Idaho Panhandle National Forests

FOREST PLAN

MONITORING AND EVALUATION REPORT

2003

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I. INTRODUCTION

The monitoring and evaluation process compares the end results that have been achieved to the projections made in the Forest Plan. Costs, outputs, and environmental effects, both experienced and projected, are considered. This process comprises a management control system, which provides information to the decision maker and the public on the progress of implementing the Forest Plan. Monitoring is designed to gather data necessary for the evaluation. During evaluation, date provided through the monitoring effort are analyzed, interpreted, and then used to determine if the implementation of the Forest Plan is within the bounds of the plan. Annual reports have been prepared from fiscal year 1988 through fiscal year 2002.

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 1998 and are again included in this year's report. These are:

A-1 Outputs of Goods and Services
A-2 Effects on and of National Forest Management
B-1 Harvested Land Restocked within Five Years
B-2 Timberland Suitability
B-3 Validate Maximum Size Limits for Harvest Areas
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This report also includes information on a number of topics not required by the Forest Plan but important to forest management. These subjects are: sensitive wildlife species, ecosystem restoration, old growth, whitebark pine, and fire/human disturbance.

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 2003, 42.2 MMBF was offered, 22.1 MMBF was sold, and 53 MMBF was harvested. The number of acres sold for harvest was 3,282. Payments to counties in fiscal year 2003 totaled $8,146,162.00.

- The woodland caribou population trend has been stable for the last year. Forty-one woodland caribou were counted in the 2003 winter aerial survey. Grizzly bear habitat was little changed for fiscal year 2003, with six 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 2003. Sales pending completion will be reviewed upon their completion in following reports. With the majority of harvest employing partial cut methods in fiscal year 2003, the percentage of clearcut acres (about 2 percent of harvested acres between fiscal years 1999 and 2003) continues to decline.

- 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 2003 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.

- In conjunction with Idaho Department of Fish and Game, we conducted annual survey of a subset of streams on the IPNF. The primary focus of these surveys has been westslope cutthroat trout and bull trout. Based on current information, bull trout and westslope cutthroat trout populations appear to be stable throughout most of north Idaho. Redd count data in the Pend Oreille basin show that bull trout populations are stable and may be increasing, while populations in the Priest basin appear to be declining overall but increased in 2003, and populations in the St. Joe basin appear mixed.

- We are continuing to look for opportunities to use funds from a variety of sources to restore ecosystems. Examples of Forest ecosystem restoration work for fiscal year 2003 are listed below. See the Ecosystem Restoration section of this report for more details.
    - Planting approximately 341,163 rust resistant white pine seedlings.

- Planting approximately 2,659 acres of white pine, larch and ponderosa pine. These are species that are in short supply on the IPNF.
- Reducing forest density by thinning 3,374 acres, most of this released larch, white pine and ponderosa pine.
- Pruning 3,682 acres of white pine saplings. This reduces mortality from white pine blister rust.
- Integrated weed treatments were accomplished on 5,027 acres.
- There were 2,613 acres of harvest related natural fuel reduction and 6,375 acres of natural fuel reduction.
- Improving 150 acres of soil and water resources.
- Decommissioning 47.2 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 275,200 acres (11.9 percent of our forested acres) to be retained as old growth. We have an additional 7,442 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 FY 2003.

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

III. MONITORING ITEMS

This section contains the monitoring and evaluation results for fiscal year 2003 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	$39,932,300
Total number of employees	486 (permanent and temporary)
Volume of timber offered	42.2 million board feet
Volume of timber sold	22.1 million board feet
Volume of timber harvested	53 million board feet
Total acres of timber sold	3,282 acres
Payments to counties	$8,146,162.00
Total reforestation completed*	2,775 acres
Total number of seedlings planted	967,329
Timber stand improvement completed	4,003 acres
Pruning of white pine	3,682 acres
Soil and water improvement completed	676 acres
Roads maintained	1,800 miles
Roads constructed	4.3 miles
Roads reconstructed	64.5 miles
Roads decommissioned	47.2 miles
Trails constructed/reconstructed	20 miles
Trails maintained to standard	425 miles
Number of wildfires	129 fires
Acres burned by wildfire	3,972 acres
Harvest related fuel treatment	2,613 acres
Hazardous fuels reduction	6,375 acres
Wildlife habitat restored	1,705 acres
Wildlife habitat inventoried	5,579 acres
TES terrestrial habitat inventoried	1,346 acres
Noxious weeds treated	5,027 acres
Abandoned/inactive mines	6 sites addressed

*Includes both planted and natural regeneration that was established in 2003.

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

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 past 10 years. There are seven counties in Idaho, two in Montana, and one in Washington that receive payments from IPNF activities. The base for the 25 percent payment to states by the IPNF for fiscal year 2000 was collection of $15,248,318.73. Timber volume harvested in FY 2000 was 90 million board feet, increased from 58 million board feet in 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 counties 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 and 6, below, show the same information for fiscal years 2002 and 2003.

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**

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 7. 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

Figure 1. Total Number of Employees

Evaluation: Table 7 and Figure 1 show the way our workforce has changed from 1991 to 2003. We went from a high of 762 permanent and temporary employees in fiscal year 1992, to 486 at the end of fiscal year 2003. 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-1: Harvested Lands Restocked in Five Years

The National Forest Management Act specifies that lands where timber harvest occurs should be adequately restocked with trees within five years after final harvest. The Idaho Panhandle National Forests has a Forest Plan standard of 90 percent of harvested lands adequately stocked within five years following final regeneration harvest.

The Timber Stand Data Base is used to give the percentage of stands in each regeneration status category. There are three possible regeneration status categories in the database: failed, progressing, and certified. Failed means that the stand is not expected to meet stocking standards for certification within five years without major future treatment. Progressing means that the stand is on a trajectory that meets stocking standards, but that the crop trees are not yet old enough, large enough, or growing rapidly enough that the stand can be removed from regeneration status. Progressing stands are not expected to need any further major treatment to become certified within five years. Certified stands fully meet the stocking standards, and the trees are large enough, old enough, and growing rapidly enough that the stand can be considered fully established and removed from regeneration status. To be considered either progressing or certified, a stand must be adequately stocked according to the stocking objectives for that site.

Over the past sixteen years of monitoring (Table 8), our reforestation success rate has averaged 88 percent. Of the stands that had a final regeneration harvest in 1998 averaged 58 percent adequately restocked. This is a lower percentage than normal and is due to recent drought problems and time delays for site preparation activities that occurred on one district. Most of these units will be planted in fiscal year 2004.

Table 8. Forest Average For Stands Satisfactorily Stocked Within Five Years

Year	Average Stocked Within 5 Years
1983	86%
1984	90%
1985	94%
1986	95%
1987	96%
1988	96%
1989	92%
1990	86%
1991	78%
1992	78%
1993	81%
1994	98%
1995	99%
1996	96%
1997	84%
1998	58%

In 2003, over 967,000 seedlings were planted on 2,674 acres.

Forest Plan Monitoring Item B-2: Timberland Suitability

The plan called for the forest to gather data on timberland suitability by monitoring project-level development. Changes in timberland suitability (suitable land that was actually unsuitable, or unsuitable land that was actually suitable) were to be noted and recorded on an overlay map and a separate data file. The threshold was a 10 percent change in the 1,584,163 acres of timberland currently classed as physically suitable for timber production (a 158,416 acre change).

Suitable Forest Land was defined as land for which technology is available that will ensure timber production without irreversible resource damage to soils, productivity, or watershed conditions; for which there is reasonable assurance that such lands can be adequately restocked and for which there is management direction that indicates that timber production is an appropriate use of that area.

Unsuitable timber land was not selected for timber production in step II and III of the suitability analysis during the development of the Forest Plan due to (1) the multiple-use objectives for the alternative preclude timber production, (2) other management objectives for the alternative limit timber production activities to the point where management requirements set forth in 36 CFR 219.27 cannot be met and (3) the lands are not cost-efficient over the planning horizon in meeting forest objectives that include timber production. Land not appropriate for timber production shall be designated as unsuitable in the Forest Plan.

The only data received for the 2003 report was from the Bonners Ferry Ranger District

Table 9. Suitability Changes Recommended by Project Summary, 1999-2003

	Acres	Project Name
From suitable to unsuitable	0	
From unsuitable to suitable	463	Myrtle-Cascade and Dry Wall

Forest Plan Monitoring Item B-3: Validate Maximum Size Limits for Harvest Areas

The Forest Plan stated that openings created by even-aged silviculture were to be generally limited to 40 acres. Projects that would create larger openings were to conform to Regional guidelines regarding public notification, environmental analysis and approval.

The monitoring plan set a threshold when 10 percent of openings exceeded the 40 acre standard over a five year reporting period. The measurement was to be by regeneration acre sold or harvested. A regeneration acre is the removal of timber by clearcut, shelterwood, or seed tree harvest and renewal of a tree crop.

Table 10. Acres and Number of Units Over 40 Acres Using Regeneration Harvest

Year	Regeneration Acres Harvested	Acres in openings greater than 40	Percent of Total	Number of Units Harvested	Number of Units greater than 40 acres	Percent of Total
1999	2,786	992	35.6	157	11	7.0
2000	2,703	981	36.3	136	15	11.0
2001	1,448	407	28.1	96	5	5.2
2002	905	259	28.6	54	4	7.4
2003	1,229	507	41.3	48	8	16.7

Table 11. Acres and Number of Units Over 40 Acres Harvested By Clearcuts (Including Clearcuts with Reserves)

Year	Acres Harvested By Clearcut	Acres in Openings greater than 40	Percent of Total	Number of Clearcut Units Harvested	Number of Units greater than 40 acres	Percent of Total
1999	423	88	20.8	29	2	6.9
2000	220	57	25.9	9	1	11.1
2001	60	0	0.0	5	0	0.0
2002	25	0	0.0	3	0	0.0
2003	75	0	0.0	6	0	0.0

Of the regeneration acres harvested from 1999 to 2003, 35 percent were greater than 40 acres in size. Of the number of units harvested, nine percent were greater than 40 acres.

Of the acres harvested using clearcuts 18 percent were greater than 40 acres in size. Only six percent of the clearcut units were greater than 40 acres in size.

Forest Plan Monitoring Item B-4: Insect and Disease Hazard

Aerial surveys, ground surveys, timber stand inventories, and actual insect trapping are all utilized to determine the extent of current pest problems and to predict future insect and disease impacts. There are also a large number of activities, which while they principally involve collecting information on vegetation also provide observations on insect and disease occurrence.

The purpose of this monitoring item is to determine insect and disease impact as modeled in the Forest Plan. The threshold is when insect and disease conditions are predicted to reach epidemic or serious levels on five percent of the Forest.

The following discussion includes a short summary of information for 2003. This is followed by a discussion of trends since 1988.

2003

Root disease and blister rust are the dominant diseases affecting the Idaho Panhandle National Forests. The acreages associated with these diseases did not change dramatically from year to year. About two million acres of north Idaho are infected with some level of root disease. Blister rust is found throughout the range of white pine.

While areas with disease do not change dramatically from year to year, that is not the case with insect activity, which can change rapidly. Most of the acres infested with insects in 2003 were picked up by aerial surveys. The estimated number of acres infested with Douglas-fir beetle in 1998, 1999 and 2000 on the Idaho Panhandle National Forests was 100,000 or more acres each year. However, the Douglas-fir beetle infestation in 2003 was 7,200 acres. In 2002 and 2003 there have been dramatic increases in fir engraver beetle damage with 49,600 acres infested in 2003. This very high level is expected to continue until drought conditions end. Mountain pine beetle damage was found on 66,700 acres. This level is similar to 2002. Western balsam bark beetle was found on 58,600 acres in 2003. This number doubled from 2002. All totaled, based on aerial detection, more than 277,480 trees were killed on approximately 182,000 bark beetle infested acres in 2003.

1988 - 2003

What associated with insects and disease has changed since the Forest Plan was adopted in 1987?

- Forest Health continues to be a major issue in northern Idaho: both in terms of insect and disease losses and forest fire risk resulting from tree mortality.
- Douglas-fir beetle is no longer epidemic on the IPNF, however, levels have not returned to those previous of the outbreak. Mountain pine beetle continues to threaten lodgepole pine, western white pine and whitebark pine. While white pine blister rust continues to cause mortality in white pine, concerns for the remaining whitebark pine have risen as it is also being impacted by mountain pine beetle. Fir engraver has been more evident in recent years related to droughty conditions.
- Treatments needed to reduce insect and disease hazards have been greatly reduced (specifically regeneration of tree species less-susceptible to insect and disease).

What do we know now that we did not know in 1987?

- The major change in forest composition and structure that has occurred in the past century has been documented and better quantified.

- The amount of Idaho Panhandle National Forests forest area that is susceptible to insects and pathogens increased significantly during recent decades, and much of the area is now at risk of root diseases or bark beetle attack.
- Interior Columbia Basin Ecosystem Management Project modeling and Forest Health Assessments have shown that insect and disease drive succession in the absence of fire or management, and the result is further departure from historic forest conditions.

Recommendations

- Treat Forest Health as an issue in the up-coming Forest Plan revision, and make improvement in forest structure and composition a purpose and need for action.
- In the Forest Plan revision, calibrate and use successional models to predict future vegetative conditions under different management scenarios to determine how much management and what activities are needed to reverse the decline of forest conditions and achieve a specified level of improvement.
- Use Geographic Assessment (basin scale) information to identify locations where treatment is needed to reduce insect and disease susceptibility and improve forest conditions while also improving watershed conditions and wildlife habitat along with decreasing wildfire risk.
- Continue development of new thresholds for insect and disease that involve monitoring treated and non-treated lands for change in hazard and risk.
- Use multi-resource inventory, supplemented as needed, to monitor changes in root disease and bark beetle hazard and risk and evaluate the performance of blister rust resistant western white pine.
- Look for opportunities to do restoration treatment in whitebark pine in order to reverse its precipitous decline (which results from the combination of blister rust, mountain pine beetle, and fire suppression).

Forest Plan Monitoring Item B-5: Road Construction

The Forest Plan projected that 176 miles of new roads would be constructed each year and 97 miles would be reconstructed. The following table summarizes the number of miles of road construction and reconstruction that actually occurred from 1987 through 2003.

Table 12. Miles of Road Construction and Reconstruction, 1988 - 2003

Fiscal Year	Miles of Construction	Miles of Reconstruction
1988	103	233
1989	134	130
1990	83	140
1991	46	107
1992	65	109
1993	57	233
1994	2	43
1995	12	54
1996	1	41
1997	16	202
1998	12	276
1999	5	74
2000	2	373
2001	3	<1
2002	1	24
2003	4	64
Totals	**546**	**2,104**

This table shows that the projected amount of annual new road construction (176 miles) was much greater than the amount that actually occurred for every year from 1988 to 2003. For road reconstruction the amount projected (97 miles) was exceeded for 9 of the 16 years. Road reconstruction generally occurs on older roads and is necessary to bring them up to standards so they are drivable.

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 2003: For this fiscal year the Idaho Panhandle National Forests offered 42.2 million board feet of timber for sale. We sold 22.1 million board feet.

Fiscal Year 1991-2003: Table 13 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 13. 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

Figure 2. Timber Volume Offered and Sold

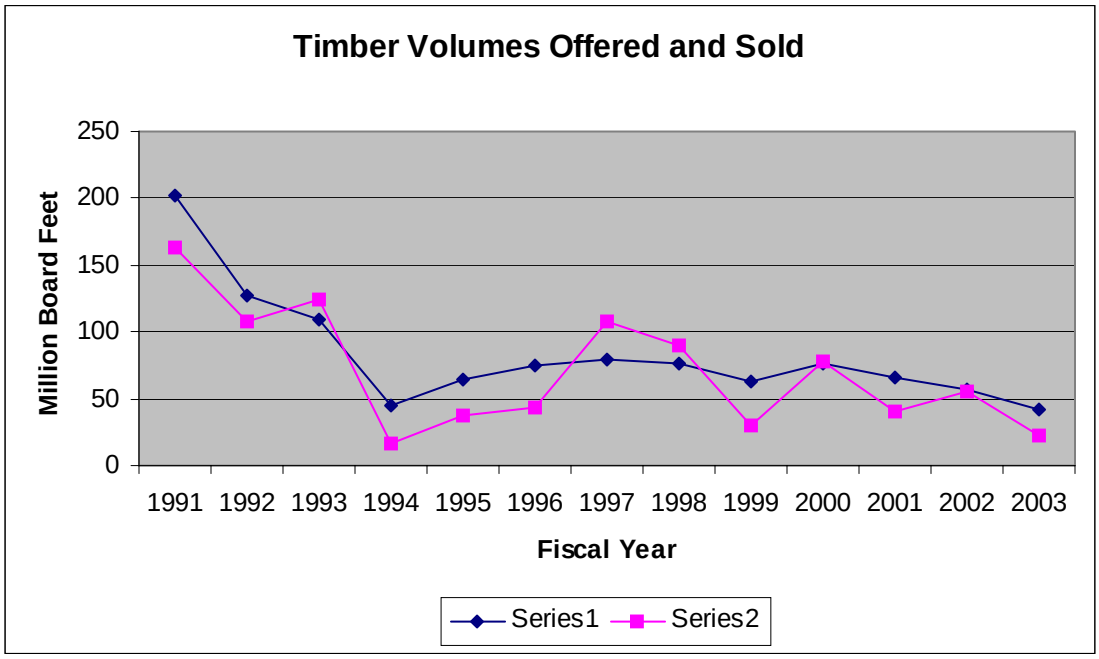
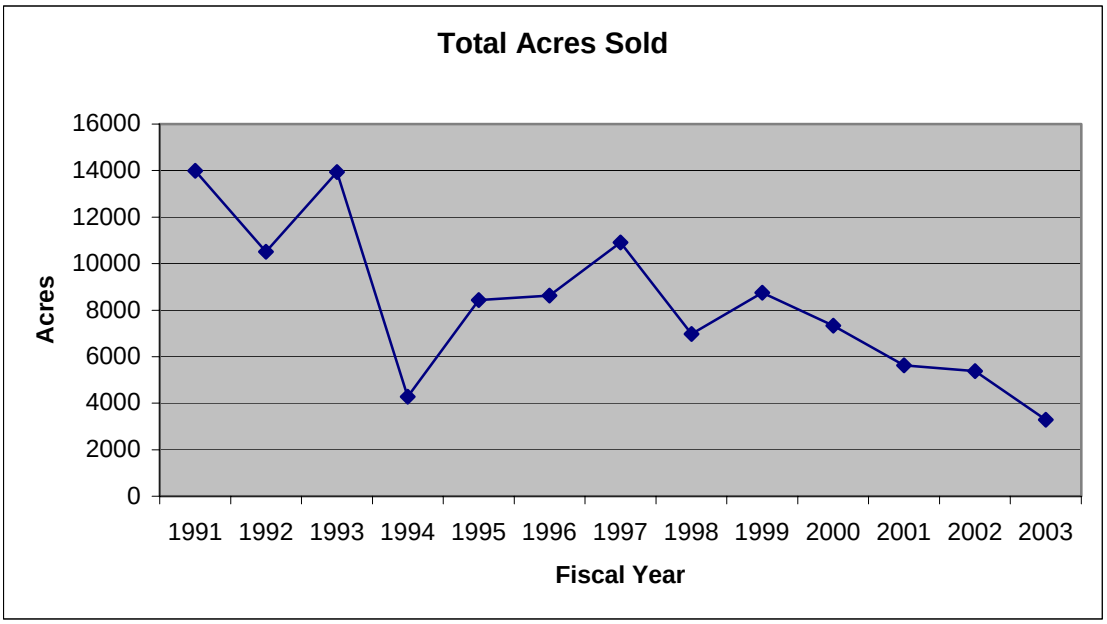


Figure 3. Total Acres Sold



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 2003 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 2003

Item C-1 requires annual assessment of our effectiveness managing the Idaho Panhandle National Forests' scenic resource to meet or exceed established Forest Plan Visual Quality Objectives (VQO) commensurate with other resource requirements. The Idaho Panhandle National Forests' Visual Quality Objectives are based on *The Visual Management System,* Forest Service Agriculture Handbook Number 462. Visual resource management is an integral activity in each management area and is implied in all management goals. The adopted Forest Plan VQOs are based on seen areas from viewpoints that have a variety of importance to the public. A list and map of the assigned sensitivity levels is contained in Appendix D of the Forest Plan. Scenery management is enhanced through public interest. The system gives special emphasis on maintaining the uniqueness of the visual resources and especially those areas that surround the major lakes. The following is a summary of FY 2003 planning and harvest activities. Detailed reports are available from the District Offices, upon request.

Forest Plan compliance with Visual Resource management allows 10 percent deviation from meeting VQOs over five year periods. The report addresses this requirement with a summary for the five-year period from 1999 to 2003. See *Meeting Threshold* table.

Table 14. *PLANNING for Meeting Visual Quality Objectives*

The following fourteen timber sales were advertised and/or sold in fiscal year 2003. All fourteen were designed to meet assigned Forest Plan VQOs. Analysis reports were completed on each of them.

NORTH ZONE - PRIEST LAKE RANGER DISTRICT	
Timber Sale Name	**Was the sale planned to meet Forest Plan VQOs?**
No planned sales in fiscal year 2003	
NORTH ZONE – BONNERS FERRY RANGER DISTRICT	
Blazing Saddle	Yes
Dry Wall	Yes
US Hwy 95 Settlement	Yes, Scenic integrity should remain high with all elements intact except for the integrity levels within the roadway corridor. The road is being relocated higher up on the hill and being straightened out, which will improve and extend safe viewing periods of the Selkirk Mountains and Kootenai River valley to the west especially. Windshield views from the road will be enhanced with scenic turnouts for motorists.
NORTH ZONE – SANDPOINT RANGER DISTRICT	

Timber Sale Name	Was the sale planned to meet Forest Plan VQOs?
West Gold Sale (not sold)	Yes--with several attempts to rehabilitate the view of old square clear cuts. The following photo illustrates the existing condition of an area needing visual rehab. Only the bottom and sides of the clear cuts were available for treatment under the West Gold Environmental Impact Statement. It is anticipated that it will require more than one entry to improve the appearance of the clear cuts significantly. This will be considered a "work in progress". 
CENTRAL ZONE – FERNAN RANGER DISTRICT	
Dead Grassy	Yes
Fernan Hill	Yes

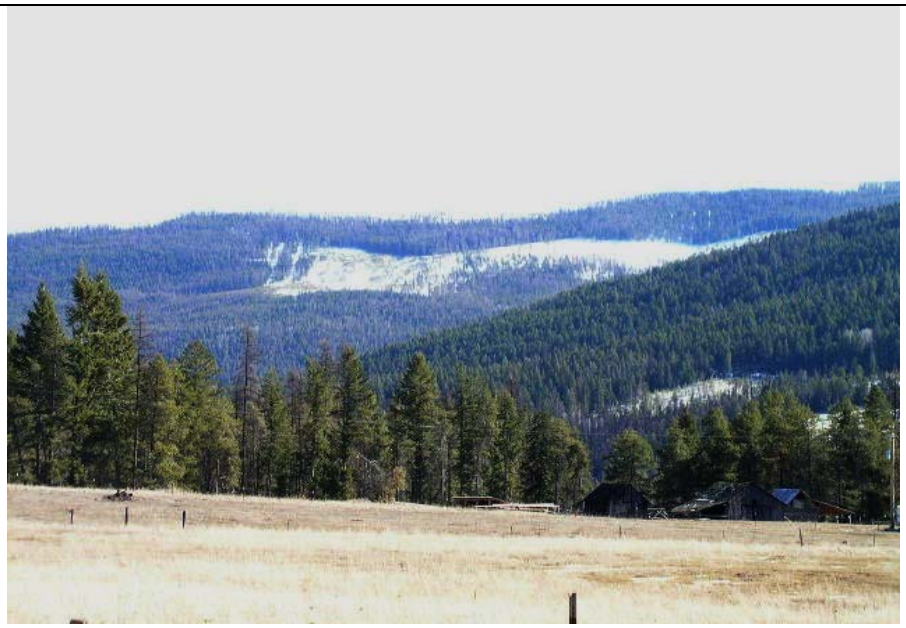
CENTRAL ZONE – WALLACE RANGER DISTRICT	
Timber Sale Name	**Was the sale planned to meet Forest Plan VQOs?**
Yon Ferguson	Yes
Small Missouri Heli	Yes
Regis T. Runt	Ski area runs. Complete and meets VQO.
Red-Eyed Grizzly	Yes
SOUTH ZONE - AVERY RANGER DISTRICT	
Mossy Cliff	Yes
Quarling Eagles	Yes
Turn Away	Yes
SOUTH ZONE – ST. MARIES RANGER DISTRICT	
Donkey Kong	Yes

Table 15. ***RESULTS MONITORING of Timber Sales Closed/Completed in Fiscal Year 2003***

In fiscal year 2003, ten projects were closed. The following chart provides a summary of results obtained from planning and implementing effective harvest methods to meet VQOs for these ten projects. The chart also gives the status of fiscal year 2001 and 2002 projects after completion of underburning. NOTE: These projects are indicated with an asterisk and are counted in the year they were first reported "Closed" on the *Meeting Threshold* table.

NORTH ZONE - PRIEST LAKE RANGER DISTRICT		
Timber Sale Name	**VQOs Met**	**Remarks - including harvest method**
Solo Grouse - Closed 11/1/2002	Yes	Modification / Maximum Modification VQOs met or exceeded. Tractor and skyline logging methods used.

Timber Sale Name	VQOs Met	Remarks - including harvest method
Tola Closed 10/1/02	Yes	Modification / Maximum Modification VQOs met or exceeded. Tractor, skyline and helicopter harvest methods used.
Dusty Peak Closed 3/1/03	Yes	Modification / Maximum Modification / Partial Retention VQOs met or exceeded. Tractor/ skyline /helicopter harvest methods used.
NORTH ZONE – BONNERS FERRY RANGER DISTRICT		
Timber Sale Name	**VQOs Met**	**Remarks - including harvest method**
Lower Italian Closed 7/1/03	Yes	This sale included mostly improvement cut treatments, with 15 units totalling 529 acres. Logging systems included soft-track, tractor and skyline yarding systems and all units were restricted to winter season operations. Approximately 2/3 of the sale is in Modification /Maximum Modification VQO and the remaining 1/3 is in Partial Retention VQO.
Hellroaring Closed 7/1/03	Yes	This sale included mostly sanitation salvage and commercial thinning treatments, with 21 units totalling 911 acres. Logging systems were tractor, soft-track or skyline yarding and all but a few units were restricted to winter season operations. An attempt was made to visually "rehab" several existing clearcuts (units 132, 136, and 137), by trying to harvest around the edges of the units to remove the hard-edge appearance due to the dense tree stocking of the surrounding timber stands. A combination of sanitation salvage and irregular shelterwood treatments were applied adjacent to the existing clearcuts. While the sale met the VQO of PR, the attempt to restore the visual character was not completely successful. This was due to being too timid in removing trees around the edges, in combination with skyline yarding, which, as the photo shows, only resulted in showing the corridors used during the harvest. Note that this photo was taken on March 10, 2004, when snow was still on the ground. Winter conditions normally give the viewer the "worst case scenario" for revealing harvest activities. When the snow is off the ground, corridors are usually harder to detect by the casual forest observer.

		
Kat Tail II Closed 6/1/03	Yes	Commercial thin/group selection roundwood sale on 90 acres. Cut-to-length harvesting and forwarding in the winter. VQO of Partial Retention easily met. Can't be seen from any main roads, best viewed while standing in unit. This treatment meets definition of "enhancement". **Portion of stand before treatment. Note harvester in trees.** 

		Same area after treatment. Enhanced view of largest trees retained in stand that weren't easily visible before treatment. 
Old Koot Closed 3/1/03	Yes	Commercial thin/salvage/group selection sale, including roundwood. Sale had eight units totalling 238 acres and used tractor and helicopter yarding in combination with feller bunchers. Most of this sale took place during the winter season. VQO of Partial Retention was met and actually achieved visual enhancement alongside the Katka road, an area heavily traveled by local recreationists. Stands look similar to Kat Tail II.
McFee Line Closed 2/1/03	Yes	Irregular seed tree and commercial thin/salvage, including roundwood removal. Sale included three units totalling 151 acres and utilized feller buncher and tractor yarding. VQO of PR was easily met and residual stands look similar to Kat Tail II and Old Koot.
NORTH ZONE – SANDPOINT RANGER DISTRICT		
Timber Sale Name	**VQOs Met**	**Remarks - including harvest method**
Packsaddle South 9/1/03	Yes at approx. the 90 % level	Packsaddle South sale is a large sale with 17 cutting units. Several of the units are "landscape" type units of up to 230 acres. Monitoring indicates that we are much more successful at meeting VQOs when treating a large (landscape) area instead of smaller "units". Unit boundaries can follow natural terrain features instead of cutting across a uniform side slope, treatments can borrow from more features in a larger landscape, and changes in form, line, color, and texture can be molded in to natural places for change like ridge tops and valley bottoms instead of the middle of the slope. The following photo includes skyline and helicopter units #'s 3, 4, 5, 6, 7, 11, 12, and 13. These units treat all or most of each of three entire ridges and borrow from a very large natural opening in the background. The photo is taken from one of the few open vistas of Lake Pend Oreille along the main Bunco (332) road.

		 The road on the right side of the photo was constructed in the early 80's and was not part of this sale.
White French Closed 9/26/03	Yes	White French was a small sale consisting of thinning second growth timber. The area can not be seen from any sensitivity level one viewpoints. Short glimpses of the sale area can be seen from the Pack River road in the middle ground and that is where the VQO of modification is derived. The vertical view angle is somewhat obliqe and combined with the thinning prescription none of the sale activities can be discerned. The sale exceeds all assigned VQOs.

CENTRAL ZONE – WALLACE & FERNAN RANGER DSTRICTS		
Timber Sale Name	**VQOs Met**	**Remarks - including harvest method**
Windy Buttes Beetle Closed 9/27/02	Yes	First reported "Closed" fiscal year 2002. Burning completed fiscal year 2003. VQOs met.
Cherry Heli Bug Closed 9/27/02	Yes	First reported "Closed" fiscal year 2002. Burning completed fiscal year 2003. VQOs met.
Beaver Heli Bug Closed 3/1/02	Yes	First reported "Closed" fiscal year 2002. Burning completed fiscal year 2003. VQOs met.
Yellow Horse Beetle Closed 9/27/02	Completion pending	Reported "Closed" fiscal year 2002. Burning on 13 acres remains. Field review will be scheduled.
Search 4 Horizon Closed 9/27/02	Yes	First reported "Closed" fiscal year 2002. Burning completed fiscal year 2003. VQOs met.
Fernan Beetle Heli Closed 9/27/02	Yes	First reported "Closed" fiscal year 2002. Burning completed fiscal year 2003. VQOs met.
Rookie Hart Closed 5/1/02	Completion pending	Reported "Closed" fiscal year 2002. Seed tree removal on approximately 52 total acres. Burning remains. Field review will be scheduled once complete.
Yellow Dog Downey Closed 2001	Completion pending	Reported "Closed" fiscal year 2001. Burning remains. Field review will be scheduled upon completion.

Spion Kop	Yes	First reported "Closed" fiscal year 2001. Burning completed fiscal year 2003. VQOs met.
Barney Rubble Cabin	Completion pending	First reported "Closed" fiscal year 2001. Burning remains on 59 acres. Field review will be scheduled upon completion.
SOUTH ZONE – AVERY & ST. JOE RANGER DISTRICTS		
Timber Sale Name	**VQOs Met**	**Remarks - including harvest method**
No closed sales fiscal year 2003		

Table 16. ***MEETING THRESHOLD from 1999 through 2003***
A 10 percent departure from Forest Plan direction after five years initiates further evaluation.

Findings:
Visual analysis reports were prepared for planned projects. Assigned Forest Plan Visual Quality Objectives were met as follows during the 5-year period from 1999 to 2003. The Idaho Panhandle National Forests were well below the allowed 10 percent departure.

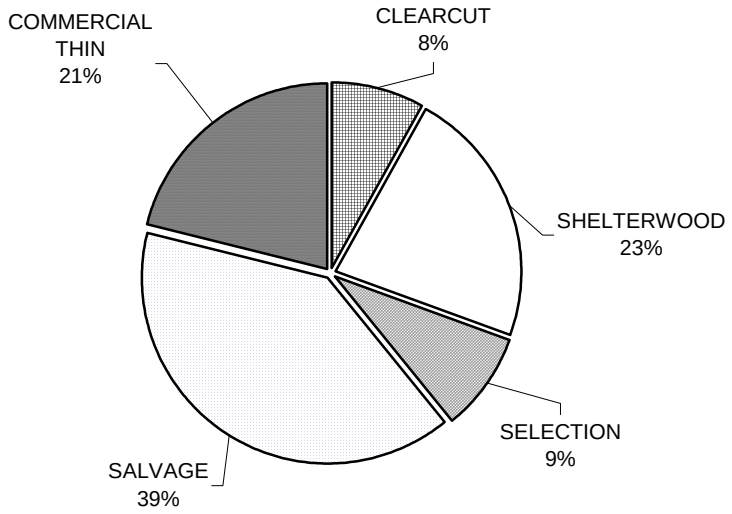
YEAR	NUMBER OF PROJECTS COMPLETED/CLOSED	NUMBER OF PROJECTS NOT MEETING VQO	DEPARTURE FROM DIRECTION
1999	38	1	0.03%
2000	33	0	0
2001	41 Yellow Dog Downey and Barney Rubble Cabin not included	<1 0	0.02% 0
2002	16 Rookie Hart and Yellow Horse Beetle not included	0	0
2003	10	<1	0.1%
AGGREGATE	138	<3	<0.2%

Summary: The Idaho Panhandle National Forests were well below the 10 percent allowable departure from Forest Plan direction in meeting Visual Quality Objectives. For the five years from fiscal year 1999 through fiscal year 2003 approximately 3% of total projects did not meet Forest Plan VQO's.

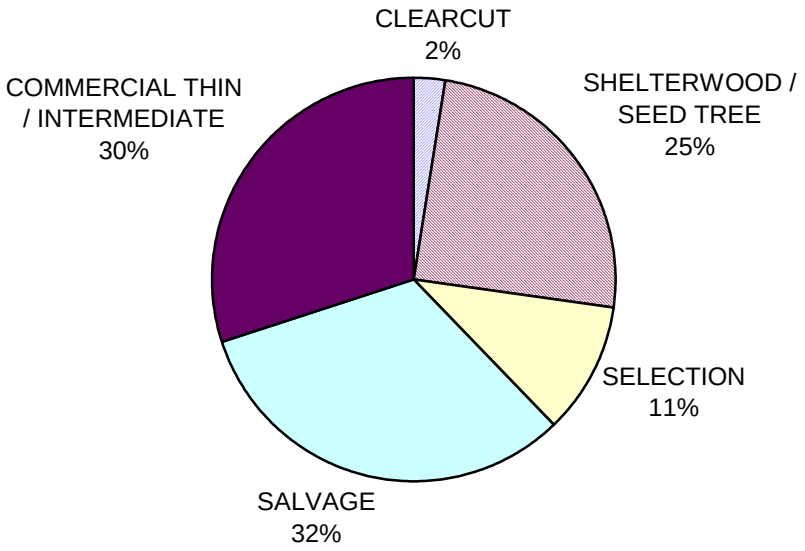
The public expects to have scenery in our National Forests meet their expectations. When it does, complaints are few. According to a 1993 survey, *Communications Workbook* (Copyright 1994 - compiled by A & A Research, Kalispell, MT, and summarized by Dr. E.B. Eiselein), 23 percent of all adult northern forest users interviewed stated "too much logging/ clearcutting" as the most important issue/concern/problem facing the national forests, second only to "logging and timber industry concerns" which was opined as the most important issue by 34.2 percent. 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, pp 18-20.)

Accounting of harvest activity on the IPNF, shows a trend toward the use of "lighter-on-the-land" methods. This approach, coupled with increased skills in project design and implementation, has resulted in more natural appearing landscapes. Use of clearcut harvest methods has declined drastically, with shelterwood, salvage, intermediate commercial thin, and selection harvest methods predominating. In 1994, 22 percent of total acre harvest was accomplished using clearcut methods. In 2003, clearcut methods were used on 0.55 percent of harvested acres. The charts, *1994-2003 Acres Harvested by Cutting Method* and *1999-2003 Acres Harvested by Cutting Method,* illustrates acres by cutting method over the last ten and five years, respectively.

1994-2003 Acres Harvested by Cutting Method



1999 - 2003 Acres Harvested by Cutting Method



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 2003.

Table 17. 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

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 2003, 445 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 15 projects. Thirteen of these projects required no field inventory work while two required field review of the proposals. The forest heritage resource staff determined that none of these projects would affect heritage resources.

Lands (Small Tracts Act Projects)

Two Small Tracts Act projects were reviewed and determined to have no effect on heritage resources.

Roads

Two of the three road projects reviewed were determined to have no effect on heritage resources. One proposed project was determined to have possible effects to heritage resources. One of the new bridges on U.S. Highway 95 near the Canadian border was carefully reviewed for possible effects to heritage resources. After consultation with the Idaho State Historic Preservation Office it was determined that the project would have no adverse effect and could proceed.

Range

One allotment on the St. Joe Ranger District was evaluated and determined to have no adverse effects to heritage resources.

Trails

One trail project on the Priest Lake Ranger District was reviewed and determined to have no effect on heritage resources.

Special Use Permits

There were 15 special use permit projects reviewed by forest heritage resource staff. All 15 were determined to have no adverse impacts to heritage resources.

Recreation

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

Minerals

One mineral testing project on the Coeur d'Alene River Ranger District was reviewed and determined to have no effect on heritage resources.

Facilities

The forest undertook three projects in 2003. All three were historic preservation projects involving Forest Service administrative facilities. The Luby Bay Garage project was completed in 2003, while the Avery Cabin and the Snyder Guard Station projects are part of ongoing efforts. The Region One Preservation Team completed the Luby Bay restoration project during the summer of 2003. They worked with district personnel and volunteers. Preservation Team member Dale Swee performed an assessment of Avery Cabin and continues to consult with district and forest personnel on work planned for 2004 and 2005. Bonners Ferry district personnel and local volunteers performed stabilization work on the pole barn at Snyder Guard Station. Consultation between Forest Heritage Resource Staff and the Idaho State Historic Preservation Office regarding the work at Snyder Guard Station is ongoing. Work on Snyder Guard Station will continue over the next several years.

Other Heritage Resource Accomplishments

The North Zone Archaeologist and paraprofessional have been monitoring rock art sites on the Forest's North Zone. Work continues on a National Register of Historic Places nomination, which may be submitted this coming year.

The Forest actively sponsored 2003 Idaho Archaeology Week activities in Bonner and Boundary counties. The North Zone Archaeologist presented six programs in Sandpoint, Bonners Ferry, and Priest Lake. During the fall he made presentations about area logging and mining history to groups at the Bonner County Historical Society and at the Inland Empire Section Meeting of the Society of American Foresters.

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.

Forest Plan Monitoring Item F-1: Population Trends of Indicator Species

This monitoring item has a five-year reporting period. In 1987, the Forest Plan for the Idaho Panhandle National Forests identified indicator species to help assess the impact of land management decisions on the wildlife resource. The ten indicator species are: bald eagle, grizzly bear, woodland caribou, gray wolf, elk, moose, white-tailed deer, goshawk, pine marten and pileated woodpecker. The peregrine falcon was listed after the Forest Plan was adopted.

Population Estimates: Estimating population numbers and trends can be extremely difficult. Most estimates involve cooperative surveys and information sharing with other agencies, such as the Idaho Department of Fish and Game, Washington Department of Fish and Wildlife, Forest Service and University researchers. Examples of the sources of information for population trends include ground surveys, aerial surveys, radio-collared animals, mortality and harvest reports, transplant activities, incidental sightings and law enforcement activities. Habitat information may be used where population data are lacking.

Population Surveys: Since 1998, the Forest Service has conducted surveys on the Idaho Panhandle National Forests for three management indicator species: bald eagle, goshawk and peregrine falcon.

The Idaho Department of Fish and Game and Washington Department of Fish and Wildlife conduct surveys of grizzly bear, woodland caribou, elk, moose and white-tailed deer. In the last five years, no surveys have been conducted for the remaining management indicator species, although incidental sightings of these species are recorded in Forest Service databases.

Idaho Department of Fish and Game has limited population data on elk in part of the Idaho Panhandle and data on bald eagle productivity. Neither the Forest Service or Idaho Department of Fish and Game has population data on the other management indicator species in the following table.

* *In the following table, the trends of these species are the professional opinion of Jim Hayden, regional wildlife biologist for Idaho Department of Fish and Game in Coeur d'Alene. These are trends for the region (for the Selkirks this includes British Columbia), not just national forest lands.*

** *Trend estimate for Selkirk grizzly bears is by Wayne Wakkinen, Idaho Department of Fish and Game grizzly bear research biologist, and Cabinet/Yaak grizzly bear trend estimate is by Wayne Kasworm, U.S. Fish and Wildlife Service grizzly bear research biologist.*

Table 18. Management Indicator Species Population Trends

Management Indicator Species	1998 population estimate	2003 population estimate	IPNF surveys 1998-2003	Trend
Bald eagle	3 bald eagle nests on Idaho Panhandle National Forests (34 nests monitored in region)	10 bald eagle nests on Idaho Panhandle National Forests (52 nests monitored in region)	1999 - 2 nests 2000 - 4 nests monitored; fledged 6 chicks 2001 - 4 nests monitored; fledged 4 chicks 2002 - 6 nests monitored; fledged 6 chicks. 2003 - 6 nests monitored; fledged 10 chicks.	Up*
Peregrine falcon	2	0 to 2	1999 - 0 chicks fledged 2000 - 2 chicks fledged 2001 - 4 chicks fledged 2002 - 0 chicks fledged 2003 - eyrie not active	No change*
Woodland caribou	45	41	2003 - 41 in winter aerial survey	No change*
Grizzly bear	Selkirk - 45 to 50 (U.S. + B.C.) Cabinet/Yaak - 30 to 40 (U.S. + B.C.) **	Selkirk - 35 - 40 (U.S. only) Cabinet/Yaak - 30 to 40 (U.S. + B.C.) **	Idaho Department of Fish and Game and U.S. Fish and Wildlife Service monitor grizzly bears.	Up slightly*
Canada lynx	Unknown	Unknown	2003 – South Zone data not analyzed	Unknown
Gray wolf	No packs	2 packs	None	Up*
Pine marten	Unknown	Unknown	None	Unknown
Elk	Unknown	Unknown	Unknown	Up*
Moose	Unknown	Unknown	Unknown	Up*
White-tailed deer	Unknown	Unknown	Unknown	No change*
Northern goshawk	51 territories known	66 territories known	2003 - 31 territories monitored	Unknown*
Pileated woodpecker	Unknown	Unknown	2003 – Central Zone found in 3 of 7 surveys	Unknown*

Canada Lynx: 2003 was the last year of a 3-year lynx survey on the St. Joe Ranger District. Twenty-five transects effectively surveyed a 6,400 acre (100 square mile) area using the national lynx hair detection protocol. DNA analysis determined that none of 16 hair samples collected in 2002 were lynx. Results of samples collected in 2003 will be available next year. Seventeen miles of winter snow tracking surveys found no lynx tracks on the North Zone of the Forest. Twenty-five miles of winter tracking surveys on the Central Zone did not result in any observation of lynx tracks or sign.

Lynx habitat was evaluated on 17,456 acres in the Copper, Pelke, Upper West Branch, Blacktail, Sema and Kalispell Lynx Analysis Units on the North Zone. Walk-through inspections were made of these stands to validate whether they were lynx foraging or denning habitat. On the South Zone, 150 acres of potential lynx denning habitat were field checked. In proposed timber harvest units and adjacent to road closures, walk-through inspections were made to verify locations of lynx denning habitat. About 200 acres of possible lynx habitat was field surveyed on the Central Zone by U.S. Fish and Wildlife Service

and Forest Service biologists. Although some marginal habitat was located, no additional lynx habitat was added to Central Zone LAUs.

Bald Eagle: The bald eagle is a federally listed threatened species. Fifty-five bald eagle territories were known in the Idaho Panhandle in 2003. The following table shows the ten bald eagle nests on the Idaho Panhandle National Forests. An average of 1.8 chicks fledged per successful bald eagle nest on the national forest, compared to 1.6 chicks per successful nest for all ownerships across the Idaho Panhandle region.

- *NOTE - The Moyie nest was originally on Bureau of Land Management administered land. The eagles built a new nest on the national forest across the river which was named Caboose Creek.*

Table 19. 2003 Bald Eagle Productivity

Bald Eagle Nest	Number of chicks fledged	Ranger District	Year Discovered	Comments
Blacktail	0	Sandpoint	2003	New nest active but unsuccessful
Hoodoo Lake	2	Sandpoint	2002	
Kalispell Island	2	Priest Lake	2000	
Lower Priest River	No data	Priest Lake	2001	Nest wasn't checked in 2003.
Moyie / Caboose *	0	Bonners Ferry	1989	No activity (only single adult seen)
Monarchs	2	Sandpoint	2001	
Perkins Lake	1	Bonners Ferry	2002	Nest wasn't checked in 2003.
Robinson Lake	2	Bonners Ferry	1991	
Upper Priest Lake	0	Priest Lake	1992	No eagles observed.
Whiskey Rock	2	Sandpoint	2002	

The midwinter bald eagle count is a national survey that has been conducted annually since 1979. It is a cooperative effort of Idaho Department of Fish and Game, Bureau of Land Management, Coeur d'Alene Audubon Society, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers and the Forest Service.

Table 20. 2003 Midwinter Bald Eagle Count

Route	Eagles counted
Lake Coeur d'Alene	1 adult
St. Joe River	1 adult
Priest Lake and Priest River	4 adults
Kootenai River	5 adults
Hayden Lake	1 adult
TOTAL	**12 adult eagles**

Elk Habitat Potential: The elk is a management indicator species on the St. Joe and Coeur d'Alene River Ranger Districts. Elk habitat potential was not measured on the St. Joe Ranger District (Avery and St. Maries) or on the Coeur d'Alene River Ranger District (Fernan and Wallace) in 2003.

Table 21. Elk Habitat Potential Goals

District	District Standard (Goal)
Wallace	52% or higher
Fernan	48% or higher
Avery	65% or higher
St. Maries	53% or higher

Pileated woodpecker: The pileated woodpecker is a management indicator species on the Idaho Panhandle National Forests. The Coeur d'Alene Audubon Society was contracted to survey several areas of the Coeur d'Alene River Ranger District for pileated woodpeckers. Broadcast call surveys were conducted at 110 points on 7 routes. Pileated woodpeckers were found on 3 routes.

Table 22. Pileated Woodpecker Survey Results

Route	Pileated woodpeckers heard?
Shoshone	Yes
Hayden	No
Hayden	No
Big Creek	No
Big Creek	No
Shoshone	Yes
Skookum	Yes

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 23. Grizzly Bear Habitat Status - 2003

2002 BMU Status	BMU Acres	Acres Core	Percent Core	Open Road Density - Percent of BMU with >1mi. open road/sq. mi.	Total Road Density- Percent of BMU with >2 mi. total roads/sq. mi.
Goal =			**≥55**	**≤33**	**≤26**
SELKIRK BMUs:					
Ball-Trout	57,907	41,435	72	17	11
Blue-Grass	57,325	28,698	50	33	30
Boulder	62,368	30,484	49	31	35
Grouse (1)	66,979	27,651	32	59	59
Kalispell-Granite	85,641	40,251	48	28	27
Lakeshore	17,967	3,706	20	78	50
LeClerc	77,176	25,468	28	39	57
Long-Smith	65,737	48,203	73	21	13
Myrtle	63,781	38,272	57	30	21
North Lightning	65,216	39,713	61	38	20
Scotchman	61,612	38,848	63	35	27
CABINET-YAAK BMUs:					
Salmo-Priest	87,115	55,754	65	31	26
Sullivan-Hughes	78,210	48,294	59	23	21
Northwest Peaks (2)	82,995	45,929	55	28	26
Keno (3)	51,236	29,778	61	33	24

Footnotes:

(1) Acres not managed by the Forest Service are not included in core or road density calculations.
(2) Northwest Peaks – 18,588 acres are on the Idaho Panhandle National Forests.
(3) Keno – 23,054 acres are on the Idaho Panhandle National Forests

These seven BMUs met core and road density standards and guidelines in 2003: Ball-Trout, Keno, Long-Smith, Myrtle, Northwest Peaks and Salmo-Priest. The other eight BMUs did not meet one or more management criteria for grizzly bears in 2003.

Table 24. Core, Security, Road Density Standards and Guidelines - 2003

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

Forest Plan Monitoring Item F-3 Caribou Recovery

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

Background

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

Caribou are generally found in Engelmann spruce/subalpine fir and western redcedar/western hemlock forest types above 4,000 feet elevation in the Selkirk Mountains, but occasionally use valley bottom habitats in the Kootenai and Priest Lake Basins. Caribou are adapted to boreal forests and only occur in drier, low elevation habitats except as rare transients. Seasonal movements are complex. Caribou frequently cross the U.S. / Canada international border. Earlier 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.

Forty-one woodland caribou were counted in the 2003 winter aerial survey. The short-term trend for this population is stable. Monitoring of radio-collared caribou this year did not detect any losses from predation, although predation continues to be a significant factor that may impact caribou populations.

Caribou habitat conditions on 1,073 acres in the Selkirk Mountains were evaluated for suitability for woodland caribou.

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 2003.

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 reevaluated and redesigned as necessary. Implementation and effectiveness monitoring on the Forest during 2003 demonstrated that present and past projects were usually successful in meeting their intended objectives (see Forest Plan Monitoring Item K-1 for the results of fiscal year 2003 BMP monitoring).

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. Halsey Creek and Big Elk Creek on the Coeur d'Alene River Ranger District and Long Canyon Creek on the Bonners Ferry Ranger District are three watersheds that were analyzed for this report.

WATSED Validation Modeling

Three validation-monitoring watersheds (Halsey Creek, Big Elk Creek, and Long Canyon) were analyzed in the 1999 Forest Plan Monitoring report for the purpose of comparing assessments and calculations to the WATSED sediment prediction model. Following are the results of current assessments updated with additional data through water year 2003.

Table 25. Halsey Creek WATSED / Measured Sediment and Flow Comparisons

		WATSED Sediment	MEASURED Sediment	WATSED Runoff	MEASURED Runoff	WATSED Runoff	MEASURED Runoff
				Peak month Q	Peak month Q (cfs)	Duration	Duration
	T/mi^2/yr	T/yr	T/yr	(cfs)	(cfs)	Time > 75% Qp (days)	Time > 75% Qp (days)
"natural"	24.5	120		24.7		32.0	
area (mi2)	4.9						
1984		203	34	25	23	33	62
1985		203	32	25	29	33	32
1986		203	28	25	23	33	19
1987		198	24	25	24	33	48
1988		198	25	25	32	33	24
1989		198	27	25	40	33	28
1990		198	35	25	39	33	28
1991		198	50	25	27	33	57
1992		198	46	25	11	33	36
1993		198	42	25	39	33	36
1994		207	21	25	17	35	27
1995		207	46	25	38	35	33
1996		203	58	25	30	35	84
1997		212	71	25	41	35	26
1998		209	50	25	26	35	35
1999		204	46	25	40	35	45
2000		202	150	25	43	35	29
2001		198	150	25	19	35	22
2002		198	156	25	45	34	53
2003		198	44	25	26	34	36
	Averages	202	57	25	31	34	38
	Per mile^2	41.4	11.6	5.1	6.3		

Table 26. Big Elk Creek WATSED / Measured Sediment and Flow Comparisons

		WATSED Sediment	MEASURED Sediment	WATSED Runoff	MEASURED Runoff	WATSED Runoff	MEASURED Runoff
				Peak month Q	Peak month Q (cfs)	Duration	Duration
	T/mi^2/yr	T/yr	T/yr	(cfs)	(cfs)	Time > 75% Qp (days)	Time > 75% Qp (days)
"natural"	20.8	241		71.2		32	
area (mi2)	11.6						
1988		1,387	7	78	139	41	25
1989		1,387	54	78	160	40	28
1990		1,387	100	78	121	40	29
1991		1,387	357	78	87	40	44
1992		1,387	339	77	49	40	48
1993		1,387	353	77	116	39	34
1994		1,387	108	77	69	39	31
1995		1,387	145	77	106	39	41
1996		1,387	226	76	110	39	94
1997		1,387	383	76	223	39	28
1998		1,387	359	76	85	39	51
1999		1,387	262	78	143	40	46
2000		1,387	228	77	137	40	36
2001		1,387	219	77	71	40	22
2002		1,387	287	77	141	39	50
2003		1,387	213	76	93	39	41
	Averages	1,387	227	77	116	40	40
	Per mile^2	119.6	19.6	6.6	10.0		

Table 27. Long Canyon WATSED / Measured Sediment and Flow Comparisons

		WATSED Sediment	MEASURED Sediment	WATSED Runoff	MEASURED Runoff	WATSED Runoff	MEASURED Runoff
				Peak month Q	Peak month Q (cfs)	Duration	Duration
	T/mi^2/yr	T/yr	T/yr	(cfs)	(cfs)	Time > 75% Qp (days)	Time > 75% Qp (days)
"natural"	18.9	563		236.4		32.0	32
area (mi2)	29.8						
1985		563	191	239	310	33	25
1986		563	161	239	302	33	28
1987		563	158	239	252	33	29
1988		563	183	239	225	33	34
1989		563	312	239	254	33	52
1990		563	403	239	269	33	33
1991		563	458	239	273	33	40
1992		563	361	239	162	33	35
1993		563	351	239	254	33	26
1994		563	306	243	232	35	42
1995		563	342	243	272	35	31
1996		563	423	243	326	35	33
1997		563	683	241	507	35	31
1998		563	685	241	273	35	26
1999		563	587	241	385	35	33
2000		563	307	241	271	35	44
2001		563	223	241	189	35	28
2002		563	216	241	377	34	30
2003		563	227	377	320	34	25
	Averages	563	346	248	287	34	33
	Per mile^2	18.9	11.6	8.3	9.6		

In the two TePee Creek tributary watersheds (Halsey and Big Elk Creeks), substantial differences between estimated sediment delivered from the WATSED model and measured total sediment yields continue to be evident with the inclusion of water year 2000 to 2003 data.

The divergence could be related to over-estimations by WATSED, or from sampling error related to inadequate timing or frequency of bedload measurements in these watersheds. The pattern of consistent overestimates in both watersheds suggests a systematic error may be in place. These will be investigated so that either the sampling techniques or the model calibration can be adjusted for more consistent results.

The stream flow estimates from WATSED and measured flows are consistent with each other.

Forest Plan Monitoring Item G-3/G-1: Validate Fish Habitat Trends

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

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

The Inland Native Fish Strategy (aka INFISH) amended the Forest Plan in 1995. INFISH outlines eight additional riparian goals that "establish an expectation of the characteristics of healthy, functioning watersheds, riparian areas, and associated fish habitats" (USDA Forest Service 1995).

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-3: Validate Fish Habitat Trends

Threshold: A declining trend in fish habitat quality.

Reporting period: 5 years

We conduct stream surveys and monitor habitat conditions across the forest to evaluate parameters to provide baseline information for monitoring trends of habitat composition, quality, and complexity. Common parameters include, but are not limited to, habitat composition, pool conditions, large woody debris amounts and conditions, substrate composition, and water temperature. Some surveys are only conducted once, while others are monitored multiple years at the same location.

This report focuses mainly on water temperature monitoring across the forest. Other habitat information is also presented.

Temperature Monitoring

Stream temperature is a critical element of water quality because it influences the biological communities that inhabit stream systems. Trout and char are sensitive to stream temperatures because it affects their metabolism, growth rates, food requirements, and the timing of life history events such as migration and spawning. Stream temperatures vary temporally (with the seasons and over the course of 24 hours) and spatially (over the length of a stream). There are a number of factors that play critical roles in how stream temperatures change and how these changes may affect fish survival. Water temperature is the most common water-quality violation in the Pacific Northwest (Donato 2002). The Idaho Department of Environmental Quality (DEQ) and the Environmental Protection Agency have developed steam-temperature standards to protect cold-water species.

The following are the temperature requirements for Cold Water Biota as established by DEQ in the Idaho Administrative Code (IDAPA 58.01.02 – Water Quality Standards and Wastewater Treatment Requirements; Section 250), and the EPA bull trout temperature criteria (40 CFR 131.E.1.i.d (1997)). These were the criteria and standards used for exceedance criteria:

250: SURFACE WATER QUALITY CRITERIA FOR AQUATIC LIFE USE DESIGNATIONS:

02. Cold Water. Waters designated for cold water aquatic life are to exhibit the following characteristics (3-15-02):

b. Water temperatures of twenty-two (22) degrees C or less with a maximum daily average of no greater than nineteen (19) degrees C (8-24-94);

f. Salmonid spawning: waters designated for salmonid spawning are to exhibit the following characteristics during the spawning period and incubation for the particular species inhabiting those waters (8-24-94):

i. Water temperatures of thirteen (13) degrees C or less with a maximum daily average no greater than nine (9) degrees C (8-24-94).

g. Bull Trout Temperature Criteria. Water temperatures for the waters identified under Subsection 250.02.g.i. shall not exceed thirteen degrees Celsius (13C) maximum weekly maximum temperature (MWMT) during June, July and August for juvenile bull trout rearing, and nine

degrees Celsius (9C) daily average during September and October for bull trout spawning. For the purposes of measuring these criteria, the values shall be generated from a recording device with a minimum of six (6) evenly spaced measurements in a twenty-four (24) hour period. The MWMT is the mean of the daily maximum water temperatures measured over the annual warmest consecutive seven (7) day period occurring during a given year (3-30-01).

i. The bull trout temperature criteria shall apply to all tributary waters, not including fifth order main stem rivers, located within areas above fourteen hundred (1400) meters elevation south of the Salmon River basin-Clearwater River basin divide, and above six hundred (600) meters elevation north of the Salmon River basin-Clearwater basin divide, in the fifty-nine (59) Key Watersheds listed in Table 6, Appendix F of Governor Batt's State of Idaho Bull Trout Conservation Plan, 1996, or as designated under Sections 110 through 160 of this rule (3-23-98).

03. Season Cold Water. Between summer solstice and autumn equinox, waters designated for seasonal cold-water aquatic life are not to vary from the following characteristics due to human activities. For the period from autumn equinox to summer solstice the cold water criteria will apply (3-15-02):

b. Water temperatures of twenty-six (26) degrees Celsius or less as a daily maximum with a daily average of no greater the twenty-three (23) degrees C (3-30-01).

EPA Bull Trout Criteria (40 CFR 131.E.1.i.d (1997)

This rule establishes a maximum weekly maximum temperature (MWMT) criterion of 10° C for the months of June, July August and September for the protection of Bull trout spawning and rearing in natal streams, expressed as an average of daily maximum temperatures over a consecutive 7-day period.

Coeur d'Alene River Ranger District

The following is summarized from the *Coeur d'Alene River Ranger District Monitoring Report for Preliminary Analysis of Water Temperature and Fish Habitat Data* by E. L. Lider and M. A. Davis, 2004.

Temperature data was used to examine the frequency that streams within the Coeur d'Alene River Ranger District met or exceeded the state and federal water quality criteria for temperature. Overall there were 81 streams sampled over a six-year period (1998-2003). One hundred ninety four sites were sampled. A number of sites were sampled at the same location in different years. Five streams were sampled at least three times during the study period and approximately ten streams were sampled at least twice. We evaluated 116 sites to determine if state water quality standards were met or exceeded. Ninety-one (91) sites were used to evaluate differences in thermograph locations within a watershed (i.e., upper, middle, and lower).

We examined the exceedance criteria by utilizing a frequency analysis tabulating the percent of days the criteria was exceeded for each thermograph. The data for Idaho cold-water aquatic life and seasonal cold water indicted that the criteria were very seldom exceeded (Table 28). Our data indicated that the sites on the main Coeur d'Alene River were the areas where the cold water criteria were exceeded, generally watersheds > 16,000 hectares. In watersheds < 16,000 hectares these criteria were generally not exceeded.

Table 28. Percent of Readings that Exceeded Coldwater and Seasonal Criteria for Streams on the Coeur d'Alene River Ranger District, Idaho, 1998-2003

Range Exceeded	Cold water 22ºC	Coldwater 19ºC	Seasonal 26ºC	Seasonal 23ºC
0	93	89	98	99
1-20	6	3	2	1
21-40	1	6	0	0
41-60	0	0	0	0
61-80	0	1	0	0
81-100	0	0	0	0

We also looked at the Idaho State bull trout rearing, the Idaho State bull trout spawning, and the EPA bull trout criteria. With these stricter requirements we saw a greater range of streams and times when the criteria were exceeded (Figure 4 and 5).

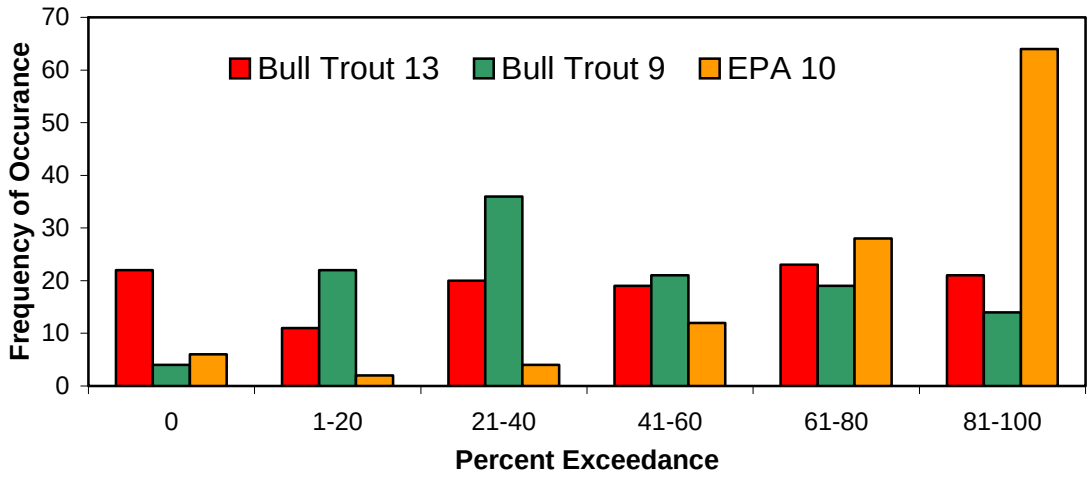


Figure 4. The frequency that the State of Idaho bull trout rearing and bull trout spawning, and EPA bull trout criteria were exceeded (percent of days criteria were exceeded) at 116 sites within the Coeur d'Alene river basin, Idaho. 1998 – 2003

We found that the EPA bull trout criteria were exceed 60 percent of the time at about 90 of the sites we sampled (Figure 5). This trend was not seen in the State's criteria for bull trout (9°), the main difference being the time periods to which the criteria applies. The State's 9° criteria is for fall spawning August 15th through November 15th, when water temperatures are falling. The EPA and the State's 13° are spring criteria, with the EPA being more stringent with a longer period of evaluation (approximately 60 days).

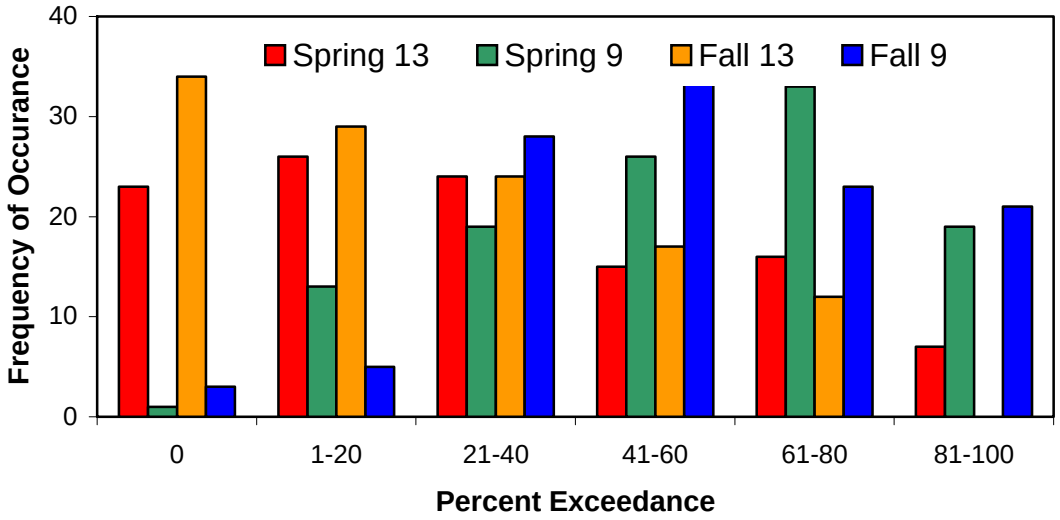


Figure 5. The frequency that the State of Idaho Spring and Fall (13 and 9 degree) criteria were exceeded (percent of days criteria were exceeded) at 116 sites within the Coeur d'Alene river basin, Idaho. 1998 – 2003

When evaluating data for exceedance criteria one needs to look at the dates for which the criteria is applicable and potentially adjust. For example when looking at Idaho salmonid spawning criteria in the spring, one is supposed to use the period of April 15th through July 15th. We were not able to deploy many of our thermographs till late May or early June. By not deploying until June 1st for the spring criteria, about 50 percent of the sample period is lost. Our winter and early spring data (Table 29) shows that average monthly maximum temperatures and 7 day average highs did not exceed the thirteen degree criteria and only exceed the nine degree criteria during late May in the larger river systems (greater than 16,000 hectares). In most of the salmonid spawning tributaries it is believed that both the nine and thirteen degree criteria would not be exceeded until June. If this assumption was used in the criteria calculation for spring data, the days that the spring criteria would be exceed would be much less than in Figure 5. We feel that the spring exceedance figures would be similar to those seen for the fall 13 criteria in Figure 5.

Table 29. **Sample Size, Average High Temperature, Median High Temperature, 7-day Average High Temperatures and Ranges for Five Months Within the Coeur d'Alene River Basin, Idaho, 1999 through 2003**

Month	Sample Size (ºC)	Average High (ºC)	Median (ºC)	Range Average High (ºC)	7-day Average High (ºC)	Range 7-day average high (ºC)
February	4	1.63	1.6	1.3-2.0	1.73	1.2-2.3
March	4	2.43	2.45	2.1-2.7	2.13	1.9-2.3
April	7	5.03	5.2	4.3-5.9	4.93	4.3-5.7
May	21	8.59	8.7	5.7-10.8	8.45	5.4-10.7
June	21	12.90	12.5	8.6-16.9	12.46	8.5-16.3

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

The following is condensed from the *Idaho Panhandle National Forests Temperature Monitoring (April 29, 2004)* by Kevin Davis.

The North Zone implemented a temperature monitoring program in 1999. The streams in the monitoring program included Hughes Creek, and Cedar Creek on Priest Lake Ranger District, and Grass Creek on Bonners Ferry Ranger District. The following year, as more temperature data loggers were obtained more streams were incorporated into the program. In particular, temperature concerns were recognized in the West Fork of Gold Creek, a tributary to Gold Creek at the south end of Lake Pend Oreille on the Sandpoint Ranger District. Temperature data loggers were placed in several locations across much of the length of the stream. In 2001, 29 data loggers were placed in streams in the Priest Lake and Sandpoint Ranger Districts. In 2002, 12 data loggers were deployed in Priest Lake and 25 data loggers were deployed in Sandpoint. The same number of data loggers was deployed in both Ranger Districts in 2003. Ten more data loggers will be deployed across the North Zone for the 2004 field season.

The objective of this report is to summarize the data collected thus far on the Sandpoint Ranger District. Temperature data is summarized by year and by the respective watershed. Data from all years available at each site was used to summarize the number of days recorded and percent exceedance values with respect to *EPA bull trout temperature standards*. A summarization of the EPA data follows. Data from all sites was also used to summarize the number of days and percent exceedance values with respect to *Idaho bull trout temperature standards*. Maximum temperatures within the juvenile rearing and spawning evaluation periods are provided to enumerate the extent to which standards were exceeded. For the Juvenile rearing period this number is expressed as the MWMT (maximum weekly maximum temperatures) and for the spawning period this number is expressed as the daily average. MWMT is also expressed as the 7-day average of the high temperature. The chart with *Idaho bull trout temperature standard* information follows the summarization of EPA data.

Lightning Creek Watershed

Stream temperatures in the Lightning Creek watershed have been recorded in some tributaries for a total of three years beginning in 2001. There were 12 sites sampled (three on main Lightning Creek, two in EF Lightning and Rattle Creek, one each in Morris, Porcupine, Wellington, Quartz, and WF Blue creeks). The sites selected thus far give a broad representation of the watershed, from north to south, and east to west. The data collected shows that temperatures throughout the watershed exceed EPA bull trout standards.

Percent exceedance values range from a low of 52 percent in 2002 and 2003 in upper East Fork Lightning Creek, the lowest in the watershed, to 100 percent in several watersheds on successive years. No obvious trends are apparent from the data collected thus far. However, MWMT exceed the EPA standard of 10 degrees Celsius for bull trout spawning and rearing by more than 2 degrees, but not more than 10 degrees Celsius, calculated from an average of MWMT values for all years recorded. The highest temperature recorded was in Lightning Creek above the EF Lightning confluence with a reading of 19.68 degrees Celsius. It must be noted that these are the highest values for MWMT and do not reflect temperatures across the period of data recording, merely the highest temperature obtained for the period of record. The lowest MWMT recorded was in the West Fork of Blue Creek with a reading of 13.77 degrees Celsius. Watersheds such as Morris Creek, with relatively low levels of management disturbance, high elevation, and good thermal cover, exceed the EPA standards over 60 percent for all three years of record. The West Fork of Blue Creek, often referred to as a reference watershed for Lightning Creek, exhibited 85 percent exceedance in 2003. As would be expected, data from the upper portions of watersheds have

better compliance with EPA standards than data from lower in the watershed. Rattle Creek is anomalous to this observation in that the lower portion of the watershed exhibits higher compliance than the upper portions.

Exceedance values with respect to Idaho bull trout standards are slightly less, meaning higher compliance. Percent exceedance was derived from the total number of days counted in juvenile rearing and spawning. No obvious trends are apparent from the data collected with respect to Idaho bull trout exceedance values. However, MWMT and maximum average daily temperatures exceed the Idaho standard for bull trout spawning and rearing by more than .4 degrees, but not more than 6 degrees Celsius, calculated from an average of MWMT and average daily temperature values for all years recorded. The Upper East Fork of Lightning Creek, Quartz Creek, and Upper and Lower Rattle Creek exhibited the lowest percent exceedance values with 7, 4.5, 7, and 4 percent, respectively, all in the year 2002. Upper EF Lightning Creek has never exceeded the Juvenile rearing standard in all years recorded. Lower Lighting Creek, Lightning Creek above the EF Lighting confluence, and lower EF Lightning had the highest values, with 89 percent in 2001. Sections of compliance occur within the Lightning Creek watershed in a few areas that exist closer to the headwater regions.

Gold Creek Watershed

Temperature monitoring in the Gold Creek watershed began in 2000 with temperature sensors placed at the mouth and upper Gold Creek, the mouth of West Gold mid-section and upper West Gold Creek, Kickbush Creek and Chloride Gulch. The data collected shows that temperatures throughout the watershed exceed EPA bull trout standards.

Percent exceedance values range from a low of 42 percent in lower Gold Creek in 2000 to 100 percent exceedance in lower and upper West Gold in 2001. No obvious trends are apparent from the data collected thus far. However, MWMT exceed the EPA standard of 10 degrees Celsius for bull trout spawning and rearing by more than 2 degrees, but not more than 6 degrees Celsius, calculated from an average of MWMT values for all years recorded. Lower Gold Creek exhibited the lowest temperatures recorded in the watershed, with a reading of 11.24 degrees Celsius in 2001. Stream temperatures are moderated in lower Gold Creek from significant input from groundwater sources just upstream from the confluence of Kickbush Creek with Gold Creek. The highest temperature recorded was in upper West Gold Creek with a reading of 16.39 degrees Celsius. Chloride Gulch exhibits high exceedance values but the average value of exceedance for all years recorded is about 2.8 degrees Celsius.

Exceedance values with respect to Idaho bull trout standards are significantly less. Percent exceedance was derived from the total number of days counted in juvenile rearing and spawning. Separate percent exceedance values for juvenile rearing and spawning are available on the DEQ temperature spreadsheets. In 2000, lower Gold Creek exhibited no exceedance of either juvenile rearing or spawning, and no exceedance of juvenile rearing in 2001 and 2003. Upper Gold Creek also exhibits low temperatures and did not exceed juvenile rearing in 2001 and 2002 and temperatures from 2001 to 2003 were less than 2 degrees Celsius above the bull trout spawning standard. Upper West Gold Creek had the highest value with 71 percent in 2001. Of the seven locations with temperature data in the Gold Creek watershed only one, upper West Gold, exceeded juvenile rearing values by more than 3 degrees Celsius. This is most likely due to the presence of an extensive beaver dam complex upstream. Exceedance of the spawning value of 9 degrees Celsius was collectively, for all recording sites, slightly higher. Stream temperatures within the evaluation dates of September 1st to October 31st seem to be more susceptible to thermal fluctuation. This is possibly due to lower summer flows. However, these values are not exorbitantly high and suggest that management of stream temperature within the Gold Creek watershed according to Idaho standards is potentially attainable.

Grouse Creek Watershed

Temperature monitoring in the Grouse Creek watershed began in 2001 with temperature sensors placed in upper Grouse Creek below the confluence with Plank Creek, lower Grouse Creek at the bridge in section 30, and one slightly above the confluence with the North Fork of Grouse Creek. Temperature sensors have also been placed in the South Fork of Grouse Creek and slightly below the confluence with the South Fork. Due to the flashy nature of this watershed we have experienced problems with low flows temporarily exposing the temperature sensors to ambient air. This appears to have occurred on upper Grouse and below South Fork Grouse data. The data collected shows that temperatures throughout the watershed exceed EPA bull trout standards.

Percent exceedance values range from a low of 73 percent in upper Grouse Creek in 2002 to 100 percent exceedance in lower Grouse above the North Fork confluence in 2001 and the section 30 bridge in 2001 and 2003. No obvious trends are apparent from year to year in the data collected thus far. However, MWMT well exceed the standard of 10 degrees Celsius for bull trout spawning and rearing in all locations in all years that data has been collected. Temperature sensors placed lower in the watershed exhibit 100 percent exceedance while temperature sensors placed higher in the watershed exhibit slightly lower exceedance values, but well above EPA standards. Values for year 2002 upper Grouse and below South Fork Grouse are suspect due to the extremely high temperature readings. This strongly suggests that they may have come out of the water due to decreasing summer flows. Temperature recordings of 20 degrees Celsius in the mid and lower sections of Grouse Creek can be a frequent occurrence. The lowest temperature recorded was in the South Fork of Grouse Creek with a reading of 17.88 degrees Celsius.

Exceedance values with respect to Idaho bull trout standards are less but still exceed a significant portion of the time. Percent exceedance was derived from the total number of days counted in juvenile rearing and spawning. Separate percent exceedance values for juvenile rearing and spawning are available on the DEQ temperature spreadsheets. Upper Grouse Creek exhibited the lowest percent exceedance value with 37 percent in 2001. Lower Grouse Creek in section 30 had the highest value with 91 percent. Of the five locations with temperature data in the Grouse Creek watershed all exceed juvenile rearing values by more than 4 degrees Celsius. Data from upper Grouse and below South Fork of Grouse is suspect due to temperature sensors coming out of the water. All of the sites exceeded the spawning value of 9 degrees Celsius by slightly more than 5 degrees Celsius. This set of data for the spawning period of record is likely more reliable since temperature sensors would have been moved to more persistently submerged locations in the stream. Vegetative cover is lacking in much of the Grouse Creek watershed and this could also influence higher readings at select sites. Temperature sensors placed at higher elevations in the main channel and in one or two tributaries may provide some insight on how localized the temperature problem is in the Grouse Creek watershed.

Granite Creek Watershed

Temperature monitoring in the Granite Creek watershed began in 2001 with temperature sensors placed in upper Granite Creek above the Road 278 crossing and lower Granite Creek at the 2711 Kilroy Road Bridge. No information was collected at these sites in 2002, but data collection was resumed at these sites in 2003. The data collected shows that temperatures throughout the watershed exceed EPA bull trout standards.

Percent exceedance values range from a low of 63 percent in upper Granite Creek in 2003 to 100 percent exceedance in lower Granite in 2001. No obvious trends are apparent from the two years of data collected thus far. However, MWMT exceed the standard of 10 degrees Celsius for bull trout spawning and rearing by more than 2.5 degrees at both locations. The highest temperature recorded was in lower

Granite Creek with a reading of 14.28 degrees Celsius in 2001. The lowest temperature recorded was in lower Granite Creek with a reading of 12.88 degrees Celsius in 2003.

Exceedance values with respect to Idaho bull trout standards are significantly less. Percent exceedance was derived from the total number of days counted in juvenile rearing and spawning. Separate percent exceedance values for juvenile rearing and spawning are available on the DEQ temperature spreadsheets. Upper Granite Creek exhibited the lowest percent exceedance value with 13 percent. One encouraging fact at this location is that juvenile rearing temperature standards of 13 degrees Celsius from June 1st to August 31st were not exceeded. Thus the 13 percent value represents the fall spawning period. Exceedance values for lower Granite Creek were relatively low as well at 21 percent. The maximum margin for exceeding the juvenile rearing standard was only 1.3 degrees Celsius at this site in 2001. Upper and lower Granite Creek sites exceeded the spawning value of 9 degrees Celsius by 3.8 and 1.77 degrees Celsius in 2003, respectively. These values are not exorbitantly high and suggest that management of stream temperature within the Granite Creek watershed according to Idaho standards is potentially attainable.

Trestle Creek Watershed

Temperature monitoring in the Trestle Creek watershed began in 2001 with temperature sensors placed in upper Trestle Creek in section 5 and lower Trestle Creek at the Forest Service boundary in section 11. Temperature data has been collected every year at the same locations since 2001. The data collected shows that temperatures in Trestle Creek exceed EPA bull trout standards.

Percent exceedance values with respect to EPA bull trout standards range from a low of zero percent in upper Trestle Creek in 2001 to 50 percent exceedance in lower Trestle Creek in 2003. There is a weak trend in the data of increasing exceedance values with successive years. For instance, the highest MWMT recorded in 2001 at the upper Trestle location was 8.99 degrees Celsius, where in 2003 it was 11.3. Exceedance of the EPA bull trout standard of 10 degrees Celsius is slight. The maximum MWMT for the three years of record at the lower location is 1.42 degrees and only 1.3 degrees at the upper location.

Exceedance values with respect to Idaho bull trout standards are substantially lower. Percent exceedance was derived from the total number of days counted in juvenile rearing and spawning. Separate percent exceedance values for juvenile rearing and spawning are available on the EPA temperature spreadsheets. Upper Trestle Creek exhibited the lowest percent exceedance value with zero percent in 2001 and the value at lower Trestle Creek is only slightly higher at two percent in 2002. Both locations recorded temperatures below the 13 degree Celsius value for juvenile rearing. Thus, the exceedance values represent temperatures during the fall spawning period when the 9 degree Celsius standard was exceeded by less than two degrees at both locations in all years of record. Of all streams monitored on the Sandpoint Ranger District, Trestle Creek exhibits the highest compliance with both EPA and Idaho bull trout temperature standards.

St. Joe Ranger District

Temperature data was collected in 10 reference streams, 13 streams associated with environmental assessments (NEPA area) and 2 streams associated with instream rehabilitation projects. The St. Joe Ranger District selected reference streams, which are distributed across the district and varying between managed and unmanaged watersheds, to utilize as sites for annual temperature monitoring (Table 30).

Table 30. St. Joe Temperature Monitoring Results

Stream Name	Sub-basin	Management status	Reason for monitoring	Days Bull Trout Summer Exceedance	Days Bull trout Spawning Exceedance
Medicine Creek	Upper St. Joe	Unmanaged	Reference	0	0
Red Ives	Upper St. Joe	Unmanaged	Reference	19	10
Gold Creek	Middle St. Joe	Managed	Reference	46	12
Loop Creek	North Fork St. Joe	Managed	Reference	60	21
Marble Creek	Middle St. Joe	Managed	Reference	64	18
East Fork Emerald	St. Maries	Managed	Reference	Lost	
West Fork St. Maries	St. Maries	Managed	Reference/rehab project	72	18
Little North Fork Clearwater	Upper Little North Fork Clearwater	Managed	Reference	36	11
Lund Creek	Little North Fork Clearwater	Unmanaged	Reference	25	8
Heller Creek	Upper St. Joe	Managed	Rehab project	0	7
Eagle Creek	Upper St. Joe	Managed	Reference	42	14
Entente Creek	Quartz Cr	Managed	Assessment area	41	12
Little Bear	Marble	Managed	Assessment area	0	11
Homestead	Marble	Managed	Assessment area	0	5
Lower Norton	Marble	Managed	Assessment area	27	12
Upper Norton	Marble	Managed	Assessment area	0	1
Bear	Marble	Managed	Assessment area	0	3
Toles	Marble	Managed	Assessment area	7	12
Bussel	Marble	Managed	Assessment area	42	12
Lines	Marble	Managed	Assessment area	2	11
Hobo	Marble	Managed	Assessment area	11	9
West Fork Hobo	Marble	Managed	Assessment area	0	7
Lower Cranberry	Marble	Managed	Assessment area	17	11
Upper Cranberry	Marble	Managed	Assessment area	0	7

Habitat Restoration Projects

Many habitat restoration projects have been implemented over the past five years. Over 60 miles of stream have been improved, enhanced, or restored across the forest either through direct instream projects (e.g., placement of large woody debris, removal or upgrades of culverts and other fish migration barriers) or indirect projects in the watershed that benefit aquatic habitat (e.g., road decommissioning, riparian planting). The following are some examples of habitat restoration projects that have been accomplished over the past five years.

Tepee Creek Channel Restoration: Approximately one mile of previously channelized stream was reconstructed to provide better habitat for westslope cutthroat trout on the Coeur d'Alene River Ranger District. A new channel was constructed with meanders, pools, large wood, and cover.

Heller Creek Habitat Improvement: Habitat on Heller Creek, a bull trout stream on the St. Joe River Ranger District, was improved by adding large woody debris structures to the channel and creating pools and cover. Other streams in which habitat was improved by installing instream structures include, but are

not limited to, Big Elk, Hamilton, Big Hank, Jim, and Spruce creeks on the Coeur d'Alene River Ranger District; and Bird Creek on the St. Joe Ranger District.

Kickbush Slide Repair Project: An over-steepened cutslope on a Forest Service road that continually sloughed fine sediment into an important bull trout spawning reach on Gold Creek (Sandpoint Ranger District) was stabilized.

Fish Passage Projects have been done through removal or upgrades of culverts at road crossings. Some streams on which fish migration barriers were removed include Fedar Creek on Priest Lake Ranger District; Wylie, Plank, and Chute creeks on Sandpoint Ranger District; Skin and Grass creeks on Bonners Ferry Ranger District; Cottonwood, Jim, NF Hayden, and Spruce creeks on the Coeur d'Alene River Ranger District; and Bluebird and Turner creeks on the St. Joe Ranger District.

Restoration Effectiveness Monitoring

Effectiveness monitoring objectives in the past have either not been incorporated into restoration design or a lack of monies available have kept this type of work from being conducted. Typically the latter is the rule; however, Jordan Creek on the Coeur d'Alene River Ranger District is one stream analyzed that has had nine years of data collected after restoration was completed.

The stream lacked large woody debris due to wildfire and streamside road building activities; hence the purpose was to create pools through the addition of large woody debris over 1.1 km (0.7 miles) of stream. Two hydrological events occurred during the time the effectiveness monitoring was conducted, a 100-year flood (2/9/96) and a 10-year flood (4/2002). Surveys in the restored channel site included: 1) habitat cross-section and stream surveys that identified individual habitat units, which include several physical measurements; and 2) electrofishing was conducted to determine fish occupancy in the restored site pre- and post-project implementation. From these surveys, pool habitat increased by 2 percent, large woody debris increased by 58 percent and fish densities increased by 45 percent in the restored section of the stream. The overall assessment concluded that channel form, pooling, and grade control within structure placement were maintained. The percentage of pool habitat remained constant in the restored section of the channel until the large winter flood of 1996, after this event the percentage of pools was reduced significantly ($\rho<0.05$). The replication of stream surveys to make conclusions on monitored stream variables can be misleading due to the observer variability and due to "data decay" that occurs over time. However, new technology (i.e. GPS), well-developed and repeatable methodologies, well trained field collection crews, and excellent documentation can assist in avoiding some of the inherent problems of survey data.

Habitat Surveys (2003)

Coeur d'Alene River Ranger District: Fifty-five miles of habitat data was collected as part of the westslope cutthroat trout telemetry project in 2003-2004.

North Zone (Bonners Ferry, Priest Lake, and Sandpoint Ranger Districts): Physical habitat surveys (R1/R4) were completed within the Kootenai, Pend Oreille, and Priest basins for a total of 41 miles (Table 31).

Table 31. Physical Habitat Surveys (R1/R4) Completed on the North Zone by Major Basins

River Basin	Drainage	Mileage	Years
Kootenai	Copper Creek	4.0	2002
	Spruce Creek	3.6	2002-2003
Pend Oreille	Gold Creek	5.5	2002-2003
	Kickbush	2.5	2002-2003
	Chloride	2.2	2002-2003
	Granite Creek	4.0	2002-2003
	Lightning Creek	7.2	2002-2003
	Pack River	3	2002-2003
Priest	Reeder Creek	0.5	1999
	Kalispell Creek	5.0	2001-2002
	Granite Creek	3.1	2002
	Upper West Branch	0.4	2002

St. Joe Ranger District: Quantitative habitat surveys were conducted on approximately 17.2 miles of stream. Approximately 15.8 miles were within the Marble Creek drainage and were surveyed in preparation for the Bear Bussel Ecosystem Analysis at the Watershed scale (EAWS). Detailed information regarding these surveys is presented in that EAWS. The remaining 1.4 miles was surveyed to establish baseline information prior to a stream rehabilitation project in the West Fork of the St. Maries River.

Effects of INFISH on Habitat

The 1992 monitoring report indicated an apparent declining trend in fish habitat quality across the forest and attributed it primarily to timber harvest and road building (USDA Forest Service 1992). In 1995, the Forest Plan was amended by INFISH, which created Riparian Habitat Conservation Areas (RHCAs) and directed that activities in RHCAs benefit aquatic resources and not retard the attainment of Riparian Management Objectives (RMOs) (USDA Forest Service 1995). INFISH encourages passive restoration of riparian systems and aquatic habitat by maintaining, and not retarding attainment of, RMOs.

There is a long term, tri-region project underway to evaluate the effects of land management activities on aquatic and riparian communities at multiple scales and assess whether management direction, implemented through INFISH and its anadromous cousin PACFISH and their respective Biological Opinions, is effective in maintaining or improving aquatic and riparian conditions at both the landscape and watershed scales on federal lands. The PIBO Effectiveness Monitoring Project is in its first 5-year sampling cycle. It will be several more years (2006 and beyond) before conclusions can be made through this effort. The Idaho Panhandle National Forests is one of the forests the PIBO team is monitoring.

Forest Plan Monitoring Item G-4: Fish Population Trends

Threshold: Downward trend

Reporting Period: 2 years

In addition to the goals listed above in Item G-3, the 1987 Forest Plan lists the following goals related to fish populations:

- Provide for diversity of plant and animal communities.
- Manage vertebrate wildlife habitat to maintain viable populations of all species.

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

Current Status of Bull Trout and Westslope Cutthroat Trout

Bull trout were listed on June 10, 1998 as Threatened under the Endangered Species Act (ESA). Westslope cutthroat trout are listed as "sensitive" by Region 1 of the USDA Forest Service and are listed as "species of special concern" by the State of Idaho. The USFWS lists westslope cutthroat trout as a "Species of Concern" with respect to section 7(c) of ESA. The USFWS found that listing the westslope cutthroat trout was not warranted on April 14, 2000. A status review was conducted in 2003 and included IPNF biologists.

General Population Trends

Based on current information, bull trout and westslope cutthroat trout populations appear to be stable throughout most of north Idaho. Redd count data in the Pend Oreille basin show that bull trout populations are stable and may be increasing (Table 32), while populations in the Priest basin appear to be declining overall but increased in 2003 (Table 33), and populations in the St. Joe basin appear mixed (Table 34).

Population trend data from Idaho Fish and Game snorkel counts show that cutthroat trout populations in the Coeur d'Alene River basin appear to be increasing (Figure 6), although numbers of larger fish (>300 mm) may not be (Figure 7).

Table 32. Number of Bull Trout Redds Counted per Stream in the Lake Pend Oreille Drainage, Idaho, 1983-2003 (from Downs and Jakubowski 2003)

Stream	1983 [j]	1984	1985	1986 [j]	1987[j]	1988	1989	1990	1991[a]	1992	1993	1994	1995[b]	1996	1997 [f]	1998	1999	2000 [e]	2001[d]	2002[d]	2003[d]
CLARK FORK R.	--	--	--	--	--	--	--	--	--	2	8	17	18	3	7	8	5	5	6	7	8
Lightning Cr.	28	9	46	14	4	--	--	--	--	11	2	5	0	6	0	3	16	4	7	8	8
East Fork	110	24	132	8	59	79	100	29	--	32	27	28	3	49	22	64	44	54	36	58	38
Savage Cr.	36	12	29	--	0	--	--	--	--	1	6	6	0	0	0	0	4	2	4	15	7
Char Cr.	18	9	11	0	2	--	--	--	--	9	37	13	2	14	1	16	17	11	2	8	7
Porcupine Cr.	37	52	32	1	9	--	--	--	--	4	6	1	2	0	0	0	4	4	0	0	5
Wellington Cr.	21	18	15	7	2	--	--	--	--	9	4	9	1	5	2	1	22	8	7	7	8
Rattle Cr.	51	32	21	10	35	--	--	--	--	10	8	0	1	10	2	15	13	12	67	33	37
Johnson Cr.	13	33	23	36	10	4	17	33	25	16	23	3	4	5	27	17	31	4	34	31	0
Twin Cr.	7	25	5	28	0	--	--	--	--	3	4	0	5	16	6	10	19	10	1	8	3
Morris Cr.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	1	0	7	1
Strong Creek	--	--	--	--	--	--	--	--	--	--	--	--	--	2	--	--	--	--	--	0	--
NORTH SHORE																					
Trestle Cr.	298	272	298	147	230	236	217	274	220	134	304	276	140	243	221	330	253	301	335	333	361
Pack River	34	37	49	25	14	--	--	--	--	65	21	22	0	6	4	17	0	8	28	22	24
Grouse Cr.	2	108	55	13	56	24	50	48	33	17	23	18	0	50	8	44	50	77	18	42	45
EAST SHORE																					
Granite Cr.	3	81	37	37	30	--	--	--	--	0	7	11	9	47	90	49	41	25	7	57	101
Sullivan Springs	9	8	14	--	6	--	--	--	--	0	24	31	9	15	42	10	22	19	8	15	12
North Gold Cr.	16	37	52	8	36	24	37	35	41	41	32	27	31	39	19	22	16	19	16	24	21
Gold Cr.	131	124	111	78	62	111	122	84	104	93	120	164	95	100	76	120	147	168	127	203	126
Total 6 index streams [c]	570	598	671	290	453	478	543	503	423	333	529	516	273	486	373	597	541	623	566	691	591
Total of all streams	814	881	930	412	555	478	543	503	423	447	656	631	320	610	527	726	705	732	703	878	812

[a]Represents partial counts due to early snow fall (E. Fk. Lightning not included in index count)

[b]Observation conditions impaired by high runoff in all streams except Sullivan Springs, N. Gold and S. Gold creeks, and the Clark Fork River.

[c] Index streams include Trestle, East Fork Lightning, Gold, North Gold, Johnson, and Grouse Creeks.

[d] Includes an additional apprx. 0.5 km reach immediately upstream of index reach on Trestle Creek, which accounted for 4 additional redds in 2001 and 2002, and 2 in 2003.

[e] A headcut barrier prevented access to most of spawning area on Johnson creek in 2000, and also potentially on Granite Creek in 2001.

[f] 3 additional redds observed in Dry Gulch.

[j] Incomplete surveys on Porcupine and Grouse creeks in 1983, and on Grouse, Rattle, and E.Fk. Lightning creeks in 1986, and on Granite in 1987 of varying amounts. See Pratt (1984) and Hoelscher and Bjornn (1989).

Table 33. Description of Bull Trout Survey Locations and Transects Locations, Distance Surveyed, and Number of Redds Observed in the Priest River Drainage, Idaho, 1992-2003 (from DuPont et al. 2003)

Stream	Transect Description	Length (km)	1985	1986	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Upper Priest River	Falls to Rock Cr.	12.5	--	--	--	--	--	--	15	4	15	33	7	7	17	8
	Rock Cr. to Lime Cr.	1.6	--	--	--	2	1	1	2	0	3	7	0	2	0	0
	Lime Cr. to Snow Cr.	4.2	12[a]	5[a]	--	3	4	2	8	1	10	9	9	5	1	16
	Snow Cr. to Hughes Cr.	11.0	--	--	--	0	0	--	0	3	7	4	2	8	3	13
	Hughes Cr. to Priest Lake	2.3	--	--	--	0	0	--	0	--	--	0	0	--	--	--
Rock Cr.	Mouth to F.S. trail 308	0.8	--	--	0	0	--	--	2	1	0	--	0	0	0	--
Lime Cr.	Mouth upstream 0.8 km	1.2	4[b]	1[b]	0	0	--	--	0	2	0	1	0	0	0	0
Cedar Cr.	Mouth upstream 1.6 km	3.4	--	--	--	0	2	1	0	1	0	0	0	0	0	0
Ruby Cr.	Mouth to waterfall	3.4	--	--	0	0	--	--	--	0	0	--	--	--	0	--
Hughes Cr.	Trail 311 to trail 312	2.5	1	17	7	3	2	0	1	4	0	1	0	0	0	1
	F.S. road 622 to Trail 311	4.0	35[c]	2[c]	2	0	7	1	2	0	0	0	0	0	0	1
	F.S. road 622 to mouth	7.1	4[d]	0[d]	--	1	--	--	2	3	1	0	2	6	1	0
Bench Cr.	Mouth upstream 0.8 km	1.1	1	2	0	2	2	0	1	0	0	0	0	0	0	0
Jackson Cr.	Mouth to F.S. trail 311	1.8	--	--	4	0	0	0	0	0	0	--	--	--	0	0
Gold Cr.	Mouth to Culvert	3.7	24	23	5	2	6	5	3	0	1	1	9	5	2	2
Boulder Cr.	Mouth to waterfall	2.3	--	--	0	0	0	--	0	0	0	--	0	--	--	--
Trapper Cr.	Mouth upstream 0.8 km upstream from East Fork	5.0	--	--	--	4	4	2	5	3	8	2	0	1	0	0
Caribou Cr.	Mouth to old road crossing	2.6	--	--	--	1	0	0	0	0	0	--	--	--	--	--
MF East River	Bridge to Tarlac Creek	4.8														4
	Tarlac Cr. to Keokee Cr.	3.3	--	--	--	--	--	--	--	--	--	--	--	4	8	17
Uleda Creek	Mouth upstream 3.0 km	0.5	--	--	--	--	--	--	--	--	--	--	--	3	4	3
Upper Priest Lake Basin Only		70.5	80[e]	50[e]	18	18	28	12	41	22	45	58	29	34	24	41
All stream reaches combined		79.1	80[e]	50[e]	18	18	28	12[f]	41	22	45	58	29	41	36	65
Only those stream reaches counted during 1985-6		23.8[g]	80	50	14[h]	11	21[h]	8[f]	17	10	12	12	20	16	4	20

[a] Redds were counted from Lime Creek to Cedar Creek, which is about half the distance that is currently counted.

[b] Redds were counted from the mouth to FS road 1013, which is about 1/4 of the distance that is currently counted.

[c] About 2/3 of the distance was counted that is currently counted.

[d] Redds were counted from FS road 622 to the FS Road 1013, which is about 1/3 of the distance that is currently counted.

[e] Redds were counted in about 20% of the stream reaches where they are currently counted.

[f] Observation conditions impaired by high runoff.

[g] During 1985 and 1986 about 15 km of stream reach was counted..

[h] Two of the sites were not counted.

Table 34. Number of Bull Trout Redds Counted in the Upper St. Joe River and Tributaries in 1992 – 2002 (from DuPont et al. 2003)

Stream	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
St. Joe River - Heller Cr. To Lake[a]	10	14	3	20	14	6	0	10	2	11	3	9
Beaver Cr. And Bad Bear Cr.	2	2	0	0	0	0	1	--	--	--	--	--
Fly Cr.	--	--	--	0	0	--	2	--	--	--	--	--
Heller Cr.	0	0	--	0	--	1	0	--	0	--	--	--
Medicine Cr.[a]	11	33	48	26	23	13	11	48	43	16	42	28
Mosquito Cr.	--	--	--	0	4	--	2	--	--	--	--	--
Red Ives Cr.	--	0	--	1	0	1	0	--	0	--	--	--
Sherlock Cr.	0	3	--	2	1	1	0	--	0	--	--	--
Simmons Cr.	--	7	5	0	--	0	1	--	--	--	--	--
Wisdom Cr.[a]	1	1	4	5	1	0	4	11	3	13	9	9
Total (index streams)	22	48	55	51	38	19	15	69	48	40	54	46
Total (all streams)	24	60	60	54	43	22	21	69	48	40	54	46
[a]Bull trout index streams												

Figure 6. Cutthroat Trout Densities (IDFG snorkel data)

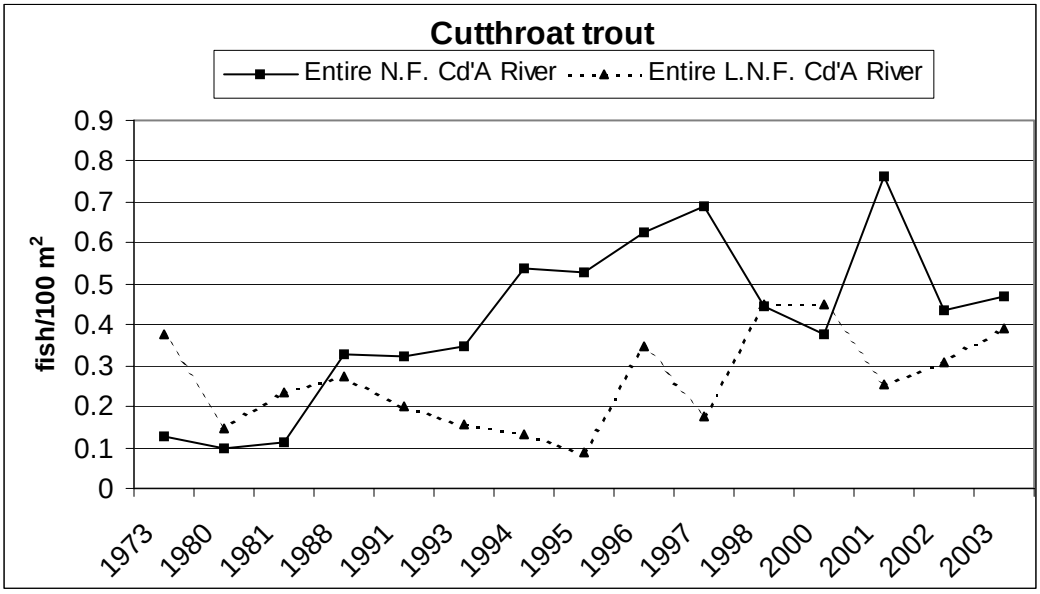
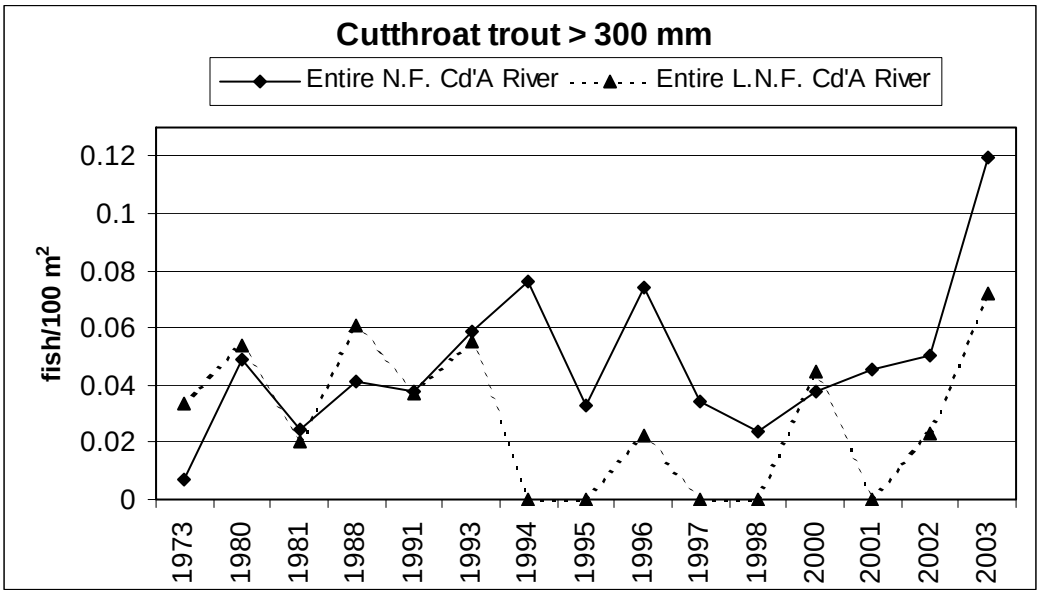


Figure 7. Densities of Cutthroat Trout >300 mm (IDFG snorkel data)



Population Surveys/Monitoring

Forest-wide

Torrent Sculpin Project: A graduate student sampled streams during 2002 and 2003 in order to determine the distribution and relative abundance of torrent sculpin on the forest. Of the 56 sites sampled, 32 percent contained torrent sculpin. Habitat variables significant to the distribution and relative abundance were also studied. Torrent sculpin were found at sites in the Coeur D'Alene River and St. Joe River systems, but none were found at sampled sites on the North Zone. Results of this study are documented in Quintela, J. G. 2004. Habitat variables affecting the distribution and density of torrent sculpin (Cottus rhotheus) in Northern Idaho. University of Idaho. Masters Thesis. 64 pp.

St. Joe Ranger District

Fish Assemblage Surveys: Electrofishing surveys were conducted on nine streams within the Marble Creek drainage in association to the preparation of the Bear Bussel Ecosystem Analysis at the Watershed scale (Table 35).

Table 35: Fish Density

Stream Name	Species	CPUE*	Fish/100m^2
Homestead	Westslope Cutthroat	0.022	3.8
Upper Homestead	None	0	0
Upper Bussel	Westslope Cutthroat	0.007	3.6
" "	Sculpin spp.	0.088	47.9
Upper Hobo	Westslope Cutthroat	0.027	3.9
Upper Hobo Tributary	None	0	0
Upper Marble	Westslope Cutthroat	0.006	0.5
Upper Norton	Westslope Cutthroat	0.027	12.0
" "	Sculpin spp.	0.022	9.7
Upper Norton Tributary	Westslope Cutthroat	0.056	26.0
Cornwall	None	0	0

* CPUE = catch per unit of effort

Bull Trout Redd Surveys: The St. Joe District conducted bull trout redd surveys on 11 streams in 2003. Six of these streams have been designated as permanent monitoring streams; i.e. at a minimum these streams will be monitored each year; Fly, Beaver, Red Ives, Heller, Sherlock and California Creeks. Idaho Fish and Game has also designated streams which will be surveyed each year: Medicine, Wisdom Creeks and the St. Joe River between Yankee Bar and Rambikur Falls. Additional streams will be surveyed as time and personnel are available. An additional five streams were surveyed this year because of volunteer assistance provided by students from the University of Idaho and the North Idaho Fly Casters, who accompanied Forest Service employees. No "definite" bull trout redds were observed in the eleven streams surveyed. "Possible" redds were observed in Sherlock, Heller, and Red Ives Creeks. The location and habitat conditions at "possible" redd sites included pool tail outs, gravel runs and riffles, and abundant woody debris. Substrate characteristics included small gravels that appeared brightly colored and cleared of debris.

Table 36. Number of Streams and Stream Miles Accomplished for Bull Trout Redd Surveys in the St. Joe River Drainage by the USFS, Idaho Fish and Game, and Cooperators, 1992-2003

	Year											
	1992	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
# of Streams	15	23	23	21	8	16	10	11	7	8	14	14
Stream Miles	~	46	51	40	11	31	20	23	12	28	36	27
# Streams with redds	6	10	3	4	5	6	5	2	4	3	5	3

Results from the 2003 bull trout redd surveys were similar to previous years, even with some known obstacles. Low stream flows and barriers to migration, including beaver dams and constructed rock dams, may have affected fish access and bull trout spawning activity in survey streams.

Coeur d'Alene River Ranger District

Westslope Cutthroat Trout Telemetry Project:

Together with Idaho Department of Fish and Game, we tagged and tracked 66 radio-tagged westslope cutthroat trout for over a year. This study has been a great success as we have learned many biological insights that we believe can help improve this fishery. We learned that the majority (>75%) of the cutthroat we put radio transmitters in tended to remain in the same general area as they were tagged. For example fish that were tagged in the Little North Fork or Tepee Creek remained in those streams. In general, the fish tended to move downstream throughout the year but long migrations (> 10 miles) were uncommon. The importance of this finding is that our fishing regulations have set up catch-and-release areas in the upper half of the Coeur d'Alene River basin. There was some concern that many of the fish in the catch-and-release area would migrate downstream to where they could be harvested and essentially make this regulation ineffective. Based on our findings, the current regulations should accomplish what it set out to do, which is provide a sizeable area where fish can grow old and large, as well as an area where limited harvest will be allowed for those who would like to keep a few fish for dinner.

Fishing regulations are only effective if they are followed. This study has pointed out areas where poaching may be impacting the fishery. In a 20-mile section of the North Fork Coeur D'Alene River where seven of our radio tagged fish spent barely over a month, six of these fish were killed by fisherman, three of which were caught illegally. Based on this information, increased patrols by Fish and Game officers and increased education could help reduce this impact.

During the month of September, we were able to quantify habitat characteristics in most of the Coeur D'Alene River where our radio tagged fish occurred. This data will be very valuable in helping determine if certain types of habitat important to cutthroat trout are limited or not. This type of information will help direct future restoration projects in the basin. We also placed thermographs in all sub-basins for this study. During the summer, we saw extremely warm water temperatures (>26°C) in the main river. Temperature data showed which stream reaches may provide cold-water refugia and which streams reaches may become too warm to support cutthroat trout during summer. Most of the fish held tight to some type of cover and moved very little during this period. When viewing these fish underwater, it appeared to be a struggle for some of them as many were laying on the bottom gasping for oxygen. Fishing during this time of year would probably be terrible as most of the fish we saw were not feeding or leaving the cover. A few fish made movements into side channels during this warm period and to our surprise when we measured the water temperature it was 3-5°C cooler than the main river. We have long known that side channels are important for juvenile and over-wintering fish, but finding out they can also provide a cool temperature refuge during summer is very important. This will increase our efforts to help protect the floodplain in the lower river where side channels typically would be found. When we snorkeled one of the cooler side channels during the heat of the summer we saw probably over 800 fish (cutthroat trout, rainbow trout and mountain whitefish) in an 80-meter length of stream.

Twenty-five of the fish we tagged died from fisherman, predators, or unknown causes. The 41 fish we tracked for extended periods should provide us valuable data on winter habitat use. In many systems it is believed that the quantity and quality of winter habitat often controls the number of cutthroat trout the system can support. The fish we tracked were scattered throughout the basin and appear to select areas with very slow water velocities in the winter. This may be

good news as it does not appear that fish have to migrate long distances to find suitable over-wintering habitat. Continued investigations are needed to further evaluate the quality of the winter habitat selected by cutthroat trout.

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

Fish abundance surveys were performed in several streams and rivers for establishing environmental baselines and delineating RHCA boundaries for various proposed land management projects. The accomplishments and summarization of those surveys are in Table 37.

Table 37. Summary of Fish Abundance Surveys Across the North Zone by Basin and 5th HUC Drainage*

Basin	Drainage	Method	Species	Streams (#)	Sites (#)
Kootenai	Unnamed trib to Blue Joe Creek	EF**	Westslope cutthroat trout	1	1
	Copper Creek	EF	Westslope cutthroat trout	2	4
	Kreist Creek	EF	Eastern brook trout	1	1
			Westslope cutthroat trout	1	2
	Spruce Creek	EF	Westslope cutthroat trout	1	1
	Placer Creek	EF	Westslope cutthroat trout	1	2
Pend Oreille	Gold Creek	EF	Westslope cutthroat trout	1	1
	Grouse	Snorkel	Westslope cutthroat trout	2	5
			Rainbow trout	2	3
			Eastern brook trout	2	5
			Bull trout	2	1
			Sculpin	1	1
	West Fork Blue Creek	EF	Westslope cutthroat trout	1	1
	Cascade Creek	EF	Eastern brook trout	1	1
	Riser Creek	EF	Westslope cutthroat trout	1	1
	Spring Creek	EF	Westslope cutthroat trout	1	1
			Eastern brook trout	1	1
Priest	Kalispell	EF	Westslope cutthroat trout	13	17
			Eastern brook trout	11	16
			Slimy sculpin	5	6
			N. pikeminnow	1	1
		Snorkel	Eastern brook trout	1	1
			Slimy sculpin	1	1
	Granite	EF	Westslope cutthroat trout	3	7
			Eastern brook trout	5	9
			Slimy sculpin	4	6

*Note that sites indicate more than one survey was completed per stream
**EF = electrofish

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

Forest Plan direction for sensitive and rare species, including plants, is to manage habitat to maintain population viability, prevent the need for federal listing, and to determine the status and distribution of Threatened, Endangered, 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 have yet to document populations or any highly suitable habitat in northern Idaho. In a recent report by the Idaho Conservation Data Center on predicting the distribution of potential habitat, very few of the plant associations known to host Ute's ladies-tresses occur in northern Idaho. The likelihood of Ute's ladies-tresses actually occurring in northern Idaho is remote. Removal of this species from the Idaho Panhandle National Forests threatened list will likely occur in the future, based on concurrence from the USFWS, which has the responsibility for this species.

In November of 2001, the USFWS listed the plant *Silene spaldingii* (Spalding's catchfly) as threatened. This long-lived perennial forb species is known from 52 sites in west-central Idaho, northwestern Montana, adjacent British Columbia, northeastern Oregon, and eastern Washington. In eastern Washington, this species is known from remnant patches of native bluebunch wheatgrass and fescue grasslands. This habitat is limited on National Forest lands to some low elevation areas in close proximity to the Palouse prairie, and breakland areas along the major river corridors. The USFWS has determined that habitat exists on the Idaho Panhandle 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 to 2003 to validate predicted habitat and search for populations. Potential habitat identified in proposed project areas is surveyed prior to implementation. No populations of Spalding's catchfly have been found to date on the Idaho Panhandle.

Sensitive Species: In March of 1999 the regional sensitive species list was updated, following the Region 1 Species-at-Risk Protocol. The new list contains 64 species listed as 'Sensitive' by the USFS. The Idaho Conservation Data Center 'tracks' a larger list of rare vascular and non-

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

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.

Candidate species are not addressed in Biological Assessments. This species is not currently listed on the Regional Forester's Sensitive Plant List, so it is not addressed as a Sensitive species in Biological Evaluations. According to Forest Service direction, potential effects of Forest Service projects on Candidate species will be considered in environmental planning. Slender moonwort is addressed as a Forest Species of Concern in planning documents because of concerns for its viability rangewide. 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 2003, Forest botany personnel and contractors performed on-the-ground clearance surveys on 6,158 acres of high potential habitats for TES and rare plants in support of various projects including timber, fire, 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 2003, surveys occurred on 78,689 acres of federal lands with the express purpose of documenting and protecting rare plant populations from management activities and mitigating potential adverse effects. In 2003, 6,158 acres were surveyed for sensitive and rare plants, a slight decrease from 2002. 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 2003), 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 2003, there were 20 element occurrences reported for the five northern counties.

There were several notable discoveries of rare plants on the Forest in 2003 by Idaho Panhandle National Forests and other personnel. The discoveries included 16 different sensitive plant species and four other rare plant species (FSOC). The new rare plant occurrences are displayed in the following table.

Table 38. New Rare Plant Occurrences, 2003*

Species	Common name	Status	Number of Occurrences
Botrychium lanceolatum	triangle moonwort	Sensitive	1
Buxbaumia viridis	green bug-on-a-stick moss	Sensitive	1
Carex hendersonii	Henderson's sedge	Sensitive	3
Cypripedium fasciculatum	clustered lady's-slipper orchid	Sensitive	5
Dryopteris cristata	crested shield fern	Sensitive	1
Lycopodium dendroideum	ground pine	Sensitive	1
Mimulus clivicola	bank monkeyflower	Forest Species of Concern	2
Phegopteris connectilis	northern beechfern	Sensitive	1
Platanthera orbiculata	round-leaved rein orchid	Forest Species of Concern	1
Rhizomnium nudum	Naked Mnium	Sensitive	1
Sanicula marilandica	black snakeroot	Forest Species of Concern	1
Symphyotrichum boreale	rush aster	Sensitive	1
Waldsteinia idahoensis	Idaho barren strawberry	Sensitive	1
Total new occurrences 2003			**20**

*Includes occurrences on IPNF lands only.

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 2003, monitoring plots for two sensitive species - Howell's gumweed (*Grindelia howellii*) and clustered lady's slipper (*Cypripedium fasciculatum*) – were sampled.

Howell's gumweed (*Grindelia howellii*) occurs on the St. Joe Ranger District of the 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 39. Howells's Gumweed (*Grindelia howellii*) Monitoring Results, 2003

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
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
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

*(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. Weed treatment and effectiveness monitoring have been conducted annually on the site since 1999. More monitoring

data are necessary before conclusions about the effects of the noxious weed treatments on population trends for Howell's gumweed can be determined.

The data for Howell's gumweed show a cyclical pattern of population demographics. Plot 3 was not established until 1996, and a sampling error in 1998 rendered the plot 3 data unusable. The trend from 1999 to 2003 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 45 and Plot 2 went from 349 to 130 and plot 3 fluctuated between 484 and from 289 plants. Nine 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 2004. 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 40. 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	-	-	-

*The Turn and Burn Timber Sale has not yet been logged. Sale units are marked and planned for sale in 2004, followed by harvesting in 2005.

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 2005. 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.

Conservation Strategies: In 2003, Forest botany personnel contracted the preparation of a conservation strategy for North Idaho Peatlands. The report 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. 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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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 - 2,582 (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 - 18

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 - 21

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 - 21

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

Forest Plan Monitoring Item J-1: Land Ownership Adjustments

Table 41. Land Ownership Adjustment

Year	Acres of Federal Land Disposed	Acres of Non-federal Land Acquired
1981	8,582	12,187
1982	2,960	5,728
1983	2,277	520
1984	3,718	3,126
1985	7,556	15,775
1986	8,044	9,815
1987	2,779	4,632
1988	3,097	3,164
1989	3,692	4,062
1990	2,376	3,281
1991	630	1,080
1992	0	10
1993	11,282	14,009
1994	294	370
1995	1,965	3,229
1996	35	40
1997	4,755	7,533
1998	3,728	2,077
1999	2,744	1,880
2000	1,350	1,920
2001	813	2,261
2002	1,143	1,798
2003	0	0
Total	**73,820**	**98,497**

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).

This years monitoring focused on the following:

1) Soil condition, large organic material, and BMP (Best Management Practices) effectiveness monitoring on 13 past harvest units in the Marble Creek watershed or its tributaries on the St. Joe/Avery Ranger District.

2) Organic matter, and soil displacement and compaction monitoring on the Kalispell timber sale on the Priest Lake Ranger District.

3) Foliar analysis for nutrients by tree species and rock type on the Avery Ranger District.

1. Monitoring on 13 past harvest units (1970-1995) on the St. Joe Ranger District were monitored for soil condition, large organic material, and BMP effectiveness.

a) Each unit was monitored and at each transect data point the soil condition was placed into three condition classes as described in the Soil Condition Assessment Process (Niehoff, 2002): Natural Condition (Class 1), Slight Disturbance (Class 2) or Detrimental Disturbance (Class 3).

Table 42. Soil Condition Assessment

Unit	Treatment	Area (acres)	Class1 (%)	Class 2 (%)	Class 3 (%)
48201015	Salvage	132	69	26	5
48402103	Salvage	42	50	50	
48403042	Clearcut	7	68	32	
48403041	Clearcut	7	90	10	
48403043	Clearcut	5	66	28	6
48101045	Liberation	19	100		
48502025	Patch	18	100		
48402025	Liberation	115	100		
48203091	Liberation	32	95	5	
48501091	Group Select	34	91	9	
48402051	Salvage	48	100		
48402115	Clearcut	19	100		
48403046	Clearcut	9	100		

Results show that the combined acreage of 13 units (487 acres) had 85 percent natural condition, 13 percent slight disturbance, and 2 percent detrimental disturbance. This meets the Regional and Forest Plan soil quality standards.

b) Values of large organic material ranged from 5 tons/acre to 52 tons/acre. Individual values in tons/acre are: 18, 5, 30, 7, 40, 41, 13, 52, 42, and 29. Three of the units were not monitored for large organic material.

c) Overall BMP Effectiveness, related to the Idaho Forest Practices Act (FPA), was qualitatively rated by monitoring teams. 8 units showed an overall effectiveness between 90 to 98 percent, 4 units between 80-90 percent, and one unit was evaluated at 70 percent.

Table 43. Overall BMP Effectiveness

Overall Effectiveness (%)	Number of Units
98	1
95	2
90 - 95	3
90	2
85 – 90	2
88	1
80	1
70	1

2. Thirteen stands within the Kalispell timber sale were monitored for fine organic matter, coarse woody debris, and soil displacement and compaction.

Table 44. Organic Matter and Soil Displacement and Compaction Assessment

Stand Number	Organic Matter Component relative to Graham et al., 1994		Soil Displacement and Compaction
	Fine Organics % Optimum Level	Coarse Woody Debris (t/ac)	
841-4-52	100	32	None
841-3-50	90	21	10% detr. compaction
810-1-62	90	50	9% detr. compaction
841-3-102	87	22	None
841-4-27	87	34	None
810-1-63	67	19	None
839-4-19	100	55	None
810-1-61	87	31	None
810-6-65	67	14	None
839-3-13	75	71	None
839-3-11	64	70	None
839-3-8	44	35	None
838-2-28	-	49	None

a) Fine organic matter ranged between 44 and 100 percent for all units and meet the suggested minimum of 30 percent or greater.

b) The recommended range of coarse woody debris of 17 to 33 tons per acre in subalpine fir, moist western hemlock and western red-cedar habitat types was within limits in five, exceeded levels in six, and were below optimum limits in one stand.

c) None but two stands showed detrimental impacts (10 percent and 9 percent detrimental compaction). The units meet Regional and Forest Plan soil quality standards.

3. Foliar analysis for essential nutrients was undertaken on metasedimentary Belt formations on the Avery Ranger District to determine potential nutrient deficiency, specifically potassium.

   All the Douglas-fir trees sampled were deficient in nitrogen; potassium, sulfur, and boron. Douglas-fir trees on the lower Wallace formation were also deficient in phosphorus. All the grand fir trees sampled were deficient in nitrogen, phosphorus, potassium, boron, and likely copper. Critical foliar nutrient concentrations are based on laboratory studies for several conifer species in the inland northwest (Garrison and Moore, 1998).

References

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Graham R.T., A.E. Harvey, M.F. Jurgensen and others. 1994. Managing coarse woody debris in forests of the Rocky Mountains. Research paper INT-RP-477, Intermtn. Res. Stat., 14 pp.

Niehoff G.J. 2002. Soil NEPA analysis process and source of soil disturbance model coefficients. Unpublished document.

Table 45. Foliar Analysis by Species and Rock Type

St. Joe NF, Avery District, Foliar Analysis Results by Species and Rock Type (Spring 2003 Collection)

Values in RED (or italics) are below critical levels, meaning stands are likely deficient in these elements.

		Percent or pph						ppm						
Stand and Rock ID	**Species**	**N**	**P**	**K**	**MG**	**CA**	**S**	**ZN**	**MN**	**CU**	**FE**	**B**	**AL**	**NA**
YWL-280-03-017#1	DF	1.00	0.08	0.43	0.11	0.37	0.06	12	203	3	122	6	201	0.01
YWL-280-03-017#2	DF	1.24	0.16	0.49	0.16	0.33	0.09	36	298	4	89	6	191	0.01
YWL-280-03-017#4	DF	0.94	0.08	0.50	0.08	0.44	0.06	15	358	3	76	14	143	0.01
YWL-280-03-017#3	DF	1.13	0.10	0.51	0.08	0.27	0.07	17	195	6	65	12	138	0.01
YWL-280-03-017#5	DF	0.99	0.09	0.51	0.17	0.45	0.09	40	518	5	68	21	141	0.01
YSR-280-05-027#1	DF	0.89	0.15	0.47	0.11	0.48	0.09	14	420	2	77	15	304	0.01
YSR-280-05-027#2	DF	0.91	0.12	0.36	0.13	0.50	0.08	10	418	2	73	17	195	0.01
YSR-280-05-027#3	DF	0.94	0.15	0.51	0.11	0.44	0.07	15	587	3	71	15	193	0.01
YSR-280-05-027#4	DF	1.05	0.22	0.61	0.15	0.58	0.08	22	608	3	90	4	316	0.01
YSR-280-05-027#5	DF	0.95	0.18	0.48	0.13	0.52	0.08	28	369	3	90	13	272	0.01
Douglas-fir		**N**	**P**	**K**	**Mg**	**Ca**	**S**	**Zn**	**Mn**	**Cu**	**Fe**	**B**	**Al**	**Na**
Avg. Low Wallace	DF	*1.06*	*0.10*	*0.49*	0.12	0.37	*0.07*	24	314	4	84	*12*	163	0.01
Avg. St. Regis	DF	*0.95*	0.16	*0.49*	0.13	0.50	*0.08*	18	480	3	80	*13*	256	0.01
Critical Level	***DF***	***1.40***	***0.12***	***0.60***	***0.08***	***0.15***	***0.11***	***10***	***15***	***2***	***25***	***20***	**	**

Stand and Rock ID	**Species**	**N**	**P**	**K**	**MG**	**CA**	**S**	**ZN**	**MN**	**CU**	**FE**	**B**	**AL**	**NA**
YWM-232-03-025#4	GF	1.10	0.12	0.72	0.13	0.79	0.10	20	1326	2	92	11	521	0.01
YWM-232-03-025#3	GF	0.89	0.09	0.74	0.09	0.94	0.08	14	898	2	148	12	669	0.01
YWM-232-03-025#2	GF	0.87	0.15	0.93	0.15	0.77	0.10	31	1147	2	106	13	467	0.01
YWM-232-03-025#1	GF	1.04	0.16	0.95	0.17	0.93	0.11	28	1155	2	80	13	559	0.01

Grand Fir		**N**	**P**	**K**	**Mg**	**Ca**	**S**	**Zn**	**Mn**	**Cu**	**Fe**	**B**	**Al**	**Na**
Avg. Mid Wallace	GF	*0.98*	*0.13*	*0.84*	0.14	0.86	0.10	23	1132	*2*	107	*12*	554	0.01
Critical Level	***GF***	***1.15***	***0.15***	***0.90***	***0.06***	***0.12***	***0.08***	***10***	***100***	***3***	***50***	***20***	**	**

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 sensitive wildlife species, ecosystem restoration, old growth, whitebark pine, and fire.

Sensitive Wildlife Species

Bats: Abandoned mines are important habitat for at least nine bat species in North Idaho, including Townsend's big-eared bat, a sensitive species. In 2003 our surveys focused on internal mine surveys where bat biologists went into abandoned mines and looked for bats that roost there during the day. Surveys were conducted by Rick Sherwin (research biologist from the University of New Mexico), Faith Watkins (bat researcher from Bat Conservation International) and a Forest Service wildlife technician.

Bats or bat sign were found at 26 of 41 mines surveyed (66%) on the Idaho Panhandle National Forests in 2003. A Townsend's big-eared bat was found at one mine and their guano was found at two mines. All were sites where this species has been found before. None of the 26 internal surveys of mines on the national forest found bats.

These scientific name abbreviations apply to the next 2 tables:

COTO – Townsend's big-eared bat (Corynorhinus townsendii)
EPFU - big brown bat (Eptesicus fuscus)
MYEV – western long-eared bat (Myotis evotis)
MYVO – long-legged bat (Myotis volans)
MYLU – little brown bat (Myotis lucifugus)
MYsp – unknown species of genus Myotis. These species are often very difficult to identify to species.
UNK – unknown bat species (may or may not be genus Myotis)

Table 46. Mines Surveyed for Bats in 2003

	COTO	EPFU	MYCA	MYEV	MYVO	MYLU	MYsp	No bats
MINE								
American Girl	COTO guano							
Bethlehem	COTO guano							
Better Times							UNK	
Big Elk #1				X	X			
Bird Creek								X
Black Horse #1				X			X	Myotis guano
Black Horse #2								X
Black Horse #3							Myotis guano	X
Black Horse #4								X
Blue Ribbon								X
Blue Sky #1				X	X			
Blue Sky #2							X	
Blue Sky #3			X					X
Fishhook								X
Fourth of July Silver							X	
Franklin #2			X					
Franklin #3								X
Glidden Lake							Myotis guano	
Kavanaugh								X
Lakeview								guano
Lawrence #2								X
Lawrence #3								X
Paragon upper adit								X
Pend Oreille #1							UNK	
Pend Oreille #2							UNK	
Pend Oreille 3c							UNK	
Pend Oreille #6							UNK	

Table 46. Mines surveyed for bats in 2003 (continued)

	COTO	EPFU	MYCA	MYEV	MYVO	MYLU	MYsp	No bats
MINE								
Pine Creek #2	X			X			X	
Pine Creek #3								X
Red Monarch		X	X	X			Myotis guano	
Shirley			X	X	X			guano, moth wings
Silver Scott - upper adit								moth wings
Silver Scott - lower adit								X
Silver Tip #1							UNK	
Silver Tip #2							UNK	
Snowbird							UNK	
Two Mile #2				X				
Vendetta Chief - lower adit			X	X	X			possible MYTH
West Fork Moon Gulch								X
West Fork Moon Gulch #2							UNK	

Fisher: The fisher is a sensitive species on the Idaho Panhandle National Forests. Seventeen miles of winter track surveys were conducted to search for fisher tracks on the North Zone. None were found.

Flammulated Owl: The flammulated owl is a sensitive species on the Idaho Panhandle National Forests. Surveys on 2,951 acres on the North Zone got 12 responses from flammulated owls. On the Coeur d'Alene River Ranger District, surveys at three locations covering approximately 3,500 acres documented one flammulated owl calling in the Fernan Saddle area. This was only the second time a flammulated owl had been heard on the Coeur d'Alene River Ranger District during eight years of broadcast vocalization surveys for the species.

On the North Zone 1,450 acres of flammulated owl habitat was validated. Walk-through surveys examined the amount of overstory cover, understory species and snags. Results showed the Forests' flammulated owl model was underestimating the amount of capable and suitable flammulated owl habitat.

Northern Goshawk: The goshawk is a sensitive species on the Idaho Panhandle National Forest. Twenty-six known goshawk territories were monitored and six new ones found on the Idaho Panhandle National Forest in 2003; 15 of the 26 nests monitored were on the Coeur d'Alene River Ranger District. Surveys for nesting goshawks were conducted on 18,626 acres of the Idaho Panhandle National Forests; of which 12,000 of these acres were on the Coeur d'Alene River Ranger District. Across the Idaho Panhandle National Forests, at least eight nests were active and at least nine chicks fledged from five of

the goshawk nests in 2003. Most nests were not monitored to determine productivity. No response was recorded for several previously active territories on the Coeur d'Alene River Ranger District.

Common Loon: The common loon is a sensitive species on the Idaho Panhandle National Forests. In 2003, 35 miles of shoreline on Priest Lake and Upper Priest Lake were surveyed for nesting loons, but none were found.

Harlequin Duck: The harlequin duck is a sensitive species on the Idaho Panhandle National Forests. On the North Zone, pair surveys on 27 miles of streams including both Granite Creeks (Sandpoint & Priest), Gold Creek, West Gold Creek, North Gold Creek, Grouse Creek, Deer Creek (Bonners Ferry) and the Moyie River found 2 harlequin duck pairs and 2 drakes. Similar surveys on 70 miles of streams on the St. Joe Ranger District found a single harlequin duck drake but no pairs.

Brood surveys of 13.7 miles of North Zone streams including Gold Creek and East Fork of Lightning Creek found 1 harlequin duck hen and seven juveniles. Brood surveys of 31.1 miles of streams on the St Joe Ranger District found no harlequin ducks.

Pair surveys were conducted on one mile of shoreline on Fernan Lake, 3.5 miles of Teepee Creek and 1.5 miles of Big Elk Creek on the Coeur d'Alene District. No harlequin ducks were recorded.

Three harlequin duck hens were also found on Granite Creek on the Priest Lake Ranger District, and three juveniles were seen outside the survey period.

Table 47. Harlequin Duck Survey Results

Survey Area	District	Pair Survey	Brood Survey
Deer Creek	Bonners Ferry		
Gold Creek	Sandpoint	2 pairs	2 hens + 7 juveniles
East Fork Lightning Creek	Sandpoint		1 hen + 2 juveniles
St. Joe River between Spruce Creek and Conrad Campgrounds	St. Joe	1 drake	
Tepee Creek	Coeur d'Alene		
Big Elk Creek	Coeur d'Alene		
Fernan Lake	Coeur d'Alene		

Black-backed woodpecker: The black-backed woodpecker is a sensitive species on the Idaho Panhandle National Forests. Drumming surveys on the Coeur d'Alene River Ranger District were completed again in fiscal year 2003 through a Challenge Cost Share agreement with the Coeur d'Alene Audubon Society. Survey locations and results are shown below. No black-backed woodpecker surveys were conducted on the North Zone or South Zone.

Table 48. Black-backed and Pileated Woodpecker Survey Results

Location	District	Black-backed woodpeckers	Pileated woodpeckers
Buckles Mountain	Coeur d'Alene River		1 pair
Beauty Creek	Coeur d'Alene River	1 pair	1
Cottonwood Creek	Coeur d'Alene River		2
Crooked Ridge	Coeur d'Alene River	1	
Magee	Coeur d'Alene River	1	1
TOTAL		**4**	

Boreal Toad: The boreal toad is a sensitive species on the Idaho Panhandle National Forests. Twenty-five acres (seven sites) of amphibian habitat were surveyed for boreal toads. No toads were found.

Snags: Snags were surveyed on 1,072 acres on three timber sale areas on the North Zone. None of the harvested units in the Four Corners Timber Sale met forest plan standards for snags. In the Dusty Peak Timber Sale, approximately 200 acres didn't meet the forest plan standards, but the other units did. On the Coeur d'Alene River Ranger District, approximately 3,000 acres within five timber sale areas were surveyed for snag retention. Of the units surveyed, only 5 acres of those monitored on the district didn't meet snag guidelines following burning.

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, 1992-2003

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 2,659 acres were planted to these species in 2003. (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 1992-2003 there were 64,763 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 2002 the IPNF planted approximately 341,163 rust resistant white pine seedlings.
- From 1992 through 2003 the Forest planted over 11,317,892 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 2003, the Idaho Panhandle National Forests pruned approximately 3,682 acres where pine is a major portion of the forest.
- From fiscal year 1992 through 2003, the Forest has pruned about 22,068 acres.

The implementation of the guidelines also ensures that even where we are harvesting trees, we will maintain a naturally breeding white pine population that has a high probability of capturing the available blister rust resistant genes. We began using these guidelines where we harvest trees in 1996.

3) Managing tree stocking and forest structure

- 3,374 acres were thinned or released in fiscal year 2003. 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 1992-2003, 73,651 acres were thinned or released.

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

- There were 2,613 acres of harvest related natural fuel reduction.
- There were 6,375 acres of natural fuel reduction.

5) Watershed Improvement

- 676 acres of watershed improvement were accomplished in fiscal year 2003.

- From fiscal year 1992 to 2003 there were 9,847 acres of watershed improvement.

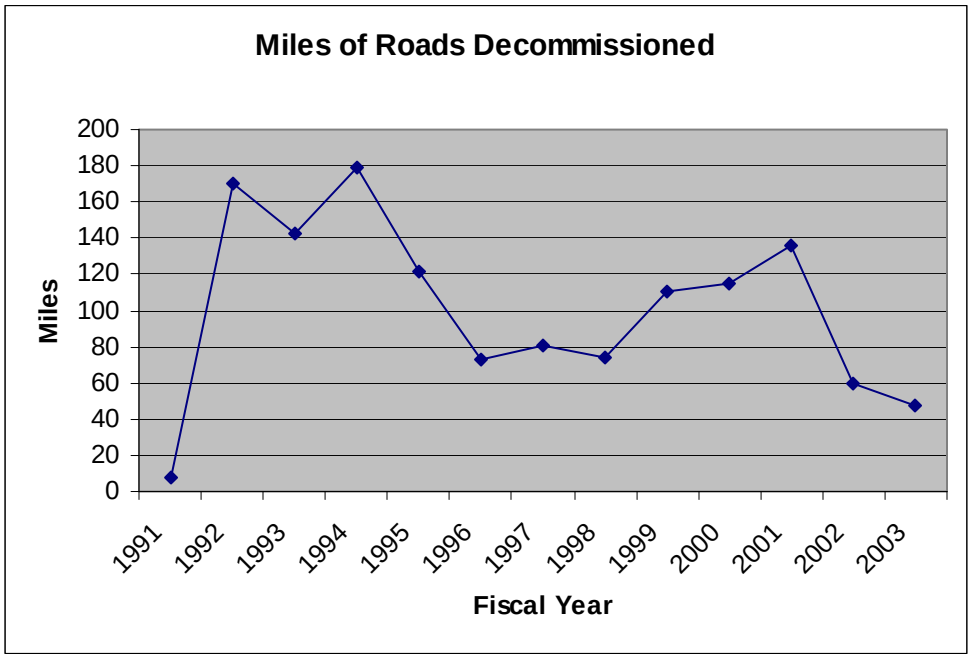
6) Road decommissioning

- There were 47.2 miles of road decommissioned in fiscal year 2003 as part of ecosystem restoration work, using a variety of funds.
- The following table shows that there were 1,317.1 miles of road decommissioning on the Idaho Panhandle National Forests from fiscal year 1991 to 2003. Classified roads are generally the ones that are inventoried, maintained and managed by the forest. The unclassified roads are not.

Table 49. 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
TOTAL	**995.3**	**321.8**	**1,317.1**

Figure 8. 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 Forests, Forest Plan, Standard 10b calls for maintaining "10% of the forested portion of the Idaho Panhandle National Forests as old growth". The forest plan identified 2,310,000 forested acres on the Idaho Panhandle National Forests. Therefore, the forest plan standard requires maintaining 231,000 acres of old growth on the forest. 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 9/04). Old Growth Forest Types of the Northern Region. USDA, Forest Service, Northern Region.*

From 1990 through 1993 the Idaho Panhandle National Forests did an intensive inventory of old growth resources, and worked with local public Forest Watch groups to identify and map old growth. Since that time, we have continued to update our old growth inventory as the forest was changed by natural events, and as new data became available. This ongoing monitoring and updating of old growth inventory results in some changes in old growth acres reported in monitoring reports over the years, in response to changing conditions on the ground. Each year's monitoring report includes the most current information available for that year. The information below was extracted from our database in March 2004, and represents the approximate situation at the end of 2003.

Starting in 2001 and continuing for several years the Idaho Panhandle National Forests is undertaking a comprehensive review of old growth data, and doing some new field reviews and stand exams, to be sure our database is doing the best job possible of depicting current conditions on the ground. We don't expect major changes, but we are continually striving to increase the quality of our information about this important forest ecosystem component. As a result of this ongoing review, there are a few changes in this report's old growth totals as compared to the previous years. Results from this ongoing comprehensive review are being incorporated into our databases on an annual basis.

The Idaho Panhandle National Forests 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 Idaho Panhandle National Forests has approximately 600,000 acres of mature forest (generally 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 data in response to changing conditions on the ground, and as we obtain new information.

The Idaho Panhandle National Forests 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. To keep our old growth inventory as up-to-date as possible, we not only do periodic forest-wide reviews and updates (as explained above), but we also take a closer look whenever any management activity is being considered that could possibly impact old growth. Within a project area, we review and verify the old growth allocation, as well as all potential treatment stands. 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 impacting old growth stands. Project design also includes consideration of the potential for future old growth in the area.

In 2004 the Forest Service "Forest Inventory and Analysis" (FIA) program is expected to complete its inventory of the Idaho Panhandle National Forests. FIA is a national, statistically designed inventory of forest conditions, installed and maintained by Forest Service Research. When the FIA data becomes

available, we will use it as an independent verification of the amount of old growth across this national forest.

The old growth definitions in *Green and others* are in two parts. First, there are tables of "Old Growth Type Characteristics". In these tables there are "minimum criteria" (minimum age, tree diameter, number of large trees, and basal area) and "associated characteristics" (ranges and probabilities of percent broken topped trees, decay, snags, diameter distribution, large down wood, and number of canopy layers). Second, pages 11 and 12 of *Green and others* explains how to use these tables. It's explained that: "minimum criteria in the 'tables of old growth type characteristics' are meant to be used as a screening device to select stands that may be suitable for management as old growth, and the associated characteristics are meant to be used as a guideline to evaluate initially selected stands." The "associated characteristics" are the means of values found in the data set evaluated in *Green and others*. There was so much variability in associated characteristics that *Green and others* did <u>not</u> find them useful even as a screening device for old growth. Therefore, *Green and others* warns that: "A stand should not be accepted or rejected as old growth simply on the basis of associated characteristics." Speaking of the minimum criteria, *Green and others* 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. . . . Most stands that meet minimum criteria will be suitable old growth, but . . . some old growth may be overlooked. Do not accept or reject a stand as old growth based on the numbers alone; use the numbers as a guide." *Green and others* then goes on to provide some guidance for incorporation of landscape considerations, and a full range of resource values (including human values) in the final selection of lands to be managed as old growth. The overall message is that old growth cannot be absolutely defined in black and white by some specific set of numbers; professional consideration of a wide and complex variety of factors is necessary to make determinations for old growth allocation.

Using the guidance in *Green and others*, we have inventoried and identified old growth stands on the Idaho Panhandle National Forests. We record old growth status in the Forest Service Northern Region Timber Stand Management Record System (TSMRS) database, because there are database fields and codes dedicated to old growth. Over the years there have been some changes in old growth code definitions in the Regional TSMRS database, and part of the objective of the comprehensive review we're in the midst of is to make sure that all our old growth stands are coded correctly in terms of the current definitions. Any database is simply an electronic box with pre-defined fields to store specific types of information. It is not possible to make meaningful sweeping general statements about the reliability of a widely used database. The reliability of any specific information item in any database depends upon the local effort devoted to gathering and maintaining that specific information item. In the last three years the Idaho Panhandle National Forests has spent over $300,000 reviewing and updating our old growth information in TSMRS, and that effort is ongoing.

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

"Existing Old Growth" meets (and usually exceeds) Northern Region old growth minimum criteria at the stand level. The "Ancient Cedar" category is also part of our existing allocated old growth, but we track it separately because we want to take special note and care of these unique stands. "Ancient Cedar" stands contain some trees over 5 feet in diameter and generally over 500 years old; they far exceed minimum old growth criteria.

"Potential Old Growth" meets, or comes very close to meeting most old growth stand minimum criteria, but is lacking somewhat in some criteria. However, it does contribute to old growth functions. The most common situation is that the "potential old growth" has more than enough large trees to meet old growth criteria, but some of the trees are not quite old enough. However, these are usually the largest and oldest trees we have in a given area, and with time can be expected to meet the age criteria as well. Some "potential old growth" is included in our old growth allocation because it is close to meeting the minimum criteria, is the best that we have available in an area, and the distribution of old growth across the landscape is important. Other allocated "potential old growth" stands are small patches that contribute to the integrity of a larger block of allocated 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 (1992)* about the importance of using landscape ecology considerations, as well as individual stand attributes, in selecting land to be allocated as old growth.

Old growth totals are presented in Table 50. 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 275,200 acres (11.9 percent of forested acres) to be retained as old growth. We also have an additional 7,442 acres (0.3 percent of forested acres) of field verified unallocated old growth, which provides old growth habitat for wildlife and serves other ecological functions. Not showing in the table below are an additional 6,665 acres that have been aerial photo identified as possible old growth, but have not yet been field checked.

Table 50. Acres of Old Growth By River Sub-Basin

Sub-Basin (River)	Allocated Existing Old Growth *(Codes 9, 10)*	Allocated Ancient Cedar *(Code 2)*	Allocated Potential Old Growth *(Code 11)*	Total Allocated Old Growth *(Codes 2, 9, 10, 11)*	Additional Field Verified Old Growth *(Code 12)*	Total All Old Growth *(Codes 2, 9, 10, 11, 12)*
St. Joe	59,995	1,946	13,114	**75,055**	7,407	**82,462**
Coeur d'Alene	56,037	18	8,867	**64,922**	0	**64,922**
Pend Oreille	19,708	63	4,929	**24,700**	0	**24,700**
Kootenai	60,224	516	3,507	**64,247**	0	**64,247**
Priest	43,693	1,169	1,414	**46,276**	35	**46,311**
Forest Total	**239,657**	**3,712**	**31,831**	**275,200**	**7,442**	**282,642**

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

Table 51. Acres of Allocated Old Growth Compared to Management Area Goal

Management Area	Management Area goal: "Maintain approximately *xxxxx* acres"	Allocated Old Growth acres
1	25,000	106,178
2	6,000	21,996
3	400	1,920
4	4,000	13,903

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

Table 52. Old Growth Habitat Type Series Distribution

Habitat Type Series	% Inventoried IPNF Acres by Habitat Type Series	% of Allocated Old Growth by Habitat Type Series
Ponderosa Pine	< 0.1%	0.0%
Douglas Fir	6.8%	2.5%
Grand Fir	14.7%	5.2%
Western Red Cedar	16.1%	18.6%
Western Hemlock	37.7%	40.0%
Subalpine Fir	15.0%	18.6%
Mountain Hemlock	9.7%	15.1%
Lodgepole Pine	< 0.1%	0.0%

As displayed above, old growth on the Idaho Panhandle National Forests does reflect approximately the habitat type series distribution of the forest. On 78.5 percent 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 21.5 percent 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 percent of Idaho Panhandle National Forests land. The moist end of the grand fir series (which is still drier than the rest of the forest) covers another 11.5 percent of Idaho Panhandle National Forests land, and is often found at lower elevations and southerly aspects adjacent to the dry types, and is subject to significant moisture stress during drought years.

The huge, severe 1910 burn and other big early 20th century fires, subsequent suppression of all low severity fires, early 20th century timber cutting, root diseases, and bark beetles have all contributed to the low proportion of old growth in these two habitat type series. Much of the old growth inventoried on these two habitat type series is currently dominated by Douglas-fir, which is 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 sites is at risk from *Scolytus* bark beetles. The discussion below explores the importance of active management in sustaining and increasing the proportion of old growth on dry habitat types.

Although most of the Idaho Panhandle National Forests is a moist forest environment, we do have some low elevation areas with dry forest habitat types (ponderosa pine and Douglas-fir habitat types, and the

drier grand fir habitat types). Although these dry areas represent only about 10 percent of our forested acres, they are quite important in terms of the potential forest structures and plant and animal species they can support. The natural processes that maintained old growth on dry sites were very different than on moister sites. Historically, most of these dry forest habitat types were subject to frequent low-severity underburns 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 frequent low-severity fires were the keystone natural process that maintained dry site old growth forest structures.

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

On these dry sites, hands-off management of existing overly dense mature and immature fir-dominated stands in their current state is not likely to increase the amount of future old growth. Active restoration by mimicking of historic disturbance processes may be necessary to meet the Forest Plan standard of 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 evaluate restoration opportunities. Restoration may include various mixes of prescribed fire, thinning, and planting of historic shade-intolerant, fire-adapted tree species. The large old trees will 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 is lacking, similar restoration activities may be necessary to create forests that are more likely to survive long enough to become old growth.

Whitebark Pine

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

Whitebark pine is a shade-intolerant tree species that requires canopy openings for regeneration. The Clark's nutcracker is the primary seed-dispersing agent for whitebark pine. This bird extracts seeds from whitebark pine cones and caches them in the ground -- often in open areas. If the opening is large enough, some of these seeds can germinate and potentially grow to mature whitebark pine. Burned areas provide an ideal opportunity for this regeneration. If there is a whitebark pine seed source, Clark's nutcrackers can provide effective seed dispersal at distances of well over a mile from the nearest seed trees. (Information about Clark's nutcracker from: Diana F. Tomback, "Clark's Nutcracker: Agent of Regeneration" in Whitebark Pine Communities: Ecology and Restoration; D. F. Tomback, S. F. Arno, and R. E. Keane, eds.; Island Press. 2001.)

Although whitebark pine is not highly resistant to fire, it is somewhat more fire resistant than either spruce or subalpine fir. Low and mixed severity fires likely give whitebark some advantage over those other species. After large stand replacing fires, long distance seed dispersal by Clark's nutcrackers gives whitebark pine a regeneration advantage over other wind-dispersed conifers. Where whitebark pine grows in combination with spruce and fir, if there is no significant canopy-opening disturbance over a long time, whitebark pine will eventually be replaced by more shade-tolerant species -- predominantly subalpine fir with minor amounts of spruce. In these mixed species stands, fire is essential to maintain whitebark pine. At higher elevations, fire also enhances whitebark pine regeneration.

Whitebark pine is very sensitive to the introduced disease, white pine blister rust, which is now significantly and continuously reducing the whitebark population. On mature whitebark pine, blister rust kills branches and tops of the trees first, reducing or eliminating their seed producing potential long before killing the whole tree.

Whitebark pine is also subject to natural periodic mountain pine beetle outbreaks that kill many trees. Historically, prior to the introduction of blister rust, periodic summer forest fires provided opportunities for whitebark pine to regenerate after mountain pine beetle had reduced its population. Now, populations (and seed production potential) of whitebark pine are already significantly reduced by blister rust. After mountain pine beetle goes through these weakened stands, there are fewer seed-producing whitebark pine left. And, fire suppression means fewer opportunities for large-scale regeneration of whitebark pine after beetle outbreaks. When blister rust mortality, the effects of fire suppression, and the impact of mountain pine beetle come together, whitebark pine can be practically eliminated from some mountain ridge systems. This pattern of loss is exactly what appears to be happening in high elevation areas across much of the Idaho Panhandle. This is part of a range-wide decline of whitebark pine that is attracting the concern of forest ecologists throughout western North America.

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

The following information, data, and graphs about mountain pine beetle in whitebark pine in the Selkirk Mountains come from the following three sources:

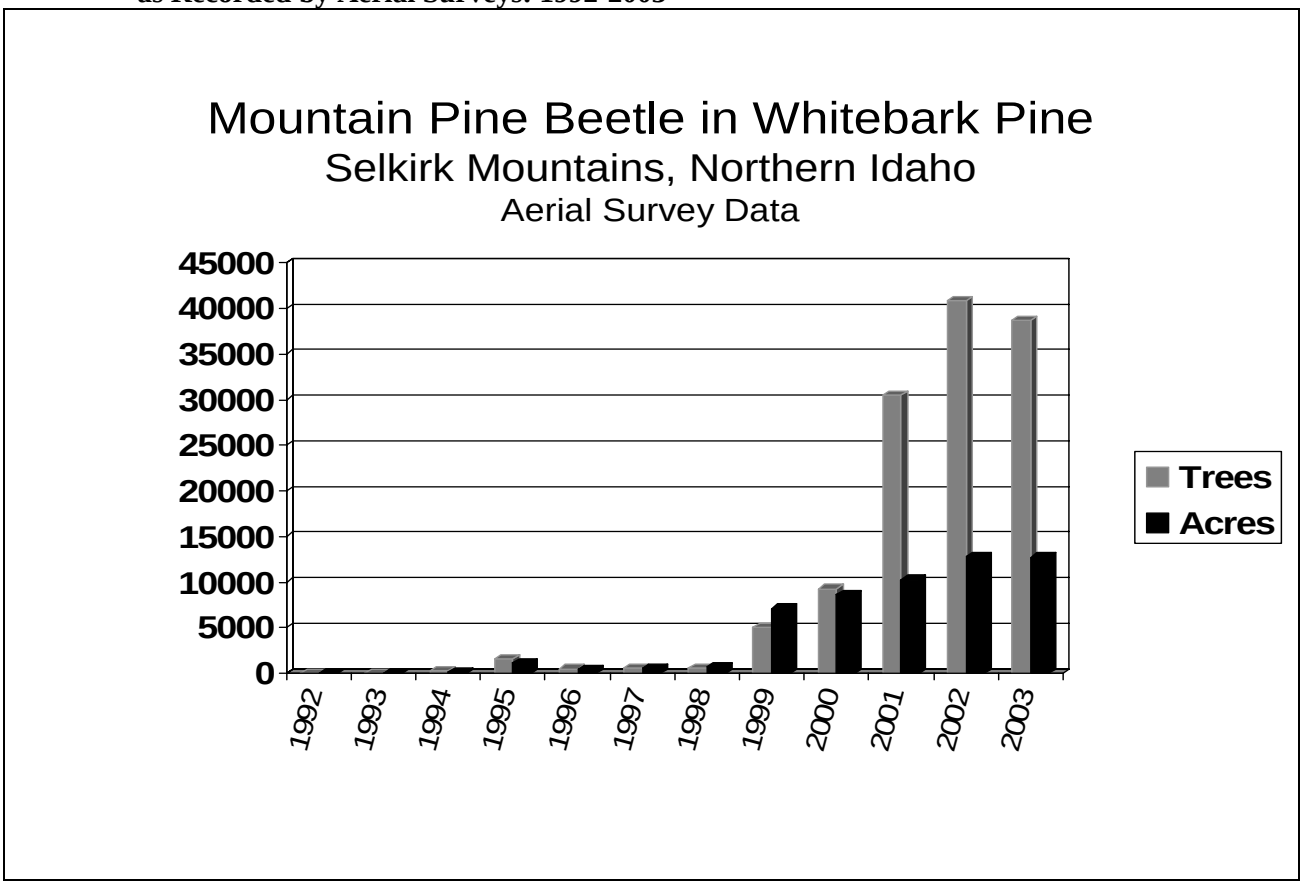
1) Sandra Kegley, John Schwandt, and Ken Gibson. February 2004. Forest Health Assessment of Whitebark Pine in Selected Stands in the Selkirk Mountains of Northern Idaho 2001. Forest Health Protection Report 04-5. USDA Forest Service, Northern Region. Missoula, MT. 8p.
2) John Schwandt and Sandra Kegley. April 2004. Mountain Pine Beetle, Blister Rust, and Their Interaction On Whitebark Pine At Trout Lake and Fisher Peak in Northern Idaho From 2001-2003. Forest Health Protection Report 04-9. Forest Health Protection Report 04-5. USDA Forest Service, Northern Region. Missoula, MT. 6p.
3) Sandy Kegley – personal communication.

The work being done by the Forest Service, Northern Region, Forest Health Protection personnel is invaluable for understanding what's happening to whitebark pine in the northern Idaho, particularly in regards to the current mountain pine beetle outbreak.

Aerial surveys in late summer of 1999 discovered a major mountain pine beetle outbreak in the northern Selkirk Mountains whitebark pine. Subsequent monitoring has shown that this beetle outbreak has expanded dramatically in both extent and severity. During the summers of 2000 and 2001 Forest Service Forest Health Protection crews did bark beetle ground-survey work in the northern Selkirks, and found that the mountain pine beetle outbreak was very large, still growing, and killing a high percentage of the mature whitebark pine trees in some areas. Fieldwork in 2002 and 2003 showed that areas, which in 2001 only had light mortality from mountain pine beetle are now experiencing substantially heavier mortality.

The following graph provides aerial survey data on how the mountain pine beetle outbreak in the northern Selkirks has grown. In interpreting this graph, be aware that it's based on aerial survey counts and mapping of trees killed by mountain pine beetle. In most cases, trees attacked and killed one year don't turn red until the following summer, and thus aren't visible from the air until the following summer. For this reason, these data do not represent current year mortality. The 2003 aerial survey data shows that the increase in acreage affected and numbers of trees killed appears to have leveled off, but remains at very high outbreak levels.

Figure 9. Whitebark Pine: Dead Trees and Infested Acres Due to MPB in the Selkirk Mountains, as Recorded by Aerial Surveys: 1992-2003



The following are data from Forest Health Protection Report 04-5 (referenced above), documenting 2001 ground surveys of mountain pine beetle on whitebark pine in the Selkirks.

Table 53. Mountain Pine Beetle and Blister Rust Mortality in Whitebark Pine in the Northern Selkirk Mountains

Location	Cutoff Peak	Fisher Peak	Trout Lake	Farnham Ridge	East Russell Ridge
# WBP examined	202	139	200	35	121
WBP alive	118 (58%)	99 (71%)	167 (84%)	8 (23%)	8(7%)
Year 2001 MPB attack	21 (10%)	17 (12%)	11 (6%)	3 (9%)	26 (21%)
Year 2000 MPB attack	32 (16%)	14 (10%)	4 (2%)	2 (6%)	51 (42%)
Older MPB attack	24 (12%)	6 (4%)	13 (7%)	19 (26%)	30 (25%)
Unknown or secondary mortality	7 (3%)	3 (4%)	5 (3%)	3 (9%)	6 (5%)
Total Dead	84 **(38%)**	40 **(29%)**	33 **(17%)**	27 **(77%)**	107 **(93%)**
WBP killed by MPB in last 2 years	53 **(26%)**	31 **(22%)**	15 **(8%)**	5 **(14%)**	77 **(64%)**
WBP infected with BR	145 (72%)	90 (65%)	134 (67%)	20 (57%)	73 (60%)

Results varied between different locations. By 2001, depending upon location, from eight percent to as much as 64 percent of the whitebark pine in the survey areas had been killed by mountain pine beetle during the previous two years. From 17 percent to as much as 93 percent of the whitebark pine were dead, depending upon area. By 2001, out of all the trees sampled, mountain pine beetle had killed 26 percent within the previous two years, and 42 percent of all whitebark pine trees sampled were dead. These numbers do not count either mortality represented by very old snags, or years 2002 - 2003 mortality. Where there were still trees alive, whitebark pine mortality from both mountain pine beetle and blister was expected to continue over the next few years.

In 2003 Forest Service Forest Service Health Protection personnel revisited two areas examined in 2001, and installed new, independent random strip surveys. Results of these new surveys are shown in the table below. In 2001 Fisher Peak and Trout Lake had only low to moderate levels of mountain pine beetle mortality. By 2003 the percent of whitebark pine killed by mountain pine beetle had doubled at Fisher Peak and more than tripled at Trout Lake. Between mountain pine beetle and blister rust mortality, only 44 percent of the sampled whitebark pine trees remained alive at Fisher Peak, and only 52 percent of the whitebark pine remained alive at Trout Lake. Details of these two surveys are shown in the table below.

Table 54. Whitebark Pine with Mountain Pine Beetle (MPB) or Blister Rust Infection by Area and Year*

Location	Fisher Peak 2001	Fisher Peak 2003	Trout Lake 2001	Trout Lake 2003
# WBP examined	139	200	200	198
WBP alive	99 **(71%)**	88 **(44%)**	167 **(84%)**	103 **(52%)**
Year 2003 MPB mass attack	NA	42 (21%)	NA	21 (11%)
Year 2002 MPB mass attack	NA	36 (18%)	NA	54 (27%)
Older MPB mass attack	NA	30 (15%)	NA	13 (7%)
Total killed by MPB	37 **(27%)**	108 **(54%)**	28 **(14%)**	88 **(44%)**
WBP infected with Blister Rust	90 (65%)	133 (67%)	134 (67%)	143 (79%)

*Blister rust infection was determined from the ground with binoculars

The strip surveys above sampled mature trees. Mountain pine beetle does not usually attack seedling and sapling size trees. Tallies in the smaller regeneration size trees showed about half infected with blister rust. Part of this lower infection rate in younger trees is undoubtedly due to a more limited exposure time than the mature trees. But, there is likely also some level of blister rust resistance in some of the regeneration size whitebark pine, as well as a few of the remaining mature trees. The more blister rust-resistant younger age class, and the mature whitebark pine that have survived exposure to blister rust, provide a population to work with for whitebark pine restoration efforts.

At these two locations, with the change from relatively low mountain pine beetle populations in 2001 to the much higher beetle populations in 2003, there seems to be a change in feeding preferences. With low beetle populations, the beetles appeared to focus on that whitebark pine already weakened by blister rust. However, with high beetle populations, the blister rust infected trees are no longer preferred, and there may even be some beetle preference (noted, but not statistically significant) for apparently healthy trees. (When beetle populations are high enough, they are more likely to be successful in overwhelming the natural defenses of otherwise healthy trees). This means that once mountain pine beetle populations become high enough, there is an elevated threat to precisely those blister rust-resistant trees that are most useful as a whitebark pine restoration seed source.

Unusually warm and dry conditions the past few years may be implicated in the extent and severity of the current mountain pine beetle outbreak in whitebark pine. Warmer temperatures into the late fall and winter may be especially important. There is no obvious sign of a change in this weather pattern.

We are very concerned about the future of whitebark pine. We already have high rates of infection from blister rust. Mountain pine beetle has now killed a substantial number of the mature trees that survived blister rust, and the beetle outbreak is continuing at high levels. When the beetle populations are high, they are likely a disproportionate impact on those trees least impacted by blister rust. The pattern we're seeing here looks similar to what previously happened in other areas of the Forest (parts of the Salmo-Priest divide, and east side of the Mallard Larkins) where the combination of blister rust and mountain pine has killed the overwhelming majority of the whitebark pine, and appears to have largely removed it as a functioning component of the ecosystem in those areas.

Because of our concern about the decline of whitebark pine, the Bonners Ferry Ranger District is completing an Environmental Assessment, analyzing options for restoring whitebark pine in parts of the northern Selkirks through the use of release cutting and prescribed fire. That assessment is expected to be completed in 2004, and whitebark pine restoration work could begin in late 2004 or early 2005.

Fire and Human Disturbances

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

Fire was the dominant disturbance force shaping the historic natural forest. There was a combination of mixed severity and stand replacing fires. Stand replacing fires kill most of the stand and favor regeneration by shade-intolerant tree species. Sometimes they can cover very large areas. Mixed severity fires have varying effects on the canopy, both lethal and non-lethal, and produce irregular, patchy mosaics. Mixed severity fires and the patches they create can vary greatly in size. In general, mixed severity fire tends to favor the more fire resistant trees, and reduce stand density. Mixed severity fires were the most frequent fire type. Low severity fires cause little mortality in mature trees of the more fire resistant species, but usually burn along the ground's surface, clearing out small understory trees (especially of the more-shade-tolerant species), and reduce both live ladder fuels and dead woody fuels on the forest floor.

Before the arrival of Europeans, the moist mid elevation hillsides of the Idaho Panhandle National Forests were covered with mixed conifer forests. Western white pine comprised from 30 to 45 percent of the forest, with western larch, ponderosa pine, and Douglas-fir as the other most common trees. These tree species are adapted to both wildfire and droughts, and these forest types were largely created and maintained by forest fires. However, Douglas-fir tended to be relatively short-lived. Grand fir, hemlock, and cedar were also present, but these species are more fire and drought sensitive, and consequently were less common except in very moist micro-sites. Sites along rivers and in stream-side zones burned less frequently and less severely, and were commonly dominated by large old growth western red cedar with some old hemlock and grand fir.

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

Over the past 70 years, as a result of the introduction of white pine blister rust (in the early part of the 20th century), fire suppression, and past timber harvest practices, the Idaho Panhandle National Forests has seen major changes in forest tree species composition and structure. Blister rust has been one of the most significant factors. This introduced disease contributed to the loss of over 90 percent of the formerly dominant white pine, creates risks to the continued local persistence of whitebark pine, and has pushed forest succession toward fir and hemlock forests.

Fire suppression has also changed the landscape. The Coeur d'Alene Fire History Study (analyzed the period 1540 to 1992) found the historic mean fire return interval for stand replacing fires was approximately 190 years, and a mean return interval for all fires was 80 years (mixed severity fire most common, and some low-severity surface fire also occurred). If we extrapolate this fire history study to the 2.5 million acres of the Idaho Panhandle National Forests, an average historic fire year would have burned approximately 31,000 acres. Of these average historic annual burned acres, approximately 13,000

acres would have been stand-replacing fires, and 18,000 acres would have been low and mixed severity fires. These were long-term averages, and the actual amount of fire in any given year tended to vary greatly. However, most years saw fire over substantially more acres than we're seeing now.

Table 55 shows wildfire occurrence data for the Idaho Panhandle National Forests. These data are compared to what might be expected historically by extrapolating from the Coeur d'Alene Fire History Study. For 1969 through 2003 the total number of fires per year ranged from 44 in 1993 to 586 in 1994. We averaged approximately 160 fires per year; 70 percent of these (avg. 113 per year) were lightning-caused. During this same 35-year period the total number of acres burned per year varied from four acres in 1993 to 3,973 acres in 2003. *(This can be compared to the Coeur d'Alene Fire History Study that shows that just in the Coeur d'Alene River Basin there was a major fire event -- greater than 28,000 acres -- an average of once every 19 years.)* In the last 35 years, wildfires on the IPNF have burned an average of 772 acres per year; this is about 2.5 percent of what would have been generated as a long-term running average by historic natural fire.

Wildfires are now largely suppressed by humans (especially low and mixed severity fires). In 2003, the Idaho Panhandle National Forests responded to 129 wildfires that were suppressed after burning 3,973 acres. The 3,500-acre Myrtle Creek fire near Bonners Ferry in 2003 was the largest wildfire on the Idaho Panhandle National Forests since 1967. In 2003, 84 percent of the fire starts were natural (lightning caused), but 89 percent of the acres burned were in human caused fires. We also disposed of brush and slash from timber harvest activities on 2,613 acres, and natural fuels from 6,375 acres. Of the 2003 natural fuel abatement, 1,358 acres were actually prescribed burns.

In the last 35 years (1969 – 2003), the Idaho Panhandle National Forests has responded to 5,617 wildfires, which burned a cumulative total of 27,036 acres. Our last major stand replacing wildfire occurred in 1967. Without human suppression, over a historically typical 35-year period, wildfires, on average, might have burned 1,085,000 acres (although only 455,000 would have been stand replacing fires).

Table 55. Fire Occurrence

FISCAL YEAR	Lightning Fires	Person Fires	TOTAL FIRES	Lightning Acres	Person Acres	TOTAL ACRES
1969	37	71	108	96	171	267
1970	267	61	328	51	3,170	3,221
1971	105	46	151	49	112	161
1972	148	33	181	7	117	124
1973	69	86	155	13	1,526	1,539
1974	158	120	278	183	1,735	1,918
1975	58	43	101	9	70	79
1976	59	47	106	2	84	86
1977	188	79	267	23	67	90
1978	40	31	71	5	47	52
1979	201	120	321	110	2,585	2,695
1980	52	23	75	10	12	22
1981	94	48	142	10	14	24
1982	91	49	140	13	20	33
1983	24	35	59	0	374	374
1984	182	72	254	33	16	49
1985	93	44	137	771	12	783
1986	125	46	171	31	852	883
1987	56	70	126	11	274	285
1988	58	57	115	316	706	1,022
1989	99	39	138	92	86	178
1990	48	49	97	5	140	145
1991	76	46	122	11	2,530	2,541
1992	106	31	137	20	397	417
1993	23	21	44	1	3	4
1994	530	56	586	2,417	74	2,491
1995	56	31	87	8	15	23
1996	87	30	117	30	290	320
1997	66	12	78	11	6	17
1998	166	32	198	60	2	62
1999	127	34	161	20	67	87
2000	27	184	157	2,756	6	2,762
2001	120	21	141	236	18	254
2002	84	28	112	26	29	55
2003	108	21	129	421	3,551	3,972
Total	**3,958**	**1,659**	**5,617**	**7,857**	**19,178**	**27,035**

Wildfire vs. Human Disturbance

With the suppression of wildfire the primary vegetation disturbance agents shaping the landscape are timber harvest, prescribed burning, insects, and forest pathogens. In terms of converting vegetation to an early successional condition, regeneration timber harvest (shelterwood, seed tree, and clearcut) imitates some of the effects of stand replacing fire. Selection, salvage, and intermediate harvests imitate some of

the effects of mixed severity fires. However, (with the exception of commercial thinning) many selection, salvage, and intermediate timber harvests tend to favor shade-tolerant, fire-intolerant species much more than historic mixed severity fire did. Therefore, those partial cut timber harvests are only a partial surrogate for the effects of historic mixed severity fire.

Over the last 35 years, wildfires on the Idaho Panhandle National Forests have burned an average of 772 acres per year; this is about 2.5 percent of what would have been generated as a long-term annual average by historic natural fire. If we assume that 90 percent of this was stand replacing fire (a high assumption), that means an average of 695 acres per year of stand replacing fire. This is 5.3 percent of what historically would have been expected in average annual stand replacing fire.

Recently, federal land management agencies have become increasingly aware of some of the negative impacts of total fire suppression, and have begun activities designed to reduce fuels accumulations and restore the beneficial effects of fire. Over the last five years on the Idaho Panhandle National Forests the natural fuels abatement program has averaged 2,472 acres/year of prescribed burns (not associated with timber harvest). If we assume all of this is stand-replacing fire, that's equivalent to 19% of historic average annual fire levels.

Timber harvest amounts and types have changed significantly over the last 20 years (see Table 41 and Figures 10 and 11). During the period 1984 – 1993 the Idaho Panhandle National Forests averaged 12,554 acres per year of timber harvest; 40 percent of those harvest acres were by clearcut. Since that time there has been a rapid and sustained decline both in total acres of timber harvest, and in the percent of that harvest that is by clearcut. Because this change has been so rapid, the last five years of completed harvests best represent the current program. *(Because all figures have been reduced to annual averages, we can compare different length time periods)*. During the most recent 5-year period (1999 through 2003) the IPNF averaged 5,657 acres/year of timber harvest; only 2 percent of that was clearcut. The last five-year average acres/year of timber harvest (all types) is only 18.2 percent of the historic number of acres that burned (all severities) in an average year. What these numbers alone don't show, is that even within a given silvicultural system, treatments today are much lighter on the land than historically. Most regeneration harvests today retain more live reserve trees, snags, and large down wood than was typical a couple of decades ago.

Over this same recent five-year period, only 27 percent of the timber harvest was regeneration harvest (2 percent clearcuts; 25 percent shelterwood and seed tree cuts); the rest were commercial thinning and various sorts of partial cuts (see Figure 11). This 1,541 acres/year of regeneration harvest is only 11.9 percent of average annual area that would have been burned in historic stand replacing fires.

Table 56. Changes in Timber Harvest Amounts and Silvicultural Systems

TIME PERIOD	CLEARCUT		SHELTERWOOD / SEED TREE		SELECTION		SALVAGE		COMM THIN / INTERMEDIATE		TOTAL
	Avg Acres/Yr	% of total	Avg Acres/Yr	% of total	Avg Acres/Yr	% of total	Avg Acres/Yr	% of total	Avg Acres/Yr	% of total	Avg. Acres/Yr
1974-1983	2,798	21 %	2,825	22%	867	7%	4,254	33 %	2,274	17%	13,017
1984-1993	5,065	40 %	2,440	19%	373	3%	2,737	22 %	1,940	15%	12,554
1994-2003	533	8%	1,509	23%	573	9%	2,658	40 %	1,410	21%	6,683
1999-2003	138	2%	1,403	25%	596	11 %	1,831	32 %	1,690	30%	5,657

**To avoid double-counting acres, table does not include SW/ST Removal Cuts that are 2nd entry into the same stand*

Figure 10. Timber Harvest Trends Over Recent Decades

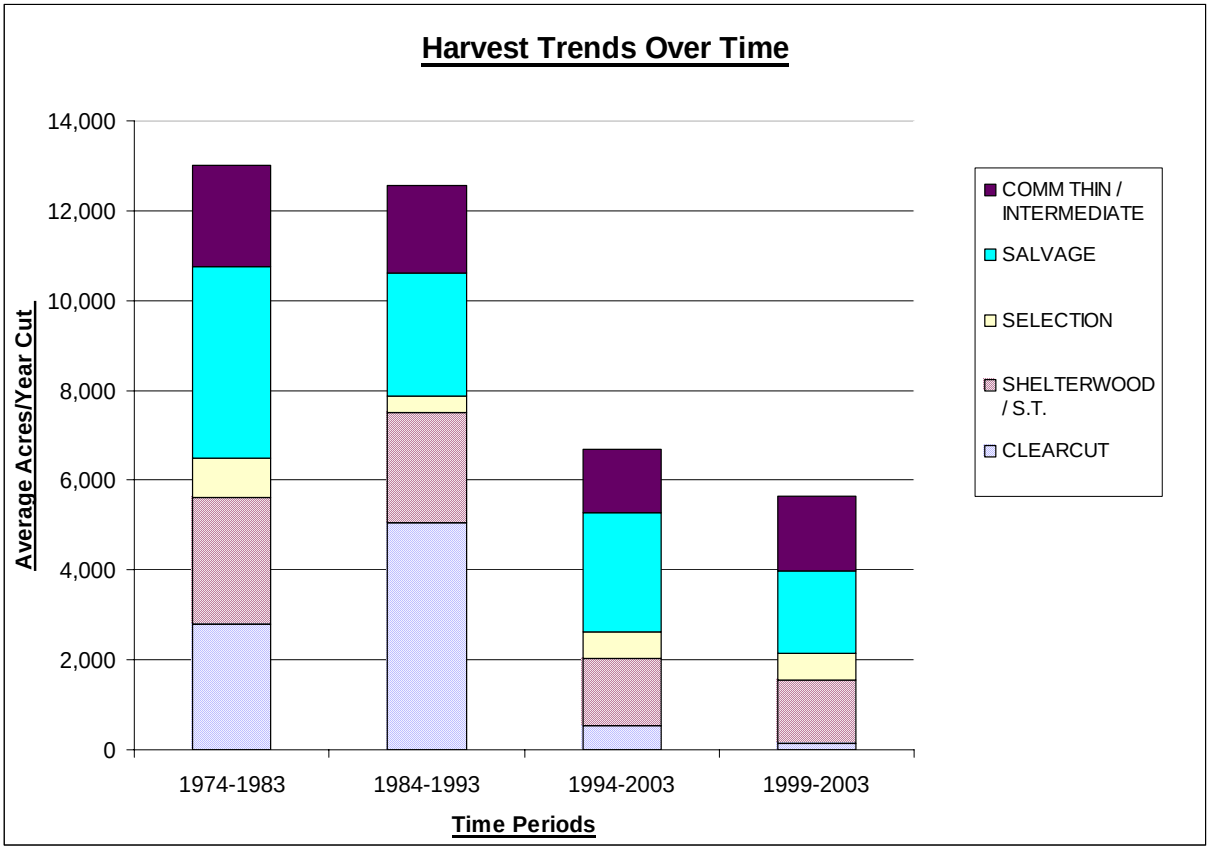


Figure 11. Distribution of Idaho Panhandle National Forests Harvest Types in the Last Five Years

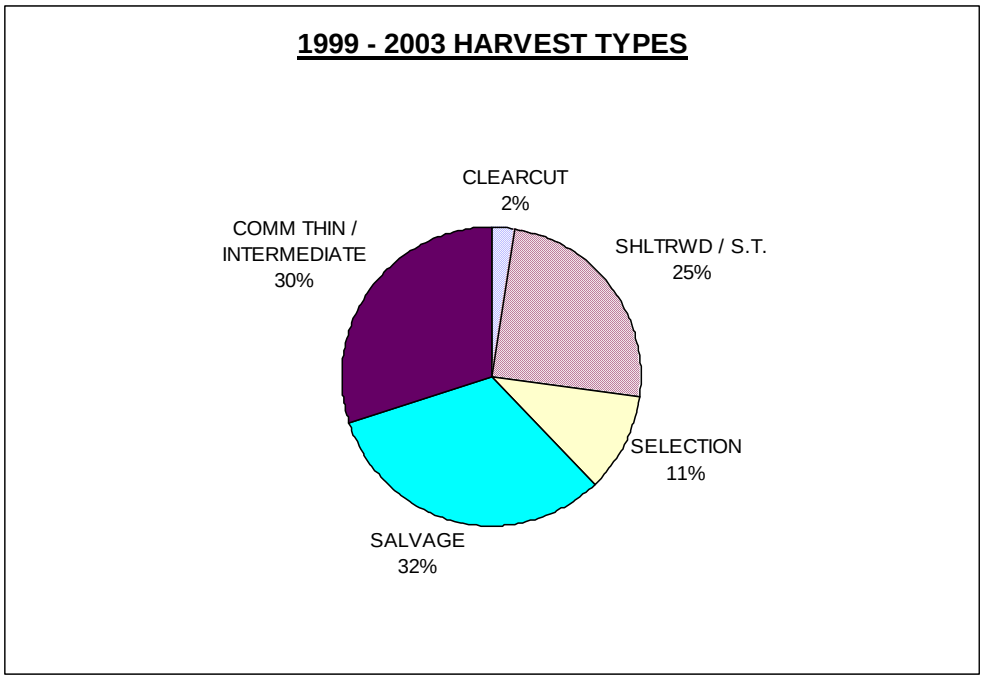


Table 57. Comparison of Historic and Current Disturbance Extents

Disturbance Agent	Average Annual Acres Affected	% of Idaho Panhandle National Forest Affected Annually	% of Comparable Historic Fire Acres
Historic Wildfire (all severities)	31,000 ac./yr.	1.2%	n.a.
Historic Stand Replacing Fire	13,000 ac./yr.	0.5%	n.a.
Current --All Fires *(annual average over last 35 yrs.)*	772 ac./yr.	0.03%	2.5% (1)
Current -- Stand Replacing Fires *(annual average over last 35 yrs.)*	695 ac./yr.	0.03%	5.3% (2)
All Timber Harvests *(last 5 yr. average annual)*	5,657 ac./yr.	0.2%	18.2% (1)
Regeneration Harvests *(last 5 yr. average annual)*	1,541 ac./yr.	0.06%	11.9% (2)
Prescribed Fire (broadcast burns) Not Associated w/ Timber Harvest *(5 yr. average annual)*	2,472 ac./yr. (3)	0.1%	19.0% (2)
Total – Current Wildfire + All Human Disturbances	8,901 ac./yr.	0.4%	28.7% (1)
Total – Current Stand Replacing Wildfire + All Human Stand Replacing Disturbances	4,708 ac./yr.	0.2%	36.2% (2)

(1) Compared to historic wildfire (all severities).
(2) Compared to historic stand replacing fire.
(3) Assume all prescribed burns are stand replacing.

Table 57 (previous page) summarizes and totals the extent of current wildfire plus all these human disturbances, and compares them to historic wildfire effects extrapolated from the Coeur d'Alene Fire History Study. **It's noteworthy that the average annual total of all current stand replacing wildfires, <u>plus</u> all current stand replacing human disturbances (clearcut, seed tree, and shelterwood harvests plus prescribed fire) averages 4,708 acres per year. This is equivalent to only about 36% of average annual historic stand replacing wildfire acres. This would effectively give the Idaho Panhandle National Forests a mean of 531 years between stand replacing events,** compared to a historic mean of 191 years between stand replacing fires extrapolated from the Coeur d'Alene Fire History Study. This is about 2.8 times longer between stand replacing events than we would have expected from the historic ecosystem.

With less fire, insects and pathogens become much more prominent forest change agents. Many insect and disease mortality agents trend the forest toward more late succession, shade-tolerant, fire-intolerant tree species. This is especially true of many bark beetles and white pine blister rust. Today 90 percent or more of the historic white pine forest has been lost, largely as a result of the introduced disease, white pine blister rust. In the Coeur d'Alene Basin, extremely high root disease mortality rates in Douglas-fir are accelerating succession towards drought and fire sensitive grand fir and hemlock. High levels of Douglas-fir bark beetle activity within the last decade have accelerated the trend to grand fir and hemlock, and have led to fuels buildups. On drier sites, the large open grown ponderosa pine stands are largely gone, replaced by smaller, denser stands of Douglas-fir, grand fir, or lodgepole pine. Larch historically needed fire both to regenerate and to maintain its dominance within stands, and there's much less fire today. The current levels of insect and disease activity, plus forest succession, are converting forest to dominance by late successional fire and drought sensitive firs and hemlock faster than the reduced levels of stand-replacing disturbances (both natural plus human) are pushing things the other way.

Across major parts of the forest, the formerly dominant forest species (white pine, larch, ponderosa pine) have been significantly reduced or substantially replaced by grand fir, Douglas-fir, and western hemlock, which have doubled or tripled in their coverage. This – in turn – can create an accelerating trend, because these new forests of fir and hemlock are much more drought and fire sensitive than the historic forest, and are at elevated risk from root disease, bark beetles, and defoliating insects. However, this current trend may not continue indefinitely. Fuels building up from increased insect and disease mortality can in turn elevate the risk of large, high-severity wildfires. Concern about these trends is leading to Forest Service projects where one purpose and need is to restore the historic early seral, shade-intolerant, fire-adapted tree species that are better adapted to natural disturbance forces.

Appendices

A. Forest Plan Monitoring Requirements

B. Programmatic Forest Plan Amendments

C. List of Contributors

Appendix A. Forest Plan Monitoring Requirements

Table 58. 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 replace Forest Plan Appendix S (Best Management Practices) with Forest Service Handbook 2509.22 (Soil and Water Conservation Practice Handbook).

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

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

4) The next amendment was signed on December 7, 1994. The purpose of this amendment was to comply with the Arkansas-Idaho Land Exchange Act of 1992. Through this land exchange, the IPNF acquired a total of 10,026 acres of land (9,114.44 acres from the Bureau of Land Management (BLM) and 912.1 acres from Potlatch Corporation). In turn, the 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) The most recent amendment updated standards and guidelines for management of the Salmo-Priest Wilderness Area. This amendment applied to both the Colville and Idaho Panhandle National Forests portions of the wilderness area. The Decision Notice was signed by the Colville National Forest Supervisor on November 20, 1995, and the Idaho Panhandle National Forests Supervisor on January 23, 1996.

Appendix C. List of Contributors

The following individuals contributed information to this report:

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Appendix D
Water Quality Monitoring Results

Monitoring Report for fiscal year 2003
Priest Lake Ranger District

Jill J. Cobb
District Hydrologist
March 25, 2004

Road Obliteration Monitoring:

Field reviews in 1998 and 1999 documented the following concerns on the last 1.6 miles of Road 333.

1) The road fill had relatively large volumes of slash that contributed to the failing road fills.
2) A relatively large portion of the road was in the Q2 floodplain of Goose Creek
3) Numerous segments of the road had extensive rills that were delivering sediment to Goose Creek.
4) The riparian zone adjacent to Road 333 was not fully functioning because of the location of the road in the riparian zone.

As a result of these concerns, a decision was made in the Douglas Fir Beetle Record of Decision (1999), to obliterate this portion of Forest Service Road 333. With the assistance of the services contract and a trained Hydrologic Technician, the work was accomplished as of August 27, 2001. As part of the project, all the culverts were removed and the crossings were reshaped, slash was used to provide microclimates for vegetation and sediment traps and the site was planted with cedar seedlings. The project was field reviewed by the District Hydrologist and a Hydrologic Technician on October 25, 2002, about 15 months after the work was completed.

The focus of the 2002 field review was upon the effectiveness of the project and how well the project met the original objectives as defined in the Douglas-fir Beetle EIS. The original objectives of the road treatment were

1) To restore the riparian habitat along Goose Creek
2) To reduce the delivery of sediment to the stream from Road 333
3) To remove a road that was encroaching on the riparian zone and floodplain

Overall, the project was a success and the field review documented that great improvements were made toward reaching all three original objectives. Overall, the crossings were stable but on a couple of sites, there could have been more fill removed than what was actually accomplished. In one location, a seasonal flowing stream had cut a small rill (6 to 12 inches deep) across the road prism. Despite the rilling, most of the eroded material was trapped immediately down slope by existing woody debris. Another area where improvement was needed was in the planting of the cedars. It appears that about 85% of the planted trees survived the planting. The loss of cedars could be attributed to the handling of the tree stock or to the quality of the actual planting. The slash left on the treated road surface created microsites and improved soil stability. We also noted that the grass seeding and native recolonization of the site was providing some ground cover. The grasses and forbs covered about 75% of the roadbed.

Figure 12. Photo showing recontoured section of Road 333 with slash mulch and revegetation with grasses and limited trees

Figure 13. Photo showing a recontoured drainage with use of rock, grass and mulch to stabilize the site

Monitoring Report for fiscal year 2003
Coeur d'Alene River Ranger District

Cathy Slinger
January 29, 2004

Type of Monitoring: Implementation

District: Central Zone

Project Name: West Fork Steamboat Creek Phase II Rehabilitation Project

Site Locations: Forest Roads 458, 601, 2312, 6322, 6344, and 6623.

The West Fork Steamboat Phase II Rehabilitation public works contract implemented restoration work on a total of 10 miles on six different roads. A total of 26 stream channel crossings were removed on these six roads. There were 2 Category I, 5 Category II, 8 Category III, 10 Category IV and 1 Category V stream channels restored. Each of these sites removed had gradient control devices installed. There were 8 drainage ditches removed. Full obliteration was not required for watershed improvement on these roads, but all 6 roads had 200 ft. front-end obliteration. There were 39 water bars constructed across the running surface of 3 roads. Roads 601, 6322, and 6344 had both ends of the road obliterated for closures. Roads not water barred had a flat surface and did not require that prescription. All channel sites on these roads were restored to natural conditions regardless of the prescription applied to the rest of the road.

The West Fork Steamboat Creek had 4.2 miles of Roads 458 and 2312 obliterated, with 10 culverts removed, 2 of those culverts being 4 ft.x3 ft. arch pipes. All excavated areas were seeded with native seed mix except for water bars. Fertilizer was used in conjunction with the seed mix, excluding 50 ft. on each side of a channel site. Road 6441 was removed from the contract due to usage needs for planting contracts.

The Spruce Creek Rehabilitation public works contract implemented restoration work at the end of the 2003 field season. With winter approaching, restoration was completed on only Road 240UG. A total of 0.1 miles was treated on this road, with a total of one stream channel crossing (Category II) removed. There were 4 gradient control devices installed. Full obliteration was not required for watershed improvement on this road, but a 200 ft. front-end obliteration was done to close the road. A water-bar was constructed across the running surface of the road to allow for water to run off. Riparian Road 240 had 64 logs hauled in and were placed in the flood plain by an excavator for large woody debris recruitment. This project will continue in the summer of 2004.

Tepee Wetland Effectiveness Monitoring Report 2003: 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 as a result of the Bunco Road improvement project. The goal was to create 3 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 built during 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 location. 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 (Figure 5). The pictures were repeated in August of 2002 and October 2002 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 have been 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:

1) The wetland perimeter was planted with willow and cottonwood on a 3 foot by 3 foot spacing.
2) Mountain alder was scattered throughout the willow and cottonwood.
3) The wetland interior was planted with willow and cottonwood on a 4 foot by 4 foot spacing.
4) 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 reviewing the wetland area the district hydrologist made a recommendation to lower the northern quarter approximately one foot to bring the wetland surface closer to the water table so that wetland plant species could be propagated and maintained (Figure 7). Additional money in future years will be sought to accomplish this. This section was not planted. Willow and cottonwood not needed for the wetland were planted at the top of point bars and along riffle banks in the Tepee Creek stream channel (Figure 8). At this point the south end of the wetlands have not been lowered because money has not been secured for this work.

In 2003 after visual observation, it was determined that the survival rate for planted species was approximately 50%, but it is noted that natural regeneration of plants and grasses is occurring very nicely.

Figure 14. An overview of the wetland one year after construction

Figure 15. Wetland in 2003 after planting

Figure 16. Flooded areas of wetland after planting

Figure 17. Same view in 2003

Figure 18. Wetland Photo in 2002

Figure 19. Wetland Photo in 2003

Figure 20. Tepee Wetlands Photo in 2002

Figure 21. Tepee Wetlands Photo in 2003

Figure 22. Wetland Photo in 2002

Figure 23.Wetland Photo in 2003

We will continue to monitor the wetlands yearly through visual observation and photo points.