Sixty sedge plants were delivered from the Forest Service Nursery. Plants were ordered from Plants of the Wild in Tekoa Washington to supplement our inventory. Two hundred and fifty mountain alder (Alnus incana), 1,500 beaked sedge (Carex utriculata), 280 small-fruited bullrush (Scirpus microcarpus), and 343 water sedge (Carex aquatilis) were purchased. Nine thousand plants were planted in the wetland during fall 2002. The district botanist developed the following planting regime:

- The wetland perimeter was planted with willow and cottonwood on a 3 foot by 3 foot spacing. Mountain alder was scattered throughout the willow and cottonwood.

- The wetland interior was planted with willow and cottonwood on a 4 foot by 4 foot spacing. Areas with 2 inches of standing water were staked and clumps of bullrush and sedge were planted on a 1 foot by 1 foot spacing within a 25 foot circle.

After visually observing the wetland in 2004 it was determined that the survival rate for planted species was approximately 25%, and the wetland is 90% filled in with plants and grasses from natural regeneration.

Some resource damage has occurred due to ATV travel in the Tepee Creek floodplain and wetland area. The Forest Service placed an earth berm on an access road to prevent ATVs from accessing the area.

Figure 24. An overview of the wetland, 2002

Figure 25. An overview photo of the wetland, 2004

Figure 26. Looking south at wetland interior, 2003

Figure 27. Looking south at wetland interior, 2004

Figure 28. Looking southwest at wetland interior, 2003

Figure 29. Looking southwest at wetland interior, 2004

Figure 30. Looking west at wetland interior, 2003

Figure 31. Looking west at wetland interior, 2004

Figure 32. Looking north at wetland interior, 2003

Figure 33. Looking north at wetland interior, 2004

Priest Lake Ranger District

Jill J. Cobb
District Hydrologist
February 28, 2005

Sediment Reduction Project

In August 2003, the Priest Lake Ranger District implemented a project to reduce a chronic sediment source to the mainstem of the Lower West Branch. This specific site was identified by the Idaho Department of Environmental Quality as the number one source of sediment for the Lower West Branch (LWB) drainage. The LWB is identified as a Water Quality impaired stream on the 303(d) list.

The site has been used by a few locals as a gathering spot and unfortunately some individuals have been driving across the channel to park on the opposite bank. The result of the intensive use of this site is that a considerable amount of sediment has been delivered to the Lower West Branch and the site was actively eroding. As depicted in the accompanying photos, some of the rills in the road leading into the crossing were up to 2 feet deep and ran over 100 feet up the hill.

Figure 34. Lower West Branch Access Site

Pretreatment (2001)	Post Treatment (2004)
	

To arrest the erosion from the site, we filled the site with rock and created small rock berms all the way down to the base of the slope. To stop four wheel drives from damaging the sensitive stream bed and channel banks, we lined the site with large boulders. The spacing of the boulders allowed access to the stream by people and horses but not motorized 4 wheel drive vehicles. As a final step, the entire site was treated for weeds, seeded and fertilized.

The outcome of the project is that the site is very stable, no four wheel drives are crossing the stream, no sediment is moving down the slope, the weed population is diminished and the site is well grassed. Unfortunately, ATV users have cut a new route to the stream through the brush. To discourage that use by ATVs, the District will strategically place large boulders on obvious access routes with a future project.

Figure 35.

Boulders lining the stream access (2004)	Successful Revegetation (2004)
	

Stabilizing Culvert Headwalls

The Lakeshore Road was improved as a joint effort by Bonner County, DEQ, and the Forest Service. The project was originally completed in 2002. In 2003, the district noted that the culvert headwalls were not stable and thus required the county to rock the headwalls. The result is that the erosion of the headwalls was arrested and the site is stabilized.

The district hydrologist and district engineer have been working together to design culvert inlets that are maintained to prevent sloughing and reduce the sediment delivery to ditches and streams. Such efforts allow maximum life of the road and minimize maintenance costs and minimize sediment delivery to streams and ditch lines.

Figure 36. Lakeshore Road

Pretreatment (2002)	Post Treatment (2004)
	

Cache Creek Road Obliteration

In 1998, Road 311 on the Priest Lake District was put into storage to improve Grizzly Bear security and reduce the risk of culvert failure. The road is located in the South Fork of Granite Creek drainage, within the Kalispell Granite Bear Management Unit. On Road 311, 38 culverts were removed, and most of the road prism was only lightly scarified. The intention of the original prescription was to create a hydrologically inert road that could be reopened in the future should the need arise.

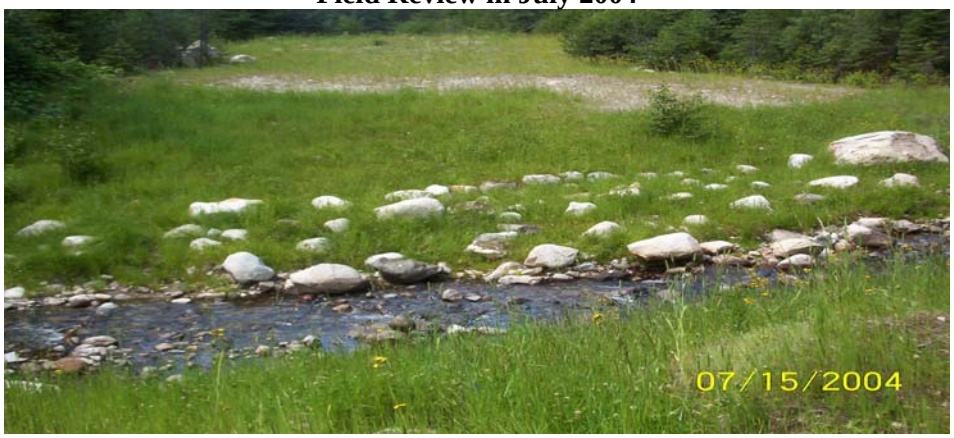
The crossing depicted in the photos below shows Cache Creek. The Cache Creek culvert was 60 inches in diameter and had a three foot fill on the inlet and an 8 foot fill on the outlet. At the time the culvert on Cache Creek was removed, Forest Service Staff used straw mulch and grass seed to stabilize the crossings and exposed soils (as depicted in the 1998 photo). A year later in 1999, it is apparent that some of the seed took but the exposed soils beyond the crossing were still fairly bare. The final photo was taken six years after the initial culvert removal. It is apparent in the photo that the grass and shrubs are becoming reestablished and that the site is stable.

On the remainder of the road, similar results were noted. Though most of the crossings were well vegetated and stabilized, there were just a couple where not enough fill was originally pulled and the channel had to rework the loose material to reach equilibrium. Overall, the road treatment was a success in terms of creating a hydrologically neutral road prism.

Figure 37. Cache Creek Road

1998	1999
	

Field Review in July 2004



Lakeface Lamb: Stewardship Coordination and Monitoring

The Lakeface Lamb Stewardship project continues to be an excellent example of collaboration among a diverse group of individuals. The primary objective of this particular effort was to reduce fuel loading within the urban interface. In addition to treating fuels, the Priest River Development Corporation (PRDC) who manages the project, also improved roads and treated weeds. The efforts of the PRDC and Forest Service were tracked by a citizens monitoring group.

Working in tandem with both the PRDC and the citizen's monitoring group has allowed the USFS to learn and share with different interest groups. The water quality monitoring group in tandem with the district hydrologist have monitored the ongoing work and noted both successes and needs for improvements. Those areas where concerns are noted, the sale administrator has worked with the PRDC to improve conditions. For example, during one review with the citizen's monitoring group, it was noted that a jump up road used for logging that was fairly steep was rilling slightly and delivering sediment to a stream. This concern was quickly remedied and the contractors put slash across the slope which successfully arrested any future erosion.

Figure 38. Jump Road

Before	After
	

In another instance, the original contract called for placement of a culvert to get equipment across a live ditch. The original culvert placement did not have sufficient Best Management Practices in place at the critical time and thus some sediment did move down the ditchline and into the lake (Photo below from November). Once the error was brought to the attention of the contractors, every effort was made to stabilize the site and reduce any additional sediment delivery. In an unusual move, the problematic culvert was removed in January, when the ground was frozen. The reason the culvert had to be pulled was that it was far undersized and would have been unable to convey the spring runoff. The photo below from January 2005 shows the final culvert removal.

Figure 39. Culvert Crossing

Culvert installed in Nov. 2004	Culvert removed in January 2005
	

The lessons learned from this particular culvert installation and removal are the following: The culvert was undersized to begin with and therefore should never have been installed. A second lesson was that in specific instances such as installing a culvert in a ditch with live water, very defined best management practices should be discussed and clearly understood by everyone involved. The final lesson from this specific project was that if at all possible, culvert removals should be avoided when the ground is frozen. While sediment delivery was minimized, it was quite challenging to recontour the slopes adjacent to the crossing. The final product at this site was a mulched and stable ditch line.

Granite/Kalispell Creek Temperature Summary: 2002-2004

The intent of this report is to demonstrate the type of analysis that is possible through interpretation of temperature data derived from stream temperature data loggers. The North Zone of the IPNF has been utilizing temperature data loggers to record hourly temperature variations in selected streams since 2000. We have expanded our program to include a variety of stream types and geographical locations. On the Priest Lake District alone, 18 sites are currently being monitored for temperature. From the data we collect we are able to make reference comparisons between similar watersheds, interpret temperature fluctuations over time, and ascertain management implications on watershed temperature responses. For ease of presentation, we are presenting the temperature data from two of the eighteen sites. The following is a cursory interpretation of three years of temperature data from the Granite Creek and Kalispell Creek watersheds on the Priest Lake Ranger District.

The Priest Lake Ranger District began collecting data in Granite and Kalispell Creeks in 2002 to develop a baseline of temperature data to monitor watershed health and possible effects from management activities. Due to the foundational role that water temperature plays in the function of aquatic ecosystems and because many human activities impact temperature, water temperature criteria have been adopted into the Idaho Department of Health and Welfare Rules, Title 01, Chapter 02, "Water Quality Standards and Wastewater Treatment Requirements," also known as IDAPA 16.01.02 (Idaho Department of Health and Welfare 1999) (Idaho DEQ, 1999). Temperature is a critical variable for native fish species. To determine the range of variability and limiting factors with regards to water temperature, data loggers are placed in the stream according to protocols established by the Idaho Department of Environmental Quality in "Water Quality Monitoring Protocols – Report No. 10". Data loggers are launched in the spring and remain in the stream, collecting temperature information in one-hour intervals, until October or November. We then retrieve the data loggers and download the information onto the computer where the data is organized so that we can effectively analyze it.

Data Summarization

Granite Creek

All data collected for the three-year period in Granite and Kalispell Creeks was collected from the beginning of June to the end of October with the exception of the 2002 data from Granite Creek, which begins on the 23rd of June. Stream temperatures are about 8.5 degrees Celsius in Granite Creek on the date of deployment, with the exception of 2002 data. Stream temperatures exceed the 10 degrees C standard for bull trout during the last week in June in all three years. Stream temperatures rise incrementally, with the exception of periodic decreases in temperature that may be associated with higher stream discharge or decreases in ambient air temperature, to maximum temperatures of about 16 degrees C in late July. Again, 2002 data is the exception where maximum temperatures of 14.45 degrees C were attained by June 15th. Stream temperatures remained above the 10 degree C bull trout standard until September 11th when stream temperatures in 2003 and 2004 dropped below. In 2002 stream temperatures fell below 10 degrees C on September 7th but rose above again on the 10th to fall below again on the 16th. Stream temperatures steadily dropped to a few degrees above 0C by the date the data loggers were pulled in October.

Kalispell Creek

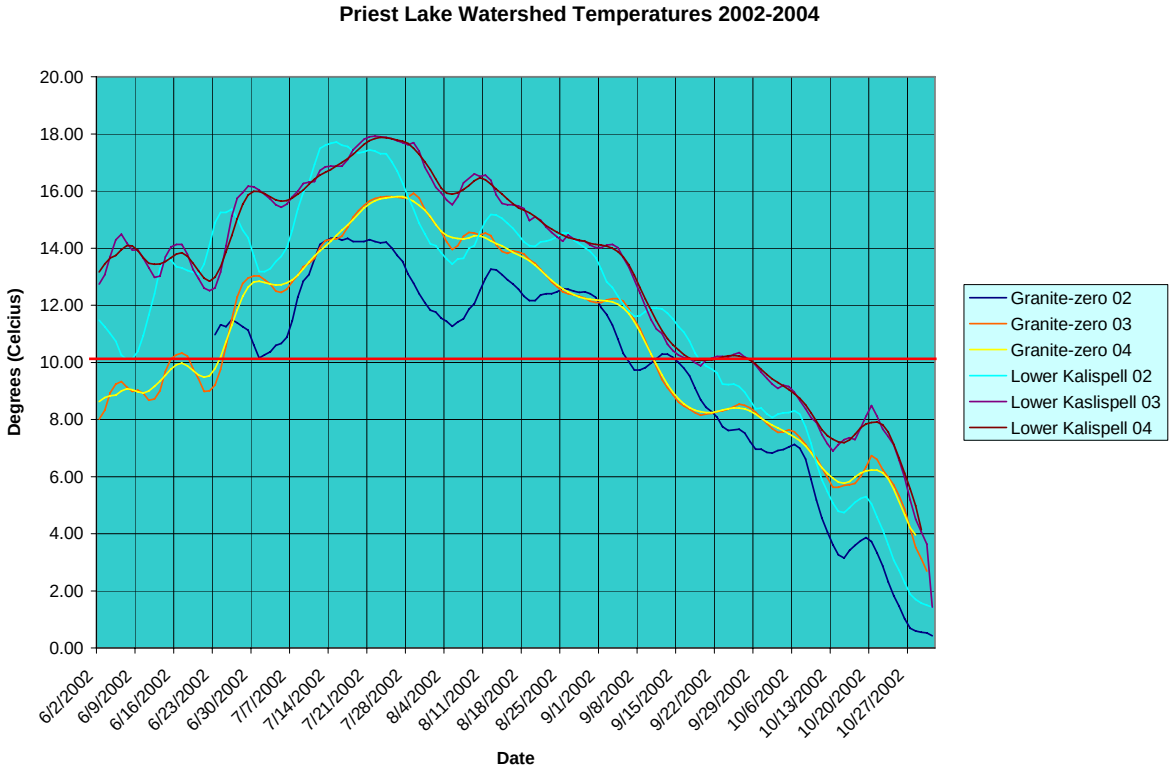
Stream temperatures are about 13 degrees C in Lower Kalispell Creek on June 2nd, the date of deployment. Again, the exception is the 2002 data, which consequently shows good correlation with the 2002 Granite Creek data. It must be noted that the 10 degree C bull trout standard is exceeded on the date

of deployment. Maximum temperatures of about 18 degrees C are attained on June 22nd in 2003 and 2004. Year 2002 maximum temperatures of 17.84 degrees C are attained on June 15th. Stream temperatures are in 100% exceedence of bull trout standards from the date of deployment until, simultaneously, the temperatures drop below 10 degrees C for all three years of record. Stream temperatures steadily dropped to a few degrees above 0 degrees C by the date the data loggers were pulled in October.

Conclusions

Exceedence values for various criteria, i.e. salmonid spawning, coldwater biota, fry rearing, are easily obtained through interpretation of temperature data. Higher levels of data interpretation are possible through comparing a watershed with no resource management to a managed watershed with similar characteristics. Other comparisons are possible depending on the monitoring objectives. It must be stated that is important to obtain a thorough period of record on numerous unmanaged watersheds to have a baseline of data that reflects natural ranges of variability and natural limiting factors that the forest will have as a means of controlled comparison of baseline data. In this manner, forest managers will be able to make relevant ground-based management decisions by interpreting temperature data for priority and managed watersheds.

Figure 40.



[1]

[1] The Kalispell Data was from the site located just below the Kalispell Bay Road Crossing, about ¼ mile upstream of the confluence of Kalispell Creek and Priest Lake. The Granite Creek data is from a site located in the mainstem of Granite Creek at its confluence with Zero Creek.