Idaho Panhandle National Forests

FOREST PLAN

MONITORING AND EVALUATION REPORT

2005 and 2006

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I. INTRODUCTION

The monitoring and evaluation process compares the end results that have been achieved to the projections made in the Forest Plan. Costs, outputs, and environmental effects, both experienced and projected, are considered. This process comprises a management control system, which provides information to the decision maker and the public on the progress of implementing the Forest Plan. Monitoring is designed to gather data necessary for the evaluation. During evaluation, data provided through the monitoring effort are analyzed, interpreted, and then used to determine if the implementation of the Forest Plan is within the bounds of the plan. Annual reports have been prepared from fiscal year 1988 through fiscal year 2006.

The Forest Plan identifies 21 monitoring and evaluation items. (See Appendix A for requirements.) It requires that 11 items be reported every year, one be reported every 2 years, and 9 others be reported every 5 years. All 22 items were reported in fiscal year 2003; the items that are included in this year's report include:

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

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

II. SUMMARY OF FINDINGS

A few of the key findings are briefly summarized below. More details can be found in the section that discusses the desired monitoring item in the body 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 2005, 40.6 MMBF was offered, 23.4 MMBF was sold and 37.2 MMBF was harvested. In fiscal year 2006, 45.6 MMBF was offered, 26 MMBF was sold, and 15.8 MMBF was harvested. The number of acres sold for harvest in 2005 and 2006 were 3,081 and 2,654, respectively. Payments to counties in fiscal year 2005 and 2006 totaled $8,556,512.91 and $8,642,078.04, respectively.

- The woodland caribou population remains stable when compared to survey estimates from previous years. Thirty-five and 38 woodland caribou, respectively, were counted in the 2005 and 2006 winter aerial survey. The grizzly bear habitat changed little for fiscal year 2005 and 2006, with seven of fifteen Grizzly Bear Management Units meeting all core and road density standards.

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

- Opportunities to use funds from a variety of sources to restore ecosystems continue to be sought after. Examples of forest ecosystem restoration work for fiscal years 2005 and 2006 are listed below. (Note: See the Ecosystem Restoration section of this report for more details.)
    - Planting approximately 664,538 rust resistant white pine seedlings.
    - Planting approximately 5,790 acres of white pine, larch and ponderosa pine. These are species that are in short supply on the IPNF.
    - Reducing forest density by thinning 5,633 acres, most of this released larch, white pine and ponderosa pine.
    - Pruning 5,416 acres of white pine saplings. This reduces mortality from white pine blister rust.
    - Integrated weed treatments were accomplished on 8,572 acres.
    - There were 12,656 and 9,861 acres of harvest related natural fuel reduction and 20,783 and 21,322 acres of natural fuel reduction.
    - Improving 61 and 336 acres of soil and water resources.
    - Decommissioning of 49 and 50 miles of roads.

- Forest plan standards call for us to maintain 231,000 acres of old growth (10 percent of our forested acres). For 2006, the estimated percentage of old growth on all forested lands on the IPNF, using Forest Inventory and Analysis (FIA) data, is 11.8% with a 90% confidence interval of 9.6% to 14%.

Table 1 is a quantitative summary of some of the forest's other accomplishments for fiscal years 2005 and 2006.

III. MONITORING ITEMS

This section contains the monitoring and evaluation results for fiscal years 2005 and 2006 for some of the monitoring items discussed.

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	
	2005	**2006**
Budget	$23,233,700.00	$24,284,800.00
Total number of employees	468 (permanent and temporary)	421 (permanent and temporary)
Volume of timber offered	40.6 million board feet	45.6 million board feet
Volume of timber sold	23.4 million board feet	26 million board feet
Volume of timber harvested	37.2 million board feet	15.8 million board feet
Total acres of timber sold	3,081 acres	2,654 acres
Payments to counties	$8,556,512.91	$8,642,078.04
Total reforestation completed*	3,730 acres	4,079 acres
Total number of seedlings planted	962,433	1,048,631
Timber stand improvement completed	2,933 acres	2,700 acres
Pruning of white pine	3,033 acres	2,383 acres
Soil and water improvement completed	61 acres	336 acres
Roads maintained	1,601 miles	1,775 miles
Roads constructed	0 miles	5.5 miles
Roads reconstructed	838 miles	232 miles
Roads decommissioned	49 miles	50 miles
Trails constructed/reconstructed	25 miles (plus 5 bridges)	36 miles
Trails maintained to standard	351 miles	557 miles
Number of wildfires	67 fires	201 fires
Acres burned by wildfire**	46 acres	9,339 acres
Harvest related fuel treatment	12,656 acres	9,861 acres
Hazardous fuels reduction	20,783 acres	21,322 acres
Wildlife habitat enhanced	610 acres	2,121 acres
Wildlife habitat inventoried	560 acres	0 acres
TES terrestrial habitat inventoried	477,637 acres	353,450 acres
Noxious weeds treated	4,000 acres	4,572 acres
Abandoned/inactive mines	16 sites addressed	21 sites addressed

*Includes both planted and natural regeneration that was established in 2005 and 2006.
**Includes three Wildland Fire Use events for a combined total of 560 acres

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 information is presented 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 in the county and the amount of national forest land within the county.

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

Monitoring Data

Table 2. Payments to Counties with Harvested Timber Volume

Fiscal Year	Payments(MM$)	Volume (MMBF)
1991	5.4	232
1992	7.4	235
1993	6.0	134
1994	6.4	117
1995	5.8	87
1996	6.0	81
1997	3.9	57
1998	4.8	85
1999	3.1	75
2000	4.0	90
2001	8.0	51
2002	8.1	41
2003	8.1	53
2004	8.2	40
2005	8.5	37
2006	8.6	16

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

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

Evaluation: Table 3 depicts how receipts have been distributed to counties for the years 1991 to 2000. There are seven counties in Idaho, two in Montana, and one in Washington that received payments from IPNF activities. The base for the 25 percent payment to states by the IPNF for fiscal year 2000 was collection of $15,248,318.73. Timber volume harvested in FY 2000 was 90 million board feet, which increased from 58 million board feet in fiscal year 1999. Receipts to counties in fiscal year 2000 totaled $3,991,166, an increase of $868,870 from fiscal year 1999.

The receipts to counties from 1991 to 2000 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 was not as proportional as the fall down in timber volumes from a high of 280 million board feet to a low of 57 million board feet because of the increase in the value of the timber during this same period.

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

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

Table 4 shows the payments made for fiscal year 2001 to the five Northern Idaho counties in accordance with the Secure Rural Schools and Community Self-Determination Act of 2000 (Public Law 106-393). Under this legislation, payment amounts are determined based upon each county's share of the average of the three highest 25 percent fund payments made to the state during the base period (fiscal years 1986 through 1999). This act also provides that 15 to 20 percent of the total disbursement to each county can be used to finance either Forest Service (Title II) or County (Title III) projects, as determined by each county. Depicted in this table is the total disbursement to each county, as well as the percentages and amounts distributed between Title II and Title III funded projects. Tables 5, 6, 7, 8 and 9 below show the same information for fiscal years 2002 through 2006.

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

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

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

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

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

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

Table 8. Distribution of Payments to Five Northern Idaho Counties, Fiscal Year 2005

County	Total Disbursement	% Split Title II/Title III	Title II (Forest Projects)	Title III (County)
Benewah	$121,971.76	50/50	$18,295.76	$0
Bonner	$1,357,768.54	15/0	$203,665.28	$0
Boundary	$1,436,432.47	12.75/2.25	$183,145.14	$32,319.73
Kootenai	$1,069,474.95	15/0	$160,421.24	$0
Shoshone	$4,140,330.31	15/0	$579,646.25	$41,403.30
Total	**$8,125,978.03**		**$1,145,173.67**	**$73,723.03**

Table 9. Distribution of Payments to Five Northern Idaho Counties, Fiscal Year 2006

County	Total Disbursement	% Split Title II/Title III	Title II (Forest Projects)	Title III (County)
Benewah	$123,191.48	50/50	$18,478.72	$0
Bonner	$1,371,346.23	15/0	$205,701.94	$0
Boundary	$1,450,796.79	12.75/2.25	$184,976.59	$32,642.93
Kootenai	$1,080,169.70	15/0	$162,025.45	$0
Shoshone	$4,181,733.61	15/0	$595,897.04	$31,363.00
Total	**$8,207,237.81**		**$1,167,079.74**	**$64,005.93**

B. Forest Service Employment

Background

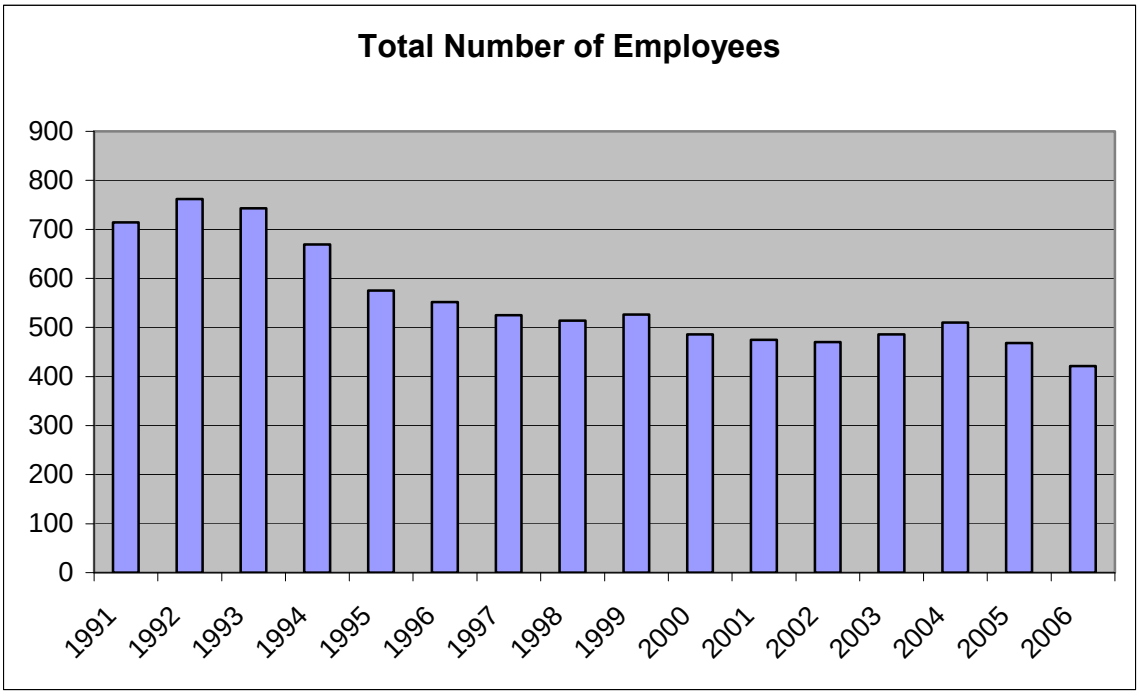
Employees of the Idaho Panhandle National Forests help to stimulate the economy by actively participating in their local economies. As Forest Service employment rates fluctuate each year, the amount of money contributed to the local economy also tends to fluctuate.

Monitoring Data

Table 10. Total Number of Employees

Fiscal Year	Employees
1991	714
1992	762
1993	743
1994	669
1995	575
1996	552
1997	525
1998	514
1999	526
2000	486
2001	475
2002	470
2003	486
2004	510
2005	468
2006	421

Figure 1. Total Number of Employees



Evaluation: Table 8 and Figure 1 show how the forest workforce has changed from 1991 to 2004. In fiscal year 1992, employment was at a high of 762 permanent and temporary employees and decreased to 421 at the end of fiscal year 2006. This decrease in employment has had a greater effect on the smaller communities such as Bonners Ferry, Wallace and St. Maries than on larger communities such as Coeur d'Alene and Sandpoint where significant population growth has occurred.

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 Years 2005 and 2006: For these fiscal years, respectively, the Idaho Panhandle National Forests offered 40.6 and 45.6 million board feet of timber for sale. We sold 23.4 and 26 million board feet, respectively.

Fiscal Years 1991-2006: Table 11 depicts timber volumes offered and sold and sale acreages for the past 13 years. Figure 2 that follows Table 11 graphically presents trends in volumes offered and sold. Figure 3 shows total acres sold.

Table 11. Timber Volumes Offered and Sold (MMBF) and Total Acres Sold

Fiscal Year	*Volume Offered*	*Volume Sold*	*Total Acres Sold*
1991	201.6	163.2	13,989
1992	127.2	108.0	10,508
1993	109.4	124.3	13,939
1994	44.9	16.4	4,283
1995	64.1	37.5	8,437
1996	75.4	42.9	8,631
1997	79.3	108.3	10,914
1998	76.3	90.3	6,974
1999	63.4	30.3	8,751
2000	76.3	78.2	7,332
2001	65.8	40.7	5,626
2002	57.2	55.4	5,383
2003	42.2	22.1	3,282
2004	51.3	59.5	8,085
2005	40.6	23.4	3,081
2006	45.6	26	2,654

Figure 2. Timber Volume Offered (Series 1) and Sold (Series 2)

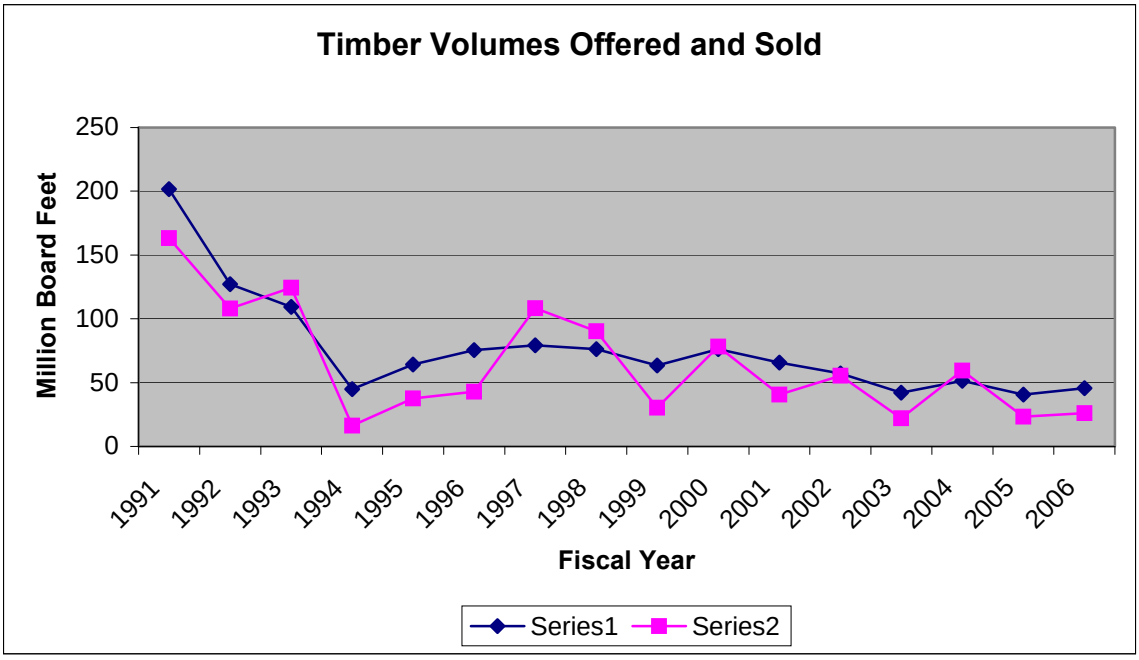
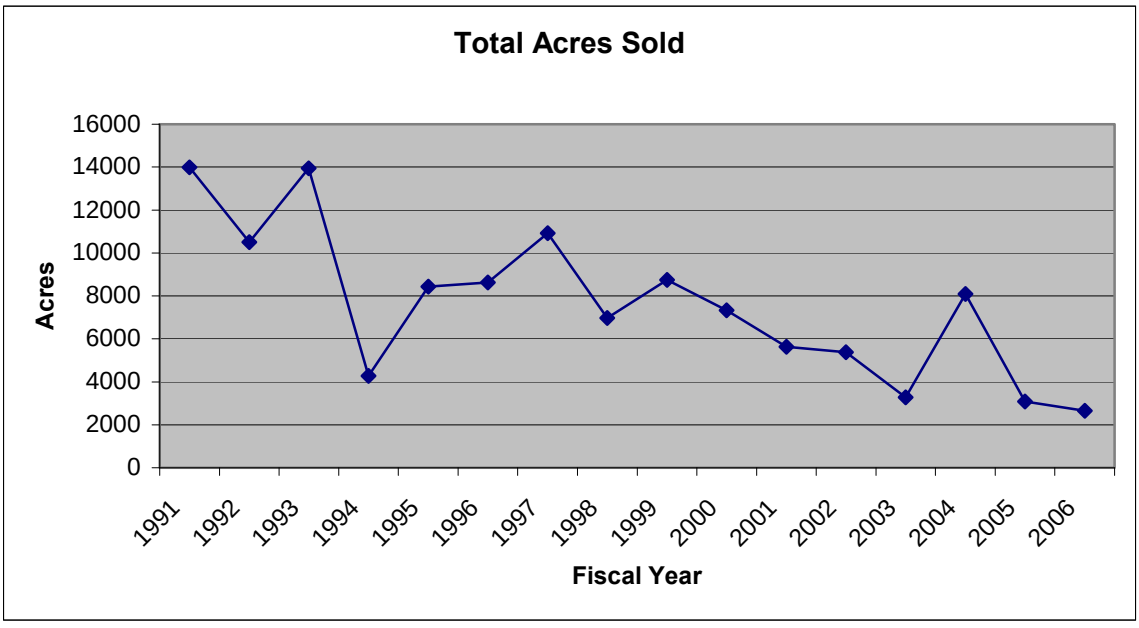


Figure 3. Total Acres Sold



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 2006 volume sold and acres sold has fallen below the 75-percent 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 on the IPNF is being addressed in forest plan revision.

Forest Plan Monitoring Item C-1: Visual Quality

Item C-2 addresses monitoring of timber sales on the Idaho Panhandle National Forests to assess effectiveness meeting Forest Plan Visual Quality Objectives (VQOs). This report provides a summary of projects. Detailed reports are available at District Offices.

Visual Quality Objectives were established for the management of public lands in response to public outcries over clearcut harvest methods. VQOs are, in essence, the IPNFs' contract with the public for the way in which the IPNF will manage public lands. From 1992 to present the IPNF has moved away from clearcut harvests to the incorporation of lighter-on-the-land techniques to manage the timber resource. In 1993, the largest number of acres or 8% of the total harvested was clearcut. There were no clearcut harvests from 1998-2000. In fiscal year 2001, of the total acres harvested, 0.9% was clearcut. In fiscal year 2001, the two most used harvest methods were salvage harvest and commercial thinning. These methods were used on 43% and 28% of total acres respectively. This trend has continued and has resulted in more sustainable and natural landscapes.

Forest VQOs describe a desired level of scenic quality and diversity of natural features based primarily on physical characteristics of an area. They refer to the degree of acceptable change allowed to alter the natural landscape. In the mid-1990's the Forest Service created and published an updated outgrowth of the Visual Management System, called the Scenery Management System. According to Deputy Chief, NFS, Gray Reynolds in a letter on Public Perception dated August 22, 1994, this effort was "guided by a significant increase in constituent demand for high-quality scenery," and the public's insistence "that scenery is one of the most highly valued resources in our national forests." The IPNFs' Scenery Management System (SMS) GIS inventories are complete and will be part of the revised Forest Plan once approved.

Fiscal Year 2005 & 2006 Visual Monitoring

Forest Plan Monitoring Item C-1: Achieving Visual Quality. Determine if project activities implemented meet forest plan visual quality objectives.

Frequency of measurement: Annual

Threshold: A 10% departure from forest plan direction after five years initiates further action.

How we did in Fiscal Years 2005 & 2006

Results of fiscal years 2005 and 2006 harvest activities meeting Visual Quality Objectives were not available in their entirety at the time the information was requested. As a result of this, a summary of 2005 and 2006 meeting Visual Quality Objectives will be included in the FY 2007 monitoring report. The report will be compiled from tallies of the following information.

SOUTH ZONE – St. Maries & Avery Ranger Districts

Table 12. South Zone Timber Sales Sold in Fiscal Years 2005 and 2006

Timber Sale Name & Award Date		Was project designed to meet Forest Plan VQO's?
Tam Thin	06/13/05	Yes, no retention/partial retention
Tin Cup	11/04/05	Yes, no retention/partial retention

Table 13. South Zone Timber Sales Closed Fiscal Years 2005 and 2006

Timber Sale Name & ClosureDate		VQO's Met?	Remarks
Cowardly Lion Deck	08/16/05	Yes	No retention/partial retention
Rye on Ham III	09/27/05	Yes	Rx's meet partial retention
Donkey King Returns	08/16/06	Yes	No retention/partial retention
Jack Flash	12/06/05	Yes	No retention/partial retention
Turn Away	12/01/05	Yes	No retention/partial retention
Lower Marble II	10/07/05	Yes	No retention/partial retention
Charlie Horse II	06/30/05	Yes	No retention/partial retention
PT Siam	12/30/05	Yes	No retention/partial retention
DS Anthony Pine	12/14/04	Yes	No retention/partial retention
Golden Wind	11/30/04	Yes	Unit boundry's adjusted during prep to meet partial retention
Tin Cup	12/13/2006	Yes	No retention/partial retention

CENTRAL ZONE – Coeur d'Alene River Ranger District

Table 14. Central Zone Timber Sales Sold in FY 2005 & 2006

Timber Sale Name & Award Date		Was project planned to meet Forest Plan VQO's?
Clover Thin	09/20/04	Yes
Flat Roundwood	10/26/04	Yes
Ridge Runner Thin	07/27/06	Yes
Barker Thin	05/04/05	Yes
CDA Vista Thin	06/14/05	Yes

Table 15. Central Zone Timber Sales Closed in FY 2005 & 2006

Timber Sale Name & Closure Date		VQO's Met?	Remarks
Small Beetle Trails	10/27/05	Yes	Based on limited review.
Yon Ferguson	06/14/06	Yes	Based on limited review.
Brown's FW	01/27/06	N/A	Fuelwood sale
Brewski	05/12/05	Yes	Ski area runs met planned VQO's
Thompson Creek FW	01/11/06	N/A	Fuelwood sale
Dead Grassy	01/27/06	Yes	Based on limited review
1578 FW	11/30/05	N/A	Fuelwood sale

NORTH ZONE - Sandpoint Ranger District

Table 16. North Zone Timber Sales Sold in Fiscal Years 2005 and 2006

Timber Sale Name & Award Date		Was the project planned to meet Forest Plan VQO's?
Sam Owen Fuels	11/17/04	
Wrenco	09/20/06	

Table 17. North Zone Timber Sales Closed in Fiscal Years 2005 and 2006

Timber Sale Name & Closing Date	VQO's Met?	Remarks
Little B Tail 08/16/06		Report unavailable at this time
Derr 75 Thin 02/15/06		
Blanchard Pole 01/31/06		
Cocolalla West 01/03/06		
Jeru Lindsey 09/02/05		
Longshot 11/30/04		
Saddle Up 11/30/04		

NORTH ZONE - Bonners Ferry Ranger District

Table 18. Timber Sales Advertised and/or Sold in Fiscal Years 2005 and 2006

Timber Sale Name & Award Date	Was the project planned to meet Forest Plan VQO's?
Boundary 02/09/06	Yes – Partial Retention
Brushy Mission 09/29/06	Yes – Partial Retention
Haller Down 09/29/06	Yes – partial Retention
Mission Fly By No bids	Yes – Partial Retention

Table 19. Timber Sales Closed in Fiscal Years 2005 and 2006

Timber Sale Name & Closing Date	VQO's Met ?	Remarks
Bussard Lake 08/31/05	Yes	
Hasta La Fiesta 05/23/06	Yes	
Moyie Place 05/22/06	Yes	
Moyie Wood 09/13/05	Yes	
Deer Skin Roundwood 08/12/05	Yes	
Salt Lick 08/02/05	Yes	
No Da 07/20/05	Yes	
Kootenai Small Thin 06/28/05	Yes	
Phase III 06/09/05	Yes	
Dawson 4 11/22/04	Yes	

Table 20. Timber Sales Closed in Fiscal Year 2005

Sale Name	VQO's Met ?	Remarks
Kootenai Small Thin (CE) Closed 06/28/2005	Yes	This sale, implemented under the Kootenai Small Thin Categorical Exclusion in 2003 (CE #12, Limited Timber Harvest) involved 46 acres of improvement cutting and 17 acres of commercial thinning. The improvement cutting was a continuation of an uneven-aged management prescription that was initiated with the Kootenai Small Sale in 1992. The commercial thinning occured in previously untreated stands that were adjacent to the original harvest. The long-term objective is to manage all 63 acres under an uneven-aged management system. All treatments have met the VQO of Retention (High SIO).

Kootenai Small Thin Unit 2 "Before Harvest"	Kootenai Small Thin Unit 2 "After Harvest"
	

Sale Name	VQO's Met ?	Remarks
No Da Closed 07/20/2005	Yes	This sale, implemented under the North Dawson Hazardous Fuels Reduction Categorical Exclusion in 2003 (CE #10 HFI) involved reducing the fine (1 hour) and ladder fuels in order to transition the project area from a fuel model 10 to a fuel model 9. Fire behavior in this model is decreased, where slower burning surface fires with lower flame lengths (<3 ft.) are more characteristic. In the event of a wildfire, the treatment should reduce the safety risks to suppression forces and adjacent landowners and make protection of structures and the Northern Lights power line right-of-way easier and less costly to accomplish. Decreasing stand densities and removing nearly all the ladder fuels will lower the probability of a surface fire moving into the tree crowns. It will make direct suppression attack more effective, while creating a safer working environment for firefighters. All treatments have met the VQO of Partial Retention (Moderate SIO).

No Da Hazardous Fuels Reduction Unit 1 Before Treatment	No Da Hazardous Fuels Reduction Unit 1 After Treatment
	

Sale Name	VQO's Met ?	Remarks
Salt Lick Closed 08/02/2005	Yes	This sale was implemented under the Myrtle-Cascade Environmental Impact Statement (2001). The purpose of this sale was to restore historic structure and composition to the project area, to improve tree vigor, reduce susceptibility to insects, diseases, and wildfires, to provide wildlife habitat and to maintain the hydrologic function. The project included a combination of commercial thinning, sanitation salvage, overstory removal and irregular shelterwood harvest treatments on about 268 acres. All treatments have met the VQO of Partial Retention (Moderate SIO).
Deerskin Roundwood Closed 08/12/2007	Yes	This was one of 4 sales implemented under the Skin Creek EA (1997) and included 216 acres. The purpose of this sale was reduce overall stocking to promote healthy and vigorous stand conditions, to favor the development of larger diameter long-lived seral species (WP & DF), and to promote white-tailed deer winter range habitat. The entire sale removed mostly small diameter trees (i.e. less than 9" dbh). The sale easily met the Partial Retention VQO along this level 2 road, and actually enhanced the visual character by thinning out doghair stands of small diameter trees and leaving the largest and healthiest looking Douglas-fir and larch dominated timber stands.

Deerskin Roundwood Unit 26 Before thinning treatment	Deerskin Roundwood Unit 26 After thinning treatment
	

Sale Name	VQO's Met ?	Remarks
Moyie Wood Closed 09/12/2005	Yes	This sale, implemented under the Moyie Wood Hazardous Fuels Reduction Categorical Exclusion in 2004 (CE #10 HFI) involved a commercial thin/sanitation salvage treatment in the overstory to favor the largest most fire-resistant trees. In addition, the understory was pre-commercially thinned to remove hazardous ladder fuels and involved the removal of sapling-sized regeneration, generally less than 8 feet high, which was encroaching on the larger-diameter overstory trees. The overstory treatment removed approximately one-fourth of the overstory and retained an average of approximately 30-40% forest canopy closure. In general, the trees harvested were lodgepole pine and smaller size class Douglas-fir (generally under 12 inches diameter at breast height). Large diameter ponderosa pine, western larch, and Douglas-fir now dominate the residual stand. Some smaller-diameter trees were retained for age-class diversity. The treatment has met the VQO of Retention (High SIO).

Moyie Wood, visual analysis photo point along County Road #63 (Moyie River Road) Before Treatment	Moyie Wood, from same photo point. After Treatment
	

Sale Name	VQO's Met?	Remarks
Bussard Lake, Closed 08/31/2006 And Hasta La Feista Closed 05/23/2006	Yes	This sale, implemented under the Bussard Feist Hazardous Fuels Reduction Categorical Exclusion in 2004 (CE #10 HFI) involved reducing the fine (1 hour) and ladder fuels in order to transition the project area from a fuel model 10 to a fuel model 8. In the event of a wildfire, the treatment should reduce the safety risks to suppression forces and adjacent landowners and make protection of structures and power line right-of-ways easier and less costly to accomplish. Decreasing stand densities and removing nearly all the ladder fuels will lower the probability of a surface fire moving into the tree crowns. The visual analysis completed for this project (2004) made the determination that the VQOs would be met under the following design criteria: *1. Unit(s) that are located on the west side of Bussard Lake that will utilize the skyline logging system will be the most visually sensitive treatment for the project. Care must be exercised when developing the silvicultural prescription and during the operational phase to ensure that skyline corridors are not obvious when viewed from County Road #34 (Meadow Creek Road) and especially from the Feist Creek Inn. The best way to accomplish this would be to leave a residual stand that has some space between tree crowns and that has had any dense understory slashed in order to eliminate the unnatural appearance on mountainsides created by "multiple vertical rows" of corridors that can result when treating dense timber stands. 2. In order to meet the VQO of Retention (High SIO) for that portion of the unit located in section 14 that is immediately adjacent to the county road (nearest Kreist Creek, use flashers for boundary markers along the road and minimize the use of leave tree paint marking for that portion of the unit that can be viewed by passersby on the county road. Finally, landings should not be placed immediately adjacent to the county road.*

		All treatments have met the VQOs of Retention, Partial Retention and Modification (High, Moderate and Low SIO).

Bussard Feist photo point established during visual analysis, looking at Bussard Lake TS location, 2004. 	After treatment. This is a good example of using the right prescription to eliminate obvious skyline corridors that could have been visible from this critical viewpoint at a restaurant and motel. 

Sale Name	VQO's Met ?	Remarks
Moyieplace Closed 05/22/2006	Yes	This sale, implemented under the Moyieplace Hazardous Fuels Reduction Categorical Exclusion in 2004 (CE #10 HFI) involved reducing the fine (1 hour) and ladder fuels in order to transition the project area from a fuel model 10 to a fuel model 8. In the event of a wildfire, the treatment should reduce the safety risks to suppression forces and adjacent landowners and make protection of structures and the Northern Lights power line right-of-way easier and less costly to accomplish. Decreasing stand densities and removing nearly all the ladder fuels will lower the probability of a surface fire moving into the tree crowns. The visual analysis completed for this project (2004) made the determination that the VQOs would be met under the following design criteria: *1. Unit(s) in and immediately adjacent to Meadow Creek Campground and around the Meadow Creek townsite (both locations are on south side of Moyie River) will meet Retention as long as 40 to 50 percent of the existing and largest available trees per acre remain (excluding hazard trees). Use flashers for boundary markers next to campground and remove after project is completed. If paint is needed to designate trees, use cut-tree designation rather*

		than leave-tree marking. Landings should not be placed immediately adjacent to roadsides. *2. All other units will meet Partial Retention with the proposed treatments as long as the areas immediately adjacent to Meadow Creek and Placer Creek roads maintain at least 40-50 percent of the current tree stocking, concentrating on leaving the largest available trees. If paint is needed to designate trees, use cut-tree designation rather than leave-tree marking. Shelterwood treatments that occur farther than about 300 feet off the roadsides would meet the Partial Retention VQO. Landings should not be placed immediately adjacent to these roadsides.* All treatments have met the VQOs of Retention and Partial Retention (High and Moderate SIO).

Moyieplace at Meadow Creek C.G. entrance, example of stand condition prior to treatment	Moyieplace following harvest at Meadow Creek Campground entrance
	

NORTH ZONE - Priest Lake Ranger District

Table 21. Timber Sales Advertised and/or Sold in Fiscal Years 2005 and 2006

Timber Sale Name & Award Date		Was the project planned to meet Forest Plan VQO's?
Kedish Ridge Hazardous Fuels	04/11/05	Yes
57 Bear Paws	03/03/06	Yes

Table 22. Timber Sales Closed in Fiscal Years 2005 and 2006

Timber Sale Name & Closure Date		Were VQOs Met?	Remarks
Canyon Creek	7/28/06	N/A	Sale is within the Priest River Experimental Forest. Due to the nature of the Experimental Forest, VQO reports are not applicable and not completed.
Gleason Pine	2/28/06	Yes	

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 source 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 2006.

Table 23. Total Number of Violations Issued

Fiscal Year	Number of Violations
1991	144
1992	167
1993	204
1994	185
1995	88
1996	133
1997	240
1998	246
1999	394
2000	164
2001	285
2002	191
2003	445
2004	411
2005	337
2006	298

Evaluation

Eight different types of off-road vehicle violations are commonly noted. Examples of these include the following: damaging roads, trails, or gates; operating vehicles in a manner that endangers any person or property; use which damages or unreasonably disturbs the land, wildlife or vegetative resources; 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. However, it can be used as a general indicator of trends in violations and law enforcement activities associated with off-road vehicles. During fiscal year 2006, 298 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 Forest monitors land disturbing projects to identify potential impacts to heritage resources. The IPNFs' 2006 monitoring program concluded that forest projects generally caused no adverse effects to heritage resources. However, several projects were incorrectly implemented leading to adverse effects to eligible cultural properties. All effects were disclosed to the proper agencies and action was taken to ensure future projects did not have similar implementation problems.

Vegetative Treatments (Timber Sales and Fuel Reduction Projects)

The Forest reviewed eight timber sale or fuel reduction projects. Five of these projects required no field inventory work, while three required field review of the proposals. The forest heritage resource staff determined that one of these projects could affect heritage resources, however, final design has not been completed and the project has not yet been implemented. Based on the preliminary design no adverse effects are expected for the final project.

Lands (Land Conveyance Projects)

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

Roads

Two road projects were reviewed that were determined to have no effect to heritage resources.

Range

No allotments were reviewed in 2006.

Trails

Six trail projects were reviewed and five were determined to have no effect to heritage resources. The last project along the Coeur d'Alene River was relocated away from the historic trail so there would be no effect on heritage resources.

Special Use Permits

Seventeen special use permit projects were reviewed by forest heritage resource staff. Eight projects were redesigned or were associated with mitigation so that no adverse impacts to heritage resources would occur. Project redesign and mitigation measures were reviewed and agreed upon by the Idaho SHPO. Four recreation residence projects with potential to adversely affect the historic character of the property were not implemented due to a lack of response by the home owner to a Forest Service request for additional information. One recreation residence remodel and addition project was implemented prior to consultation being concluded. The SHPO and Advisory Council on Historic Preservation were informed and full documentation was collected prior to the implementation but never sent. Documentation will be forwarded by the Forest Archaeologist. A Project Completion Memo signed by Forest Archaeologist is required prior to project implementation to avoid future consultation concerns.

Recreation

Four projects were reviewed for recreation and three were determined to have effects to heritage resources. The repair of the Milwaukee Snow Sheds on the Hiawatha Trail was implemented after appropriate mitigation recommendations were agreed to by the Idaho SHPO. Two projects had appropriate consultation to avoid adverse effects, but were incorrectly implemented. The first project was an interpretive trail project that impacted a historic cabin site when unauthorized vegetative clearing occurred. The second project involved construction of docks at a lake-based recreation site where project plans were changed due to lower than expected water levels and no consultation occurred. No actual harm was done to the adjacent site. However, discussions among the Ranger and staff resulted in adoption of better communication procedures, including use of the Project Completion Memo. The Advisory Council on Historic Preservation and SHPO were informed of both incidents.

Minerals

Two mine restoration projects were reviewed and determined to have adverse effects to heritage resources. One project was implemented after appropriate consultation with the Idaho SHPO and development of mitigation requirements. The other project is pending completion of data recovery investigations and final consultation.

Facilities

The forest undertook five projects in 2006. During reconstruction of a channel in the Avery Work Center a previously unknown historic feature was inadvertently damaged by heavy equipment. The feature was photographed and recorded and the information was sent to the Idaho SHPO. The four remaining projects were historic preservation projects involving Forest Service administrative facilities. Ongoing efforts at Bonners Ferry Ranger Station, Shoshone Park caretaker's cabin, Avery Cabin and the Snyder Guard Station focused on stabilization and restoration of these historic cabins for continued use as administrative sites and recreation rentals. The Region One Preservation Team completed the window and door restoration at the Bonners Ferry Ranger Station, log restoration, roof replacement and miscellaneous work at the Shoshone Park caretaker's cabin and window restoration work at the Ranger's house at Snyder Guard Station. They worked with district personnel and volunteers. Bonners Ferry district personnel and local volunteers performed stabilization work on several buildings at Snyder Guard Station, while Coeur d'Alene River Ranger District personnel continued work on the Avery Patrol Cabin under the indirect supervision of the Preservation Team.

Other Heritage Resource Accomplishments

The Forest actively sponsored 2006 Idaho Archaeology Week activities in Bonner and Boundary counties. The North Zone Archaeologist presented and helped sponsor five programs in Sandpoint, Bonners Ferry, Hope and Kootenai Wildlife Refuge. The history of mining on Boulder Creek and insight to the Kootenai Valley, Lake Pend Oreille, and Pend Oreille River landscapes between 1860 and 1900 was provided at the presentations. In addition, guest speakers James Woods of the Herrett Center for Arts and Sciences at the College of Southern Idaho gave a talk about "Stone Tools and Weapons of Ancient Idaho." Robert Betts of Vanguard Research spoke about "The Search for the Road to Buffalo." Francis Auld, Kevin Askin, and Ira Matt of the Confederated Salish and Kootenai Trial Preservation Office discussed "Executive Protection" and Jack Nisbett provided a lecture about David Thompson.

Draft interpretive display panels were installed at the Sam Owen Campground kiosk describing the journeys and accomplishments of David Thompson, local American Indian history, and importance of fur

trade materials. The panels were developed by the Sandpoint Ranger District, Bonner County Historical Society and Corp of Engineers.

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.

Phase 1 of the Pulaski Escape Tunnel interpretive trail was completed in 2006. Included in the project was a new trailhead, 2.5 miles of trail, and 16 interpretive signs. The project was completed by Forest Engineering staff and the Coeur d'Alene River Ranger District in partnership with the Pulaski Project Interpretive Association.

Forest Engineering staff supporting the St. Joe Ranger District completed contract restoration of a number of snow sheds associated with railroad tunnels on the Hiawatha Trail. The restoration work was accomplished according to historic preservation standards reviewed by the Idaho SHPO to preserve and protect the historic character of the railroad grade.

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 of grizzly bear habitat changed in 2004. 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).
* Linear total and open road density in grizzly bear occupancy areas adjacent to the Cabinet-Yaak and Selkirk recovery zones

The 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 24. Core, Security, Road Density Standards and Guidelines - 2005

BMU	BMU Total Acres	Federal Land (%)	Lands w/in Admin. Boundary of IPNF (%)	Open Roads >1 i/sq.mi (%)	Total Roads >2 mi/sq.mi (%)	Core (%)
Cabinet-Yaak BMUs						
Northwest Peaks[1]	82,995	99	22	28 (33)	26 (26)	56 (55) ↑
Keno[1]	51,236	99	45	*34* (33) ↑	24 (26)	61 (60)
Boulder	62,369	92	100	29 (33) ↓	*35* (29)	*49* (55)
Grouse*	66,979	54	100	*61* (59) ↑	*59* (55)	*32* (37)
North Lightning	65,216	94	100	*39* (35)	21 (26) ↑	61 (61)
Scotchman	61,612	81	100	35 (35)	26 (26)	63 (62)
Selkirk BMUs						
Blue-Grass	57,325	96	100	28 (31) ↓	*28* (26) ↓	*51* (55)
Long-Smith	65,735	92	100	21 (25) ↓	14 (15) ↑	73 (67)
Ball-Trout	57,907	94	100	17 (20)	11 (13)	72 (69)
Myrtle	63,781	85	100	32 (33) ↑	21 (22)	58 (56)
Kalispell-Granite	85,641	96	100	29 (33)	*27* (26)	*48* (55)
Salmo-Priest[2]	87,115	99	13	30 (33) ↓	25 (26) ↓	66 (64) ↑
Sullivan-Hughes[2]	78,210	99	57	*24* (23) ↑	*21* (18)	*59* (61)
Lakeshore	17,972	86	100	81 (82) ↑	51 (56)	20 (20)
Le Clerc[2]	77,715	64	9	38	58	27

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

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

Italicized and underlined numbers indicate parameters not meeting Standards.

↑ ↓ Represents change from previous year

[1]Shared BMU and administered by the Kootenai National Forest.

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

Table 25. Core, Security, Road Density Standards and Guidelines - 2006

BMU	BMU Total Acres	Federal Land (%)	Lands w/in Admin. Boundary of IPNF (%)	Habitat Effectiveness - 70 mi^2 \1	Open Roads >1 i/sq.mi (%)	Total Roads >2 mi/sq.mi (%)	Core (%)
Cabinet-Yaak BMUs							
Northwest Peaks[1]	82,995	99	22	76	28 (33)	26 (26)	55 (55) ↓
Keno[1]	51,236	99	45	64	34 (33)	25 (26) ↑	59 (60) ↓
Boulder	62,369	92	100	73	29 (33)	*35* (29)	*50* (55) ↑
Grouse*	66,979	54	100	51	60 (59) ↓	*59* (55)	*32* (37)
North Lightning	65,216	94	100	71	*40* (35) ↑	21 (26)	60 (61) ↓
Scotchman	61,612	81	100	67	35 (35)	26 (26)	63 (62)
Selkirk BMUs							
Blue-Grass	57,325	96	100	67	30 (31) ↑	*28* (26)	*50* (55) ↓
Long-Smith	65,735	92	100	85	21 (25)	14 (15)	73 (67)
Ball-Trout	57,907	94	100	77	17 (20)	11 (13)	72 (69)
Myrtle	63,781	85	100	72	31 (33) ↓	21 (22)	58 (56)
Kalispell-Granite	85,641	96	100	101	29 (33)	*27* (26)	*48* (55)
Salmo-Priest[2]	87,115	99	13	76	30 (33)	26 (26) ↑	66 (64)
Sullivan-Hughes[2]	78,210	99	57	81	24 (23)	*19* (18) ↓	61 (61) ↑
Lakeshore	17,972	86	100	10	79 (82) ↓	51 (56)	20 (20)
Le Clerc[2]	77,715	64	9	61	38	58	27

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

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

Italicized and underlined numbers indicate parameters not meeting Standards.

↑ ↓ Represents change from previous year

[1]Shared BMU and administered by the Kootenai National Forest.

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

Table 26. BMU Monitoring Summary 2005

CABINET-YAAK RECOVERY ZONE	
Keno	OMRD increased and does not meet standard. TMRD increased, but meets standard. Changes due to INFRA road database corrections. No on the ground changes.
Northwest Peak	Core decreased but still meets standards due to INFRA road database corrections. No on the ground changes.
Boulder	OMRD "activity discounts" for BY04 for Roads 2662 and 2207 are no longer applicable for BY05.
Grouse	OMRD increased because FS Road 215 (Gate 246) was breached in August and October of 2005. The lock was cut off and the gate had been opened, allowing an unknown amount of unauthorized use. The entire gate was pulled out of the ground in October, again, allowing an unknown amount of unauthorized use. Repairs were completed and law enforcement officers investigated. FS Employees monitored this gate during the first weekend of elk hunting (rifle) season to minimize further breaches.
North Lightning	OMRD and TMRD increased because FS Road 1054 (Boulder Barrier) was breached and unauthorized access noted out to the culvert crossing Bear Creek. Beyond this point the road is impassable.
Scotchman	No changes from bear year 2004.
SELKIRK RECOVERY ZONE	
Blue Grass	TMRD decreased by 3% as a result of the Boundary Creek Road (2450-FDR) decommissioning being completed in 2004. In addition, "barricaded" road 2466-FDR in the Blue Joe Creek drainage was modeled as "open" in BY04 as it was scheduled for decommissioning in the final road decommissioning phase (Phase IV) for the BlueGrass Bound project. Due to contractual difficulties, this road decommissioning work was never completed, but the 2004 baseline condition had this road in an "open" condition. Several short spur roads in the Blue Joe Creek drainage (2546UB, UE, UH) were also temporarily opened, and subsequently decommissioned, as part of the Blue Joe Creek cleanup effort in BY04. Roads 282A and 282C will be checked during the 2006 summer season to determine if barriers were installed. However, these roads are gated and they are thought to be "not drivable", therefore their contribution to TMRD is likely in error. These segments of road overlap with the Long-Smith BMU roads coverage and were reported in 2004 and 2005 as barricaded. To be consistent, their IGBC status has been changed from "2" gated to "3" barricaded in the Blue-Grass roads coverage. TMRD only decreased by 0.01% as a result of this change. OMRD improved from these activities.
Long-Smith	OMRD improved with closures on roads 2252 and 2251.
Kalispell-Granite	Gate on road # 2516 unintentionally left open, resulting in an increase in OMRD, however standard was still met.
Salmo-Priest	TMRD and Core improved with completion of two timber sales and the associated road closures (gates and berms put in place) as well as decommissioning roads 2220260 and 3155101.
Sullivan-Hughes	No actions causing changes from bear year 2004
Myrtle	INFRA roads database corrections based on filed validation for FS lands plus new information on private land road status. This caused OMRD to increase but still meets standard.
Ball-Trout	No actions causing changes from bear year 2004
Le Clerc	No standards set for this BMU due to low percent federal land. No on the ground activities done in 2005 that impacted road densities or existing core habitat. Corrections to INFRA road database increased TMRD.
Lakeshore	No actions causing changes from bear year 2004. Corrections to INFRA road database increased OMRD, but standard still met.

Table 27. BMU Monitoring Summary 2006

CABINET-YAAK RECOVERY ZONE	
Keno	Core*. % dropped from BY05 but no actual changes on the ground due to this model correction. Additional 1% decrease in core from discovery of open motorized trail from field verification.
Northwest Peak	Core*. % dropped from BY05 but no actual changes on the ground.
Boulder	Core increased as a result of field validation conducted during summer in 2006. Notable changes include: 2267-UC does not exist (change from restricted), 2701 & associated spurs and connected private roads in T61N,R2E,S17 are open & drivable (change from restricted & barrier), 314-UF & 314-UG are open & drivable(change from impassable/obstructed road), 2662-UD vegetation recovery (change from restricted), 2662-UA impassable/obstructed (change from restricted), and 2268 private (treat as open) up to Forest (BMU) boundary (change from restricted). Boulder BMU also affected by several changes to neighboring Grouse BMU (2260E, 2260F, 2616UB and 2616UC); OMRD unchanged; TMRD unchanged.
Grouse	Core: no increase in percent but minor acreage increase due to validation of FS Roads 2260E, 2260F, 2616UB and 2616UC. They were found to be impassable/obstructed roads resulting in an increase of ~13 acres of core. OMRD: net decrease due to no OMRD deduction needed this year for Road 215. Field validation of FS Roads 2260E, 2260F, 2616UB and 2616UC found each to be impassable or obstructed. FS Road 2636 was breached so OMRD deduction was taken; TMRD: unchanged with minor improvements due to above mentioned validation work.
North Lightning	Core decreased ~414 acres (temporary) due to breach of Road 1054. OMRD increased due to breach of Road 1054 and gate breach of Road 2641. TMRD unchanged from 2005 condition but up from 2004 due to Road 1054 breach. This fall Road 1054 was re-contoured to eliminate motor vehicle access.
Scotchman	No change from bear year 2005.
SELKIRK RECOVERY ZONE	
Blue Grass	Core decreased due to addition of 1.2 miles of open Road 2450 that had been overlooked for several years. These segments represent the portion of the Boundary Creek Road left on the landscape for public use (stable road prism with no hydrological concerns), but not updated on GIS layers. In addition, it has been suggested that Trail 308 (Upper Priest River trail) may be high use during the summer season. However, it is highly unlikely that the high amount of use extends the entire length of the trail. To acknowledge the possibility of high use periods, the first approximately 2.5 miles of the trail was buffered for core calculation purposes (it was assumed that use fell off relatively rapidly away from the trailhead, and by 2.5 miles in had declined to where it would no longer meet high use criteria). The end result of these "paper" changes was a 1% decrease in core for the BMU. OMRD "discounts" included Road 1009, 5.3 miles of Road 2253, 3.0 miles of Road 1011, and 4.5 miles of Road 636; as well as Road 2546 (Blue Joe). TMRD was unchanged.
Long-Smith	No change from bear year 2005.
Kalispell-Granite	Core unchanged but configuration changed due to decommissioning of Willow Creek road and newly created roads on Stimson land. Also, temporary impact due to the Plowboy Fire (<0.5% so whole % didn't change); OMRD unchanged and TMRD unchanged although configurations changed.
Salmo-Priest	Increase in TMRD due to mapping error.
Sullivan-Hughes	Decrease in TMRD and increase in core due to obliterating the entrance to Road 2200360 (previously a restricted road).
Myrtle	Core unchanged. OMRD decreased as a result of Road 2405 being discounted for hauling in 2005 but not needed in 2006 (reverted to 2004 condition). TMRD unchanged.
Ball-Trout	No change from bear year 2005.
Le Clerc	No change from bear year 2005.
Lakeshore	Core unchanged, OMRD decreased and unchanged. Roads 2231-FDR (~0.8 mile) and 308-UJ_PO (~0.1 mile) discovered this field season as being open/brushed out and drivable from the private ownership (change from gated). This impacted (loss) ~21 acres of core habitat but did not change the whole number reported. Roads behind Gate 111 (2516, 2231, 2242UI) did not receive an open road deduction this year which aided in a net decrease in OMRD from 81% in 2005 to 79% in 2006.

NOTE: On-going field validation of road status and INFRA road database cleanup may contribute to some change each year. Conditions on the ground do not necessarily change from the previous year.

Administrative Access

In 2005 there were no instances on the IPNF where administrative use exceeded the allowable seasonal use levels.

In 2006, there were four instances where administrative use exceeded the allowable seasonal use levels, including wildfire suppression activities associated with the Plowboy Fire on the Priest Lake RD. Only one of these roads exceeded the total administrative use levels for all seasons. In each of these cases, the road was considered open for compliance reporting. All roads where administrative use levels were exceeded are found in the Selkirk Recovery Zone.

Compliance Monitoring

Control points (e.g. gates) were monitored throughout the course of the active bear season, often multiple times, to determine extent of any unauthorized use on restricted and blocked roads. In 2005, open motorized road densities (OMRD) increased in the Kalispell-Granite and Grouse BMUs as a result of excessive, unauthorized motorized use. Unauthorized use also caused a conditional reduction in core and increase in total motorized road density (TMRD) in the North Lightning BMU.

In 2006, OMRD increased in the Grouse BMU as a result of excessive, unauthorized motorized use. Unauthorized use also caused a reduction in core and increase in TMRD in the North Lightning BMU.

Grizzly Bear Occupancy Areas Adjacent to the Cabinet-Yaak and Selkirk Recovery Zones (BORZ)

Due to the success of grizzly bear recovery plan implementation, expansion of grizzly bear populations beyond the boundaries of the existing recovery zones has occurred. Three such occupancy areas occur on the IPNF: 1) Deer Ridge; 2) Pack River; and 3) Priest. Effects to grizzly bear are addressed in these areas by the monitoring of linear open and total road densities. The intent of the linear open and total road density parameters is to reduce levels of incidental take to grizzly bear in occupied areas outside the recovery zones by ensuring there are no further increases in open and total road densities above baselines levels identified by the US Fish and Wildlife Service. In 2005 and 2006, both the linear open and total road density standards for all BORZ polygons were met (see the following tables)

Table 28. Linear Open and Total Road Densities by Bear Occupancy Polygon - 2005

BORZ Polygon	Linear ORD Standard (mi./sq.mi)	2005 Linear ORD on NF Lands (mi./sq.mi)	Linear TRD Standard (mi./sq.mi.)	2005 Linear TRD on NF Lands (mi./sq.mi.)
Deer Ridge	1.6	1.6	4.2	4.2
Pack River	0.6	0.6	7.8	7.8
Priest	5.0	5.0	2.6	2.6

Table 29. Linear Open and Total Road Densities by Bear Occupancy Polygon - 2006

BORZ Polygon	Linear ORD Baseline (mi./mi^2)	2006 Linear ORD on NF Lands (mi./mi^2)	Linear TRD Baseline (mi./mi^2)	2006 Linear TRD on NF Lands (mi./mi^2)
Deer Ridge	1.6	1.6	4.2	4.2
Pack River	0.6	0.6	7.8	7.8
Priest[1]	5.0	5.0	2.6	2.6

Forest Plan Monitoring Item F-3 Caribou Recovery

Background

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

Caribou are generally found in Engelmann spruce/subalpine fir and western redcedar/western hemlock forest types above 4,000 feet elevation in the Selkirk Mountains, but occasionally use valley bottom habitats in the Kootenai and Priest Lake Basins. Caribou are adapted to boreal forests and only occur in drier, low elevation habitats except as rare transients. Seasonal movements are complex. Caribou frequently cross the U.S. / Canada international border. Earlier in the 20th century, caribou were found 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, the highway system (subject to road kill), 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.

Monitoring

Wildfire

Numerous wildfires burned within caribou habitat during the 2006 fire season. Most of the fires remained small either naturally or as a result of wildfire suppression efforts and had little impact of caribou habitat conditions and habitat availability. The Hughes 32 fire complex located on the northern portion of the Idaho Panhandle National Forests impacted approximately 4,364 acres within the caribou recovery area.

Of the total area impacted within the caribou recovery area, 3,187 acres of habitat which was considered as either capable or as suitable habitat were negatively impacted. The remainder of the burned area, which totaled 1,177 acres was not considered caribou habitat because of steep slopes, rocky terrain, and other contributing factors.

Census

Caribou census efforts are conducted annually in cooperation with Idaho Department of Fish and Game, USDA Forest Service, British Columbia Ministry of Environments and the British Columbia, Columbia Basin Fish and Wildlife Compensation Project. Surveys are generally conducted between February and March of each year using a combination of fixed wing and rotary winged aircraft. In 2005, the annual census placed the South Selkirk caribou population at an estimated 35 animals, which was an increase from 33 animals the previous year. Two animals were located within the United States portion of the recovery area that winter. Because of weather conditions that winter during the census, the population estimate of 35 animals is considered as a minimum estimate.

In 2006, the census placed the caribou population at an estimated level of 38 animals, with all but one animal located within the United States portion of the recovery area. This indicated a possible slight increase in the population from the previous year.

Monitoring

Since 2003, monitoring of snowmobile use within the Selkirk Ecosystem was undertaken during the winter months. The purpose was to verify existing snowmobile use areas and to identify any changes in snowmobile use regarding spatial distribution and compliance with existing snowmobile closure areas and to monitor caribou use areas. A technique used involves the use of a fixed wing aircraft and flying at an altitude which observers would be able to distinguish snowmobile tracks from the air. To accurately identify the location of snowmobile activity additional equipment included a portable laptop computer with mapping software and a portable global positioning system (GPS) device. Computer mapping was done in a real-time mode which allowed accurate location of closure areas and vehicle or animal tracks. The ability to visually detect tracks from the air was dependant on snow conditions such as the time since the last snowfall, snow hardness and light conditions.

Four aerial flights to monitor caribou traffic and snowmobile use within the caribou recovery area were taken in 2006. The flights were on February 10, February 25, March 13 and May 9, 2006. Information from aerial flights was used to focus enforcement efforts when and where applicable and to identify additional signage and informational needs regarding areas closed to winter snowmobile use.

Lichen monitoring

Lichen monitoring was undertaken within the Grassy-top Timber Sale as specified within the environmental assessment. This monitoring was undertaken to assess the impacts from light timber harvest on arboreal lichen species which are an important species for woodland caribou. Monitoring was designed to detect the effects of light timber thinning regimes on stand lichen loading and lich availability within caribou habitat. Monitoring was conducted on seven year intervals, with 2005 being the third monitoring interval. The monitoring technique used a combination of 1 meter fixed plot to determine lich loading and a variable plot to determine lichen availability using the technique outlined by Susan Stevenson. The determination to date indicated the light timber removal within this stand only slightly affected the overall lichen loading, whereas lichen availability was decreased initially from post harvest, likely due to mechanical damage and small tree removal. Monitoring for year fourteen revealed that lichen species Bryoria spp. has increased in relative abundance since timber harvest occurred.

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

The requirement to monitor fry emergence success was removed from the forest plan via a forest plan amendment in 2005 (see *Fry Emergence Amendment Decision Notice and Finding of No Significant Impact*, June 2005 at http://www.fs.fed.us/ipnf/eco/manage/forestplan/index.html#fpamnd).

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 2005 and 2006.

Water Quality and Water Resource Monitoring is intended to demonstrate that actions and practices are *implemented as designed* (implementation monitoring), are *functioning as effectively as intended* in controlling non-point sources of pollution (effectiveness monitoring), and are *achieving the objectives* of protecting water quality and beneficial uses as assumed (validation monitoring). The primary purpose of BMP monitoring is to demonstrate that BMPs (and the forest's *Soil and Water Conservation Practices*) are functioning as effectively as intended. If they do not adequately demonstrate effectiveness, then the practices may be re-evaluated and redesigned as necessary. Implementation and effectiveness monitoring on the forest during 2005 and 2006 demonstrated that present and past projects were usually successful in meeting their intended objectives (see section K-1 for BMP monitoring results).

Since the watershed simulation program, WATSED continues to be used in project planning as one of the many tools to assist managers and watershed specialists to evaluate potential response and alternatives; G-2 also requires ongoing validation checks and calibration adjustments as necessary. Skookum Creek (St. Joe Ranger District) was analyzed for this report. In addition, all databases were updated with the data collected from the operational Forest Plan Monitoring gages through 2006.

WATSED Validation Monitoring

Skookum Creek is an 11 square mile watershed that drains into the St. Joe River. Human activities in this watershed were limited to a small amount of logging and road building from 1962-1966. The gauging station was established in 1980 and data collected at this site includes water level, stream flow, bedload and suspended sediment. The site is a baseline monitoring station. Baseline stations are long-term sites that were established to provide information on the natural processes, functions, and variability of steams and watershed systems over time. Some baseline sites also are a control to compare to other watersheds with similar climatic, physical, and hydrologic character, to help determine what may have occurred naturally versus through management activities (Appendix JJ, IPNF Forest Plan, Amendment No. 1). Skookum Creek is a control that is paired with Bird Creek. Analysis of Bird Creek data is expected to be presented in the 2007 IPNF monitoring report.

Table 30. Skookum 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"	16.2	273		70.1		39	
area (mi2)	11.1						
1988		281	79	70.3	78	39	51
1989		281	74	70.4	124	39	38
1990		281	70	70.4	86	39	73
1991		281	89	70.3	142	39	41
1992		281	78	70.3	94	39	31
1993		281	90	70.3	139	39	28
1994		281	74	70.3	89	39	26
1995		281	85	70.3	86	39	57
1996		281	276	70.3	114	39	57
1997		281	752	70.3	232	39	31
1998		281	745	70.3	106	39	31
1999		281	689	70.3	154	39	26
2000		281	294	70.3	152	39	54
2001		281	294	70.3	114	39	27
2002		281	201	70.3	165	39	31
2003		281	120	70.3	84	39	30
2004		281	115	70.3	106	39	49
2005		281	57	70.3	95	39	31
2006		281	64	70.3	123	39	33
	averages	281	243	70.3	121	39	40
	per mile^2	25.3	21.9	6.3	10.9		

In Skookum Creek, there were substantial differences between estimated sediment delivered from the WATSED model and measured total sediment yields. The divergence could be related to overestimates by WATSED, or from sampling errors related to inadequate timing or frequency of bedload measurements. The general pattern of overestimation of sediment is consistent with comparisons in other baseline watersheds (2003 IPNF Monitoring and Evaluation Report). The stream flow estimates from WATSED and measured flows were somewhat more consistent, although WATSED generally underestimated flow for Skookum Creek.

Forest Plan Monitoring Item G-4: Fish Population Trends

Threshold: Downward trend

Reporting Period: 2 years

The following are goals in the 1987 Forest Plan 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), the Forest Service conducts 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.

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 greatest conservation need" by the State of Idaho in their Comprehensive Wildlife Conservation Strategy. 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. By court order, the USFWS was directed to reconsider the decision that listing of westslope cutthroat trout was not warranted. On August 8, 2003 the USFWS again affirmed the decision that listing of westslope cutthroat trout was not warranted.

General Population Trends of 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 and St. Joe basins show that bull trout populations are stable and increasing (Figures 4 and 5, respectively), while populations in the Priest basin appear to be declining overall (Figure 6). Bull trout appeared to be increasing in the Little North Fork Clearwater River (DuPont and Horner 2006).

General Population Trends of Westslope Cutthroat Trout

Population trend data from Idaho Fish and Game snorkel counts show that cutthroat trout populations in the North Fork Coeur d'Alene River basin appear to be increasing (Figure 7). Snorkeling surveys in the Little North Fork Clearwater River appear to show an upward trend (DuPont and Horner 2006).

Figure 4. Total bull trout redd counts by year for all sites and for the six index streams (Trestle, EF Lightning, Gold, North Gold, Johnson, and Grouse Creeks) in the Pend Oreille watershed

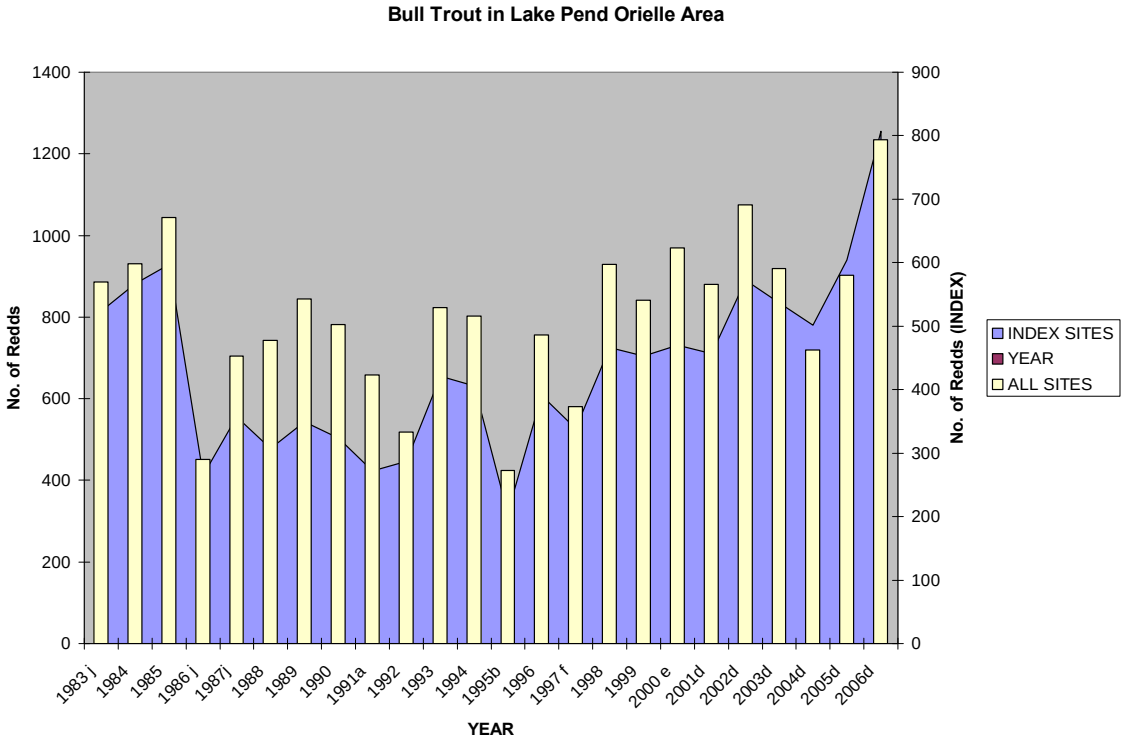


Figure 5. Data from St. Joe Index Streams (Medicine Creek, Wisdom Creek, St. Joe river from Heller to St. Joe Lake) (Data courtesy of IDFG)

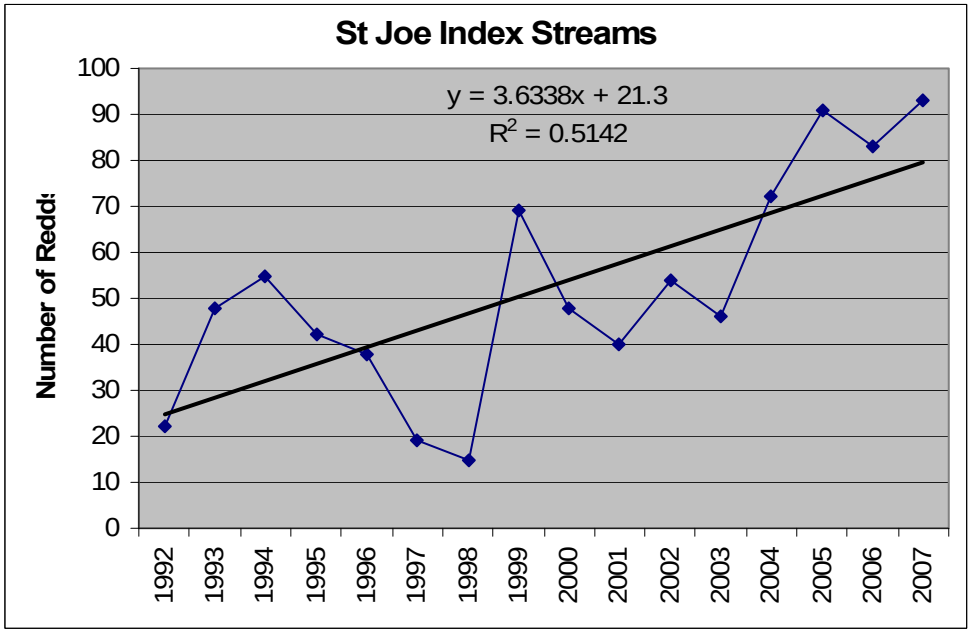
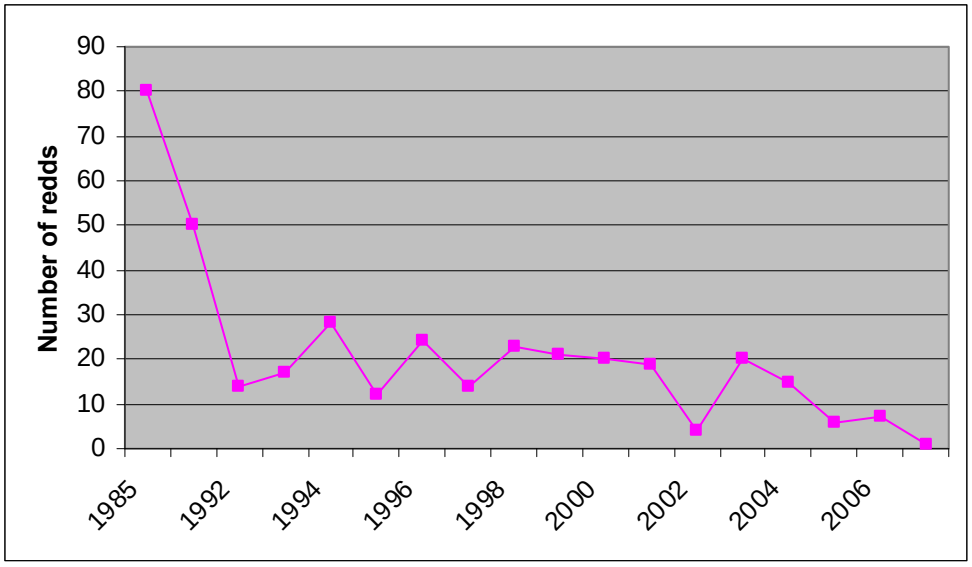


Figure 6. Total number of redds in nine consistently counted stream segments (including Lime, Cedar, Hughes, Bench, Gold, Trapper Creeks and Upper Priest River) in the Upper Priest Lake drainage (Idaho Department of Fish and Game)



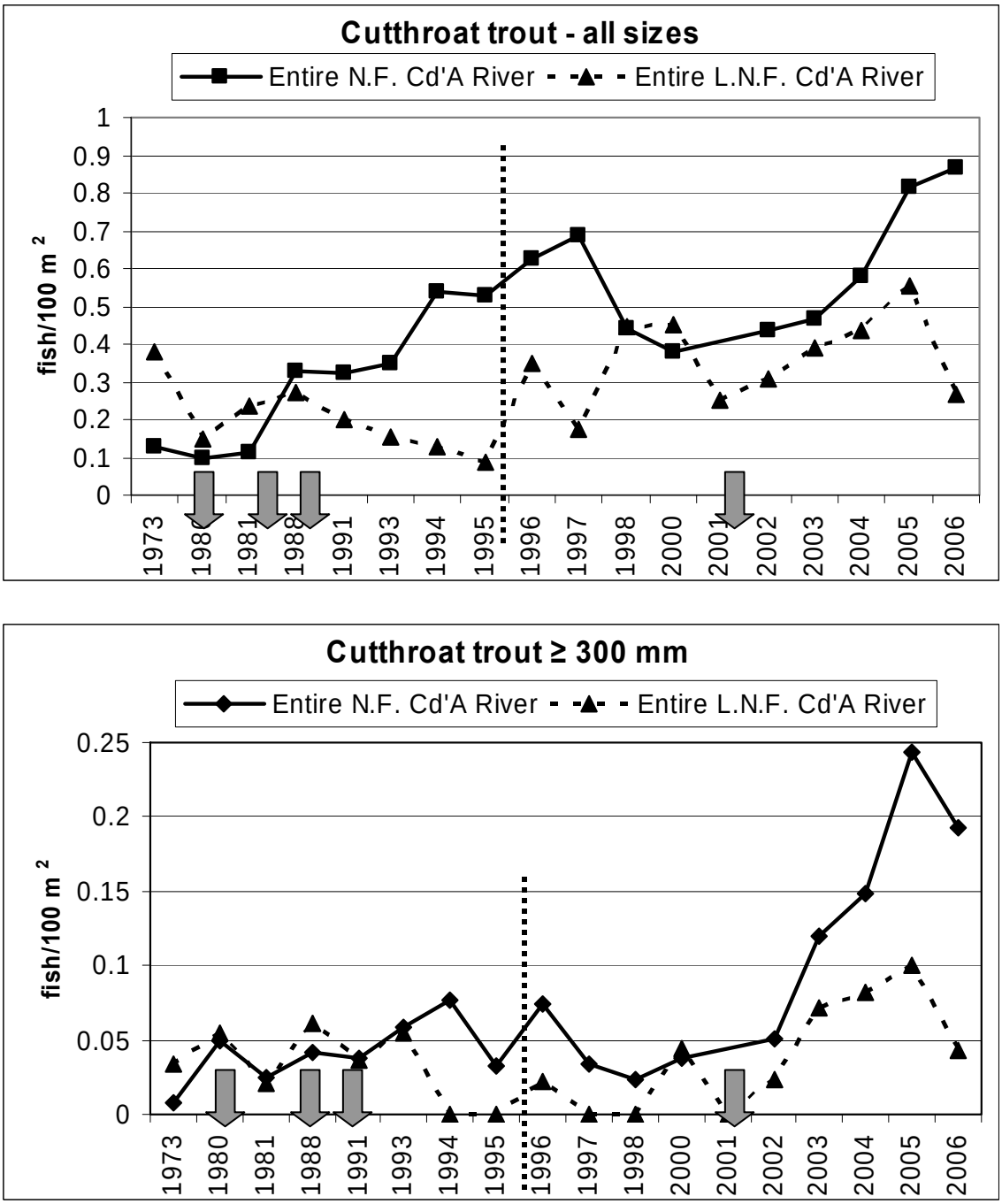
Coeur d'Alene River Ranger District (Central Zone)

The following is trend data collected on the Coeur d'Alene River Ranger District for the North Fork (N.F.) Coeur d'Alene River and tributaries to two smaller streams where restoration work has been completed. Data collected on the N.F. Coeur d'Alene River and tributaries was taken from Idaho Department of Fish and Game - Region 1 snorkel surveys (1973-2006). Data from the two smaller restored streams (Jordan Creek and Yellowdog Creek) was collected by USDA Forest Service personnel on the Coeur d'Alene River RD or taken from thesis work completed by Dunnigan (1997) or Abbot (2000).

1) N.F. Coeur d'Alene River and tributaries

Monitoring within the N.F. Coeur d'Alene River and tributaries by the Idaho Department of Fish and Game has provided some significant trend data on westslope cutthroat trout populations within the basin for the last 30 years (Figure 7). A total of 43 transects in the N.F. Coeur d'Alene River were snorkeled to estimate salmonid abundance and approximate size distribution. Mean densities of cutthroat trout age 1+ were 0.79 fish/100 m^2 and cutthroat trout $\geq$ 300 mm in length were 0.18 fish/100 m^2 in the N.F. Coeur d'Alene River. Westslope cutthroat trout represented by size $\geq$ 300 mm in length in the N.F. Coeur d'Alene River represented 23% of the total westslope cutthroat trout. The N.F. Coeur d'Alene River showed an increasing trend in abundance of cutthroat trout following the decline observed after the 1996 and 1997 flood events. Record high densities were observed for the second year in a row in 2006. In addition, densities and abundance of westslope cutthroat trout $\geq$ 300 mm showed an increasing trend, where observed densities in 2006 were the second highest ever (DuPont et al. 2006, unpublished regional report). An ANOVA statistical evaluation of westslope cutthroat trout $\geq$ 300 mm showed that densities were significantly different (p-value < 0.001) between stream reaches. A Fisher's LSD test showed that densities in the catch-and-release areas of the N.F. Coeur d'Alene River tended to be significantly higher than densities in all other stream reaches (Dupont et al. 2006, unpublished regional report).

Figure 7. The average density (fish/100 m^2) of all size classes of cutthroat trout and cutthroat trout ≥ 300 mm observed while snorkeling transects in the N.F. Coeur d'Alene River (N.F. Cd'A) and Little N.F. Coeur d'Alene River (L.N.F. Cd'A), Idaho, from 1973 to 2006*



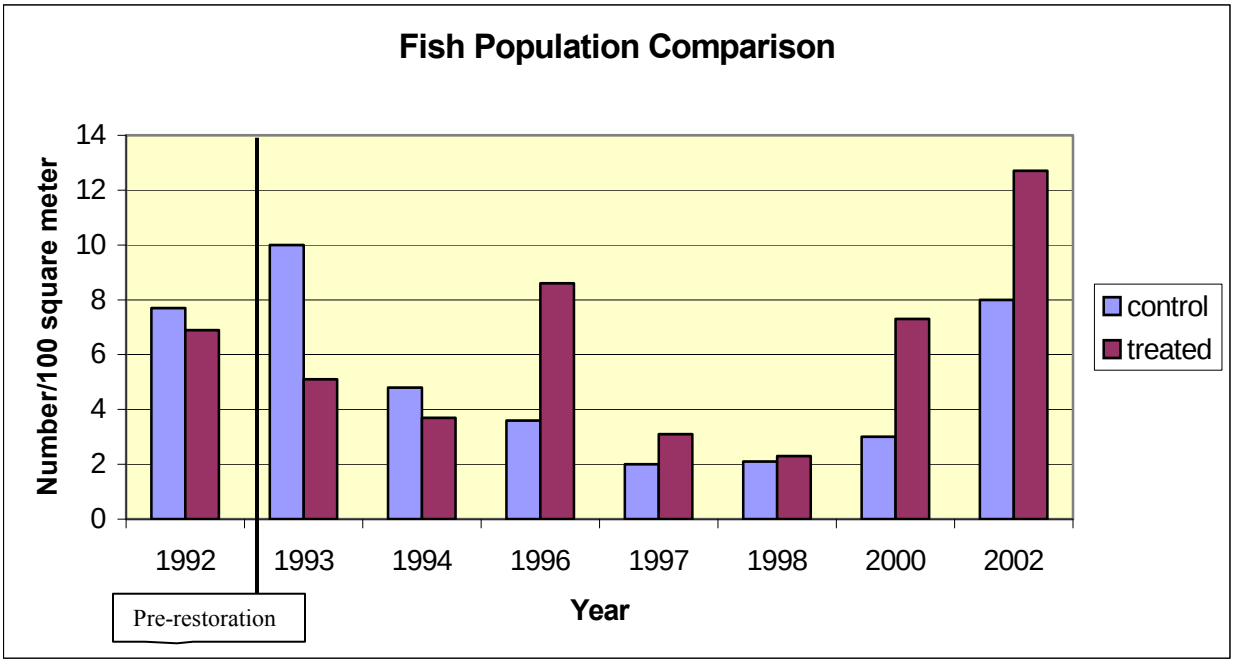
*Arrows show when significant changes occurred in the cutthroat trout fishing regulations. Dotted line indicates when significant road restoration began and road construction was significantly reduced.

2) Jordan Creek Restoration – Fish Monitoring

Restoration work was completed within Jordan Creek in 1992 and long term monitoring has been conducted intermittently since then. Average fish populations were determined by electrofishing eight transects, where four transects were located in the untreated (control) section and four were located within the treated (restored) reach (Figure 8). Transects varied in length from 118 to 180 meters, standardized for #fish/100m^2, and encompassed a variety of fish habitat. The depletion method was used to estimate fish numbers, where two to three passes were done at each transect.

A comparison of fish populations was conducted evaluating the treated (restored) and untreated (control) sections of Jordan Creek. The species of fish found were westslope cutthroat trout, sculpin (*Cottus spp.)*, and longnose dace (*Rhinichthys cataractae*). Westslope cutthroat trout were selected as the indicator species to evaluate population changes over time. Microfish 3.0 (Van Deventer and Platts, 1989) software was used to determine fish densities (Figure 8). In 1992 no treatment occurred and averages were very similar in both areas. The general trend from 1993 – 1997 showed a gradual decrease in fish densities in the control sections of the stream. On February 9th, 1996, the basin experienced a 100-year flood event. The 1996 fish population sampling was conducted after the flood; the trend in cutthroat densities shows a continued decrease in the control section but an increase in the treated section. This increase was attributed to a single large pool, which was constructed by the project. This pool had accumulated a number of large logs and was very complex. Most of this wood had moved by 1998. We saw increases in population in both sections from 2000-2002, although the treated transects had higher populations.

Figure 8. Westslope cutthroat trout (*O. clarki lewisi*) fish population comparison between treated and control reaches with in Jordan Creek watershed, Coeur d'Alene River Idaho from 1992 to 2002

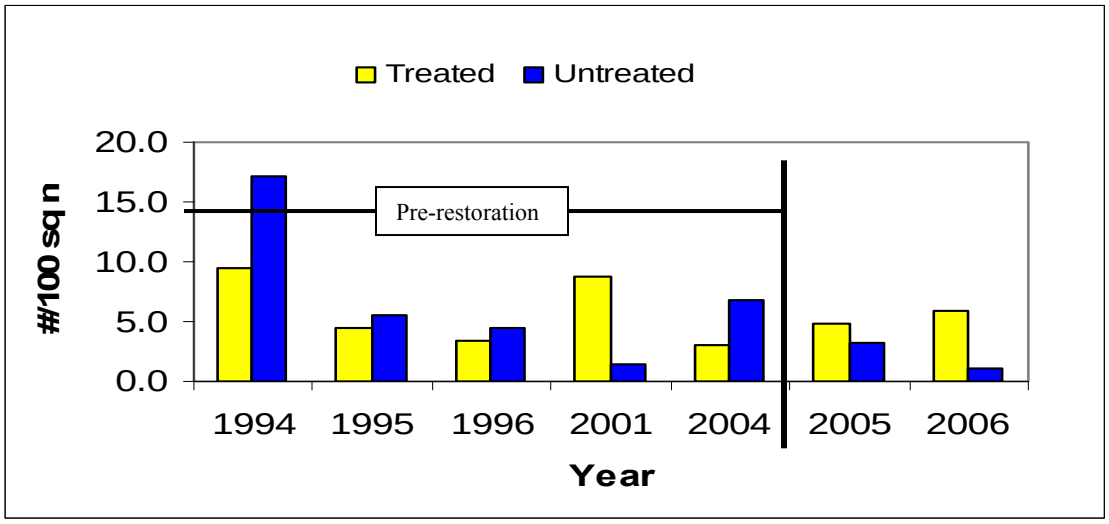


3) Yellowdog Creek Restoration – Fish Monitoring

Restoration work was completed within Yellowdog Creek in 2005. An examination of previous fish population surveys within the basins revealed sporadic surveys for the past 7 years (Figure 9).

There are no discernible trends in the abundance estimates for Yellowdog Creek for the years surveyed. The gaps in data collection (1997-2000 and 2002-2003) make it difficult to determine trend pre-restoration. Continued monitoring will be required to determine population trends post-restoration.

Figure 9. Westslope cutthroat trout abundance comparison between the treated and untreated channel areas for seven different years in Yellowdog Creek, Coeur d'Alene River, Idaho



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

The relative population health of listed (bull trout) and management indicator (westslope cutthroat trout) fish species have been examined for years 2005 and 2006. Trends in the health of these fish species are analyzed to determine the current extent of risk to species' conservation within the context of current land management.

Bull trout populations are tracked annually by Idaho Department of Fish & Game across the Forests by the amount of reproduction. Redd counts are used as the metric to determine the amount of reproduction and are best if used only to document the trend in the population size. Data have been collected for the Lake Pend Oreille, Priest River Basin, and Kootenai River populations.

Westslope cutthroat trout populations are examined through less extensive means and survey sites do not indicate basin-wide population trends. Relative abundances and catch per unit efforts have been gathered from electrofishing and night-time snorkel surveys. Surveys were performed principally for project-specific analyses and to a lesser extent for fisheries management decisions related to native fish conservation (e.g., removal of fish passage barriers). Data have been collected within the Priest River basin for Granite Creek, Hughes Fork (Upper Priest River), the Upper West Branch of the Priest River, and the Lower West Branch of the Priest River. In the Pend Oreille basin, data were collected for Tumbledown Creek, North Fork and South Fork Twin Creek, Canyon Creek, and Cedar Creek.

A) Bull Trout

1) Lake Pend Oreille System (Sandpoint and Priest Lake RD)

Bull trout redd counts have been conducted in the Pend Oreille basin since 1983 (Table 31). Based on this information, the overall trend in status of bull trout populations in the Pend Oreille appears to be stable and may be increasing based upon the total data as well as the data from the six sites used by IDFG as index sites (Figure 4). Through tagging and migration studies it was determined that bull trout in the East Fork Priest River population were connected to Lake Pend Oreille; therefore, redd counts from those tributaries are included in the Lake Pend Oreille system data.

Table 31. Number of bull trout redds counted per stream in the Lake Pend Oreille drainage, Idaho, 1983-2006 (Downs and Jakubowski 2007)

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]	2004[d]	2005[d]	2006[d]
CLARK FORK R.	--	--	--	--	--	--	--	--	--	2	8	17	18	3	7	8	5	5	6	7	8	1	--	3
Lightning Cr.	28	9	46	14	4	--	--	--	--	11	2	5	0	6	0	3	16	4	7	8	8	9	22	9
East Fork	110	24	132	8	59	79	100	29	--	32	27	28	3	49	22	64	44	54	36	58	38	77	50	51
Savage Cr.	36	12	29	--	0	--	--	--	--	1	6	6	0	0	0	0	4	2	4	15	7	15	7	25
Char Cr.	18	9	11	0	2	--	--	--	--	9	37	13	2	14	1	16	17	11	2	8	7	14	15	20
Porcupine Cr.	37	52	32	1	9	--	--	--	--	4	6	1	2	0	0	0	4	4	0	0	5	10	14	8
Wellington Cr.	21	18	15	7	2	--	--	--	--	9	4	9	1	5	2	1	22	8	7	7	8	7	6	29
Rattle Cr.	51	32	21	10	35	--	--	--	--	10	8	0	1	10	2	15	13	12	67	33	37	34	34	21
Johnson Cr.	13	33	23	36	10	4	17	33	25	16	23	3	4	5	27	17	31	4	34	31	0	32	45	28
Twin Cr.	7	25	5	28	0	--	--	--	--	3	4	0	5	16	6	10	19	10	1	8	3	6	7	11
Morris Cr.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	1	0	7	1	1	3	16
Strong Creek	--	--	--	--	--	--	--	--	--	--	--	--	--	2	--	--	--	--	--	0	--	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	102	174	395
Pack River	34	37	49	25	14	--	--	--	--	65	21	22	0	6	4	17	0	8	28	22	24	31	53	44
Grouse Cr.	2	108	55	13	56	24	50	48	33	17	23	18	0	50	8	44	50	77	18	42	45	28	77	55
EAST SHORE																								
Granite Cr.	3	81	37	37	30	--	--	--	--	0	7	11	9	47	90	49	41	25	7	57	101	149	132	166
Sullivan Springs	9	8	14	--	6	--	--	--	--	0	24	31	9	15	42	10	22	19	8	15	12	14	15	28
North Gold Cr.	16	37	52	8	36	24	37	35	41	41	32	27	31	39	19	22	16	19	16	24	21	56	34	30
Gold Cr.	131	124	111	78	62	111	122	84	104	93	120	164	95	100	76	120	147	168	127	203	126	167	200	235
West Gold	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4
PRIEST RIVER																								
M.F. East River	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4	8	21	20	48	71
Uleda Creek	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	4	3	7	4	7
N.F. East River	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	0	0
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	462	580	794
Total of all streams	814	881	930	412	555	478	543	503	423	447	656	631	320	610	527	726	705	732	710	890	836	781	940	1256

[a]Represents partial counts due to early snow fall (E. Fk. Lightning not included in index count)
[b]Observation conditions impared by high runoff in all streams except Sullivan Spings, 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, 2 in 2003, 5 in 200
[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 Prat
[k] observation conditions impaired by high water in Trestle Creek.
[L] large early spawning kokanee made it difficult to distinguish bull trout redds from kokanee redds in Sullivan Springs.
[m] observation impaired by high water in Uleda and Savage creeks.

2) Priest Lake System

Bull trout redd counts have occurred sporadically in the mainstem and tributaries to the Upper Priest River watershed (Table 32). There has been a downward trend over time in this watershed, as indicated by the data from stream reaches were redd counts have consistently occurred (Figure 6). Data is not collected on tributaries to the main lake so occasional bull trout redds observed are not reported here.

Table 32. Number of bull trout redds counted per stream in the Upper Priest Lake basin, Idaho, 1985-2006 (data courtesy of Idaho Department of Fish and Game)

Stream	Transect Description	Length (km)	1985	1986	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Upper Priest	Falls to Rock Cr.	12.5	--	--	--	--	--	--	15	4	15	33	7	7	17	8	5	13	21
	Rock Cr. to Lime Cr.	1.6	--	--	--	2	1	1	2	0	3	7	0	2	0	0	0	0	1
	Lime Cr. to Snow Cr.	4.2	12[a]	5[a]	--	3	4	2	8	1	10	9	9	5	1	16	12	3	4
	Snow Cr. to Hughes Cr.	11.0	--	--	--	0	0	--	0	3	7	4	2	8	3	13	2	10	0
	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	--	1	0	0
Lime Cr.	Mouth upstream 1.2 km	1.2	4[b]	1[b]	0	0	--	--	0	2	0	1	0	0	0	0	0	0	0
Cedar Cr.	Mouth upstream 3.4 km	3.4	--	--	--	0	2	1	0	1	0	0	0	0	0	0	0	0	0
Ruby Cr.	Mouth to waterfall	3.4	--	--	0	0	--	--	--	0	0	--	--	--	0	--	--	0	--
Hughes Cr.	Jackson Cr. to trail 312	2.5	1	17	7	3	2	0	1	4	0	1	0	0	0	1	0	0	0
	F.S. road 662 to Jackson Cr.	4.0	35[c]	2[c]	2	0	7	1	2	0	0	0	0	0	0	1	2	1	1
	F.S. road 662 to mouth	7.1	4[d]	0[d]	--	1	--	--	2	3	1	0	2	6	1	0	1	1	1
Bench Cr.	Mouth upstream 1.1 km	1.1	1	2	0	2	2	0	1	0	0	0	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	0	0	1
Gold Cr.	Mouth to Culvert	3.7	24	23	5	2	6	5	3	0	1	1	9	5	2	2	0	1	0
Boulder Cr.	Mouth to waterfall	2.3	--	--	0	0	0	--	0	0	0	--	0	--	--	--	--	0	--
Trapper Cr.	Mouth upstream 0.8 km upstream	5.0	--	--	--	4	4	2	5	3	8	2	0	1	0	0	0	0	--
Caribou Cr.	Mouth to old road crossing	2.6	--	--	--	1	0	0	0	0	0	--	--	--	--	--	--	--	--
All stream reaches combined		70.5	80[e]	50[e]	18	18	28	12[f]	41	22	45	58	29	34	24	41	23	29	29
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	15	6	6

[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.

Fish population monitoring surveys performed in 2005 and 2006 at Priest Lake found no presence of bull trout (see Figures 10, 11, and 12).

3) Kootenai River System

In Idaho, only Callahan Creek and Boulder Creek are surveyed for bull trout redds, and only since 2002, which is insufficient data to determine meaningful trends (Table 33). Most tributaries to the Kootenai River in Idaho have natural migration barriers within the first 2+ kilometers of the confluence. Bull trout have been observed over the years or are thought to occur in the lowest reaches of Deep, Caribou, Snow, Myrtle, Long Canyon, and Boundary creeks but densities are low.

Table 33. Number of bull trout redds observed in the Kootenai River system in Idaho, 2000-2006 (Walters 2006; Idaho Department of Fish and Game)

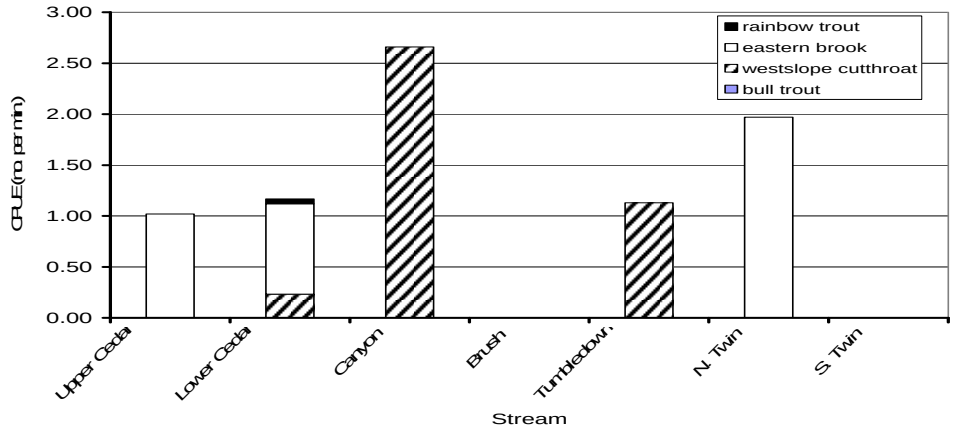
Stream	Length (km)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
IDAHO																		
North Callahan Creek	3.3	--	--	--	--	--	--	--	--	--	--	--	--	13	30	17	12	29
South Callahan Creek	4.3	--	--	--	--	--	--	--	--	--	--	--	--	4	10	8	8	4
Boulder Creek	1.8	--	--	--	--	--	--	--	--	--	--	--	2	2	0	0	1	0

B) Westslope Cutthroat Trout

1) Lake Pend Oreille System

Electrofishing surveys in seven tributaries to Lake Pend Oreille during the 2005 field season showed some streams' fish assemblage dominated by westslope cutthroat trout, while others were dominated by brook trout (Figure 10).

Figure 10. Relative abundance of fish species sampled in some tributaries in the Lake Pend Oreille basin in 2005



2) Priest River System

Electrofishing surveys in 2005 and 2006 were concentrated in stream segments where isolated populations of westslope cutthroat trout were observed in the past. Sites included North Fork Granite Creek above Granite Falls, Lunar Creek (UWB) above the culvert on Road 1107, South Fork Gold Creek above Road 1382, and North Fork Gold Creek above Road 1013. Muskegon Creek has westslope cutthroat trout, but there is some introgression with rainbow trout due to Washington Department of Fish and Wildlife having stocked Muskegon Lake with rainbow trout in the past. Westslope cutthroat trout dominated the fish assemblage at some sites (e.g., Muskegon, NF Granite, NF Gold, SF Gold, and Lunar) but were absent in others, that were instead dominated by eastern brook trout (Figures 11 and 12).

Figure 11. Relative abundance of fish species sampled in some tributaries in the Priest River basin in 2005

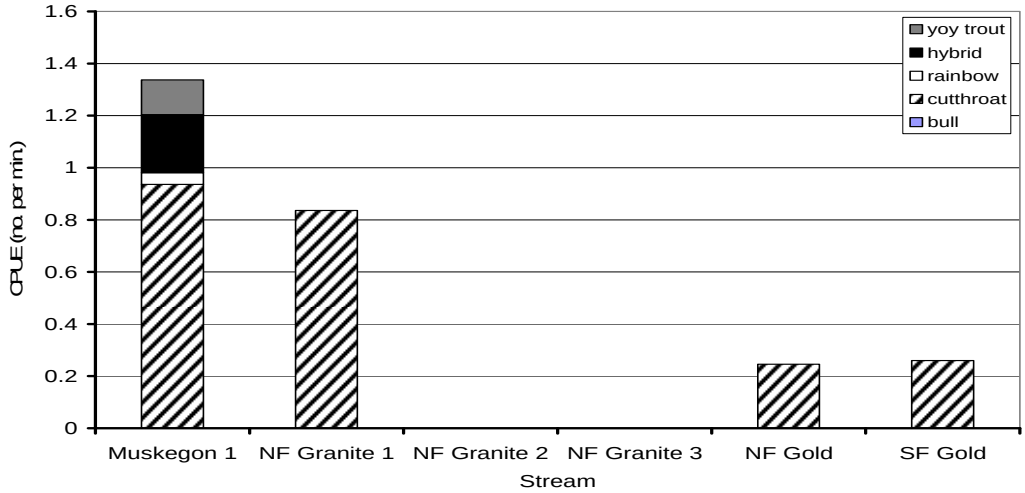
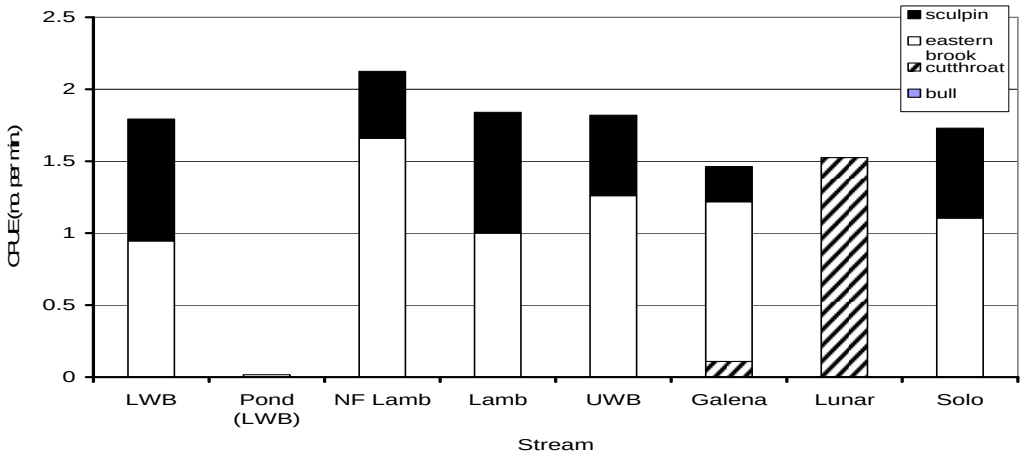


Figure 12. Relative abundance of fish species sampled in some tributaries in the Priest River basin in 2006



St. Joe Ranger District (South Zone)

A) Bull Trout

Bull trout redd counts have occurred in the upper St. Joe River and tributaries since 1992, continually in three index streams (Medicine Creek, Wisdom Creek, St. Joe river from Heller to St. Joe Lake) from 1995 (Table 34). Redd counts have been conducted in the Little NF Clearwater River and tributaries since the mid 1990s (Table 35).

Table 34. Bull trout redd counts in the St. Joe River and tributaries (data courtesy of Idaho Department of Fish and Game)

Stream Name	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Aspen Cr.	--	--	--	--	--	--	--	--	--	--	0	--	--	--	--
Bacon Cr.	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bad Bear Cr.	--	0	0	--	--	--	--	--	--	--	--	0	--	--	--
Bean Cr.	14	--	--	0	--	--	--	--	--	--	--	--	--	--	--
Beaver Cr.	2	2	0	0	0	0	1	0	--	0	0	0	0	0	0
Bluff Cr.- East Fork	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
California Cr.	2	4	0	2	3	0	--	--	0	0	0	0	0	0	0
Copper Cr.	--	--	0	--	0	--	--	--	--	--	0	0	0	--	--
Entente Cr.	--	--	--	--	--	--	--	0	--	--	1	0	--	--	--
Fly Cr.	1	--	--	0	0	0	2	0	--	--	1	0	0	0	--
Gold Cr. Lower mile	--	0	--	--	--	0	--	0	--	--	--	0	--	--	--
Gold Cr. Midde	--	--	--	0	--	--	--	0	--	--	--	--	--	--	--
Gold Cr. Upper	--	2	--	--	1	1	0	--	--	--	--	--	--	--	--
Gold Cr. All	--	--	--	--	--	--	--	--	--	1	0	--	0	--	--
Heller Cr.	0	0	0	0	--	1	0	0	0	--	0	0	7	1	5
Indian Cr.	0	0	--	--	--	--	--	--	--	--	--	--	--	--	--
Medicine Cr. (IDFG)	11	33	48	17	23	13	11	48	43	16	42	28	52	62	71
Mosquito Cr.	0	--	0	0	4	0	2	--	--	--	--	--	0	0	--
Quartz Cr.	--	--	--	--	--	--	--	--	--	--	0	--	--	--	--
Red Ives Cr.	--	0	1	1	0	1	0	0	0	0	0	0	0	1	0
Ruby Cr.	0	1	--	8	--	--	--	--	--	--	--	--	--	--	--
Sherlock Cr.	0	3	0	2	1	1	0	1	0	--	--	0	0	0	0
Simmons Cr. - Lower	--	0	0	0	--	--	--	--	--	0	--	--	--	--	--
Simmons Cr. - NF to Three Lakes	--	5	0	--	--	--	--	--	--	--	--	--	--	--	0
Simmons Cr. - Three Lakes to Rd 1278	--	3	5	5	0	0	0	0	--	--	--	--	--	--	0
Simmons Cr. - Rd 1278 to Washout	--	0	0	0	1	0	1	0	--	--	--	--	--	--	--
Simmons Cr. - Upstream of Washout	--	0	--	--	--	0	--	--	--	--	--	--	--	--	--
Simmons Cr. - East Fork	--	--	0	--	--	--	--	--	--	--	--	--	--	--	--
St. Joe River - below Tento Creek	--	--	--	--	0	--	--	--	--	--	--	--	--	--	--
St. Joe River - Spruce Tree CG to St. J. Lodg	--	--	--	0	--	--	--	--	--	--	--	--	--	--	--
St. Joe River - St. Joe Lodge to Broken Leg	--	--	--	4	--	--	--	--	--	--	--	--	--	--	--
St. Joe River - Broken Leg Cr upstream	--	--	--	0	--	--	--	--	--	--	--	--	--	--	--
St. Joe River - Bean to Heller Cr.	0	0	--	--	--	--	--	--	--	--	--	--	--	--	--
St. Joe River - Heller to St. Joe Lake	10	14	3	20	14	6	0	10	2	11	3	9	9	10	0
Three Lakes Creek	--	--	--	--	0	--	--	--	--	--	--	--	--	--	--
Timber Cr.	--	0	1	0	--	--	--	--	--	--	--	--	--	--	--
Wampus cr	--	0	0	--	--	--	--	--	--	--	--	--	--	--	--
Washout cr.	--	3	0	0	0	0	--	--	--	--	--	--	--	--	--
Wisdom Cr	1	1	4	5	1	0	4	11	3	13	9	9	11	19	12
Yankee Bar	1	0	--	--	--	0	--	--	1	0	0	0	0	0	3
Total - Index Streams	22	48	55	42	38	19	15	69	48	40	54	46	72	91	83
Total - All Streams	42	71	62	64	48	23	21	70	49	41	56	46	79	93	91
Number of streams counted	16	23	19	21	16	17	12	13	8	9	14	14	13	11	11

Table 35. Number of bull trout redds counted per stream in the Little North Fork River drainage, Idaho from 1994 to 2006. Numbers in parentheses indicate redds smaller than 300 mm in diameter (data courtesy of Idaho Department of Fish and Game)

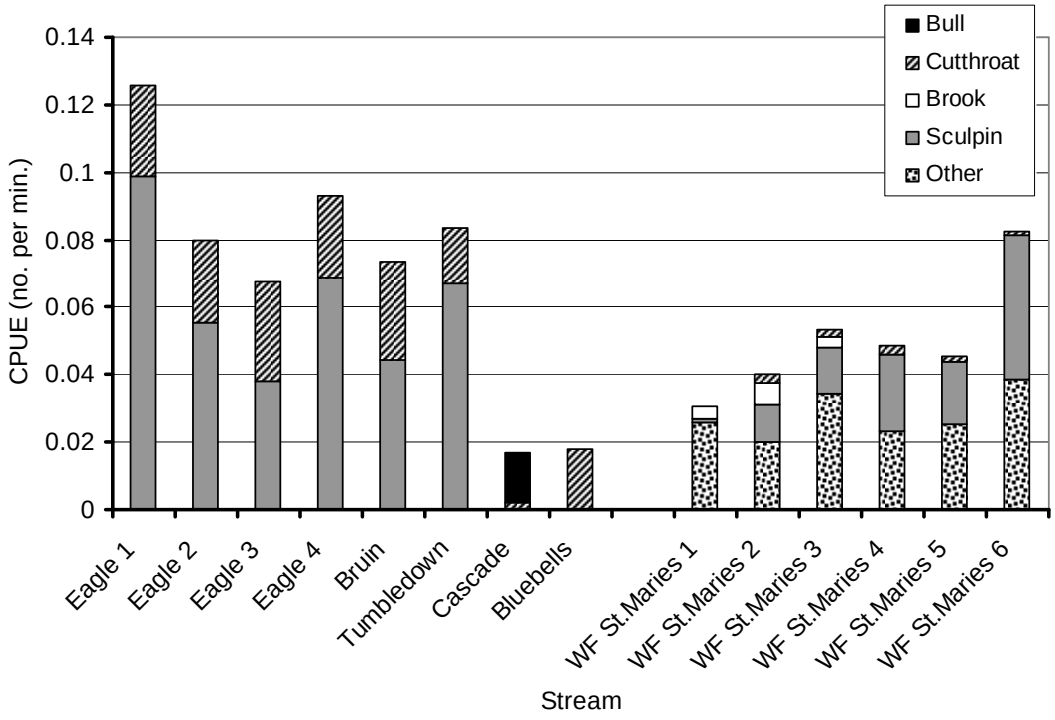
Stream	Length (km)	1994[a]	1996	1997	1998	1999	2000	2001	2001[b]	2002	2003	2004	2005	2006
Buck Creek	4.8	--	--	--	--	--	--	--	--	--	5	--	--	--
Canyon Creek	5.5	--	--	--	--	--	--	--	--	--	0	--	--	--
Butte Creek	1.2	--	--	--	--	--	--	--	5	0	--	--	--	--
Rutledge Creek	2.9	--	--	--	--	--	--	--	--	--	1	1	6	0
Rocky Run Creek	4.7	--	--	--	--	--	--	--	--	5	1	3	21	13
Lund Creek	3.9	0	7	2	2	1	1	13	5	7	7 (1)	5	19	7
Little Lost Lake Creek	3.9	0	1	1	1	7	3	1	--	2 (4)	4 (3)	15 (1)	1	34 (4)
Lost Lake Creek	3.0	0	0	0	0	--	1	--	--	0	--	1	--	10
Little North Fork Clearwater River														
1268 Bridge to Lund Cr.	7.0	--	--	--	--	--	--	--	17	6	13	8	16	18
Lund Cr. to Lost Lake Cr.	3.8	--	--	3	1	9	8	3	12	5 (2)	7	5	8	16
Lost Lake Cr. to headwaters	5.4	0	2	0	0	--	5	1	--	5	5 (1)	5	11	13
Total for all streams	41.9	0	10	6	4	17	18	18	39	30 (6)	43 (5)	43 (1)	82	111 (4)

[a] Streams were survyed between 9/16/1994 and 9/19/1994 - one week earlier than surveys in following years.
[b] Redds counted by personnel from the Clearwater Region.

B) Westslope Cutthroat Trout

Relative abundance of fish species observed during electrofishing in selected tributaries on the St. Joe Ranger District in 2006 is displayed in the following figure.

Figure 13. Relative abundance of fish species sampled in some tributaries in the St. Joe basin in 2006



Literature Cited

Abbott, A. M. 2000. Land management and flooding effects on the distribution and abundance of cutthroat trout in the Coeur d'Alene river system, Idaho. Master's Thesis, University of Idaho. Moscow ID. 86 pp.

Downs, C. C. and R. Jakubowski. 2007. Lake Pend Oreille/Clark Fork River fishery research and monitoring. Progress report 2006. IDFG 07-45. 160 pp.

Dunnigan, J .L. 1997. The Spatial Distribution of Cutthroat trout in the Coeur d'Alene river system, Idaho. Master's Thesis, University of Idaho. Moscow ID. 65pp

DuPont, J. and N. Horner. 2006. Little North Fork Clearwater fishery assessment. IDFG 06-10. 79 pp.

Van Deventer, J.S and W. S. Platts. 1989**.** Microcomputer Software System for Generating Population Statistics from Electrofishing Data--User's Guide for MicroFish 3.0. USDA Forest Service, General Technical Report INT-254. 29 pp.

Walters, J. P. 2006. Kootenai River fisheries investigations: Salmonid studies. Annual progress report: April 1, 2005-march 31, 2006. IDFG 06-48. 23 pp.

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 found in 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. Water howellia 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. According to USFWS, water howellia is suspected to occur on the IPNF in Kootenai, Shoshone and Benewah Counties (USDI 2007).

In early 1998, the U.S. Fish and Wildlife Service (USFWS) listed the orchid, *Spiranthes diluvialis* (Ute ladies'-tresses), 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, the USFWS saw northern Idaho as a potential habitat for orchids. Northern Idaho was thought by USFWS 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 reports released in 1999 and 2001 on predicting the distribution of potential habitat, the Idaho Conservation Data Center disclosed that very few of the plant associations known to host Ute ladies'-tresses occur in northern Idaho. The likelihood of Ute's ladies-tresses occurring in northern Idaho is remote. In 2004 USFWS, which has the responsibility for this species, removed *S. diluvialis* from the list of threatened species suspected to occur on the IPNF.

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.

In the spring of 2000, IPNF botanists developed a process to predict potential habitat (e.g. grasslands) utilizing the SILC (Satellite Imagery Land-cover Classification) data. Broad-scale and project level 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 IPNF. According to USFWS, this species is suspected to occur on the IPNF in Kootenai, Shoshone and Benewah Counties.

Sensitive Species and Forest Species of Concern: In October of 2004, the Region 1 sensitive species list was updated, following the Region 1 Species-at-Risk Protocol. The new list contains 59 species designated as sensitive by the USFS. The Species-at-Risk Protocol allows forests to also develop a Forest

Species of Concern (FSOC) List to address other rare species for which there may be local concern. While no biological evaluations are prepared for Forest species of concern as for sensitive plants, viability concerns are addressed in environmental documents. The IPNF currently addresses 44 Forest species of concern.

Candidate Plant Species: Candidate species are those species for 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 USFWS 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.
This species is currently listed on the Regional Forester's sensitive plant list and is addressed in biological evaluations. 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 suitability to support sensitive and rare plants. Habitat found to be suitable within project areas and habitat that 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 2005, Forest botany personnel and contractors performed on-the-ground clearance surveys on 8,462 acres of suitable rare plant habitat in support of various projects including timber, fire, watershed, fisheries, KV, trails, grazing, special uses, and land exchange projects. This also includes 500 acres that were surveyed as part of a Regional pilot study using low-altitude aerial photography to identify suitable rare plant habitat.

In 2006, approximately 4,360 acres of suitable rare plant habitat were surveyed.

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 with training in botany and rare plant identification conduct botanical surveys.

Prior to 1988, the Forest Service did not conduct surveys, and rare plant observations reported to the ICDC were incidental. From 1988 until 1993 the exact number of acres surveyed was not well documented, but is estimated to be about 5,000 acres. Good records of the number of acres surveyed by botany personnel have been kept since 1994. From 1994 through 2006, surveys occurred on 116,112 acres of federal lands with the express purpose of documenting and protecting rare plant populations from management activities and mitigating potential adverse effects. That acreage represents almost 17 percent of the estimated 705,000 acres of suitable rare plant habitat on the IPNF have been surveyed to date.

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 2007), 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 rare plant observations documented 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 900 occurrences of 85 plant species, mostly on federal lands.

In 2005, 49 rare plant occurrences were documented on the IPNF, and in 2006, 23 occurrences were documented.

Formal Population Monitoring: ICDC and USFS botanists have installed a number of formal, permanent monitoring plots over the last ten or more years, and baseline information has been collected (see 1998 Forest Plan Monitoring Report). However, only a few of the formal monitoring plots have had repeated measures taken since initial installation to evaluate population trends. In 2005, monitoring plots for several sensitive species in Grass Creek and Cow Creek on the Bonners Ferry Ranger District were sampled (in early summer and again in autumn). Howell's gumweed (*Grindelia howellii*) permanent plots on St. Maries Ranger District were also sampled. In 2006, along with the biannual sampling of the Grass Creek and Cow Creek plots, permanent monitoring plots established for *Blechnum spicant* (deerfern) in 1991 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 from 1995 - 2005 are shown in the following table. The plots were not sampled in 2006.

Table 36. Howells's Gumweed (*Grindelia howellii*) Monitoring Results, 1995-2005

Plot/ Year	Germ/Juvenile	NFADS	FADS	Ave Flowers	Total Plants
Plot 1 1995	221	48	4	9.33	273
1996	30	99	10	11.50	139
1997	23	21	8	11.13	152
1998	21	89	20	10.00	129
1999	2	62	31	8.65	95
2000	2	32	21	6.70	55
2001	21	22	28	8.30	71
2002	41	27	14	5.90	83
2003	14	13	18	9.94	45
2004	14	25	8	2.50	47
2005	15	5	11	10.30	31
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	7.30	581
1999	114	214	21	4.29	349
2000	71	81	4	3.75	156
2001	22	84	6	8.50	112
2002	93	49	4	7.75	135
2003	63	48	19	10.00	130
2004	127	46	10	4.60	183
2005	116	7	13	6.30	136

Plot/ Year	Germ/Juvenile	NFADS	FADS	Ave Flowers	Total Plants
Plot 3 1995	No data	-	-	-	-
1996	91	166	25	5.76	282
1997	282	219	22	7.64	523
1998	Data not usable	-	-	-	-
1999	126	306	52	4.04	484
2000	39	158	22	3.86	219
2001	99	145	41	5.1	254
2002	502	70	17	3.58	589
2003	231	29	25	3.84	289
2004	28	94	7	3.80	129
2005	Plot stakes missing	-	-	-	-

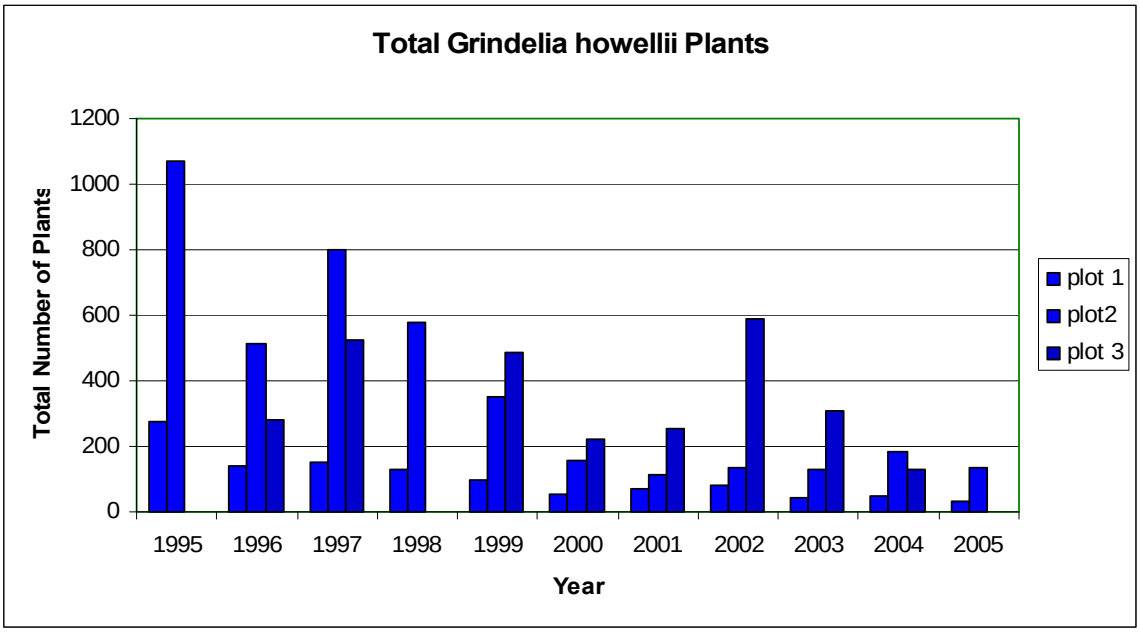
*(Germ = germinant; NFAD = non-flowering adult; FADS = Flowering adult. Average flowers is average flowers per flowering plant)

The population of Howell's gumweed being monitored is 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. The trend from 1999 to 2005 is a steady decline in the total number of plants on plots 1 and 2. Plot 1 went from 95 to 47 and plot 2 went from 349 to 136. Eleven years of monitoring data for plots 1 and 2 show a cyclical trend, likely a response to the same environmental stimuli: precipitation, snow-pack, etc.
Plot 3 was not established until 1996, and a sampling error in 1998 rendered the plot 3 data unusable. Plot 3 shows a fluctuation, up and down, between 484 and 129 total plants through 2004 - no data were collected on plot 3 in 2005.

There are a total of 14 Howell's gumweed 'colonies' within an approximately two square mile area; this represents the extent of known populations in Idaho. These three plots are representative of the 14 colonies, and likely reflect what is happening to the entire population in the area.

Figure 14. Monitoring results for *Grindelia howellii*, 1995-2005



Deerfern (*Blechnum spicant*): In 2006, formal monitoring of a population of deerfern was conducted on the Priest Lake Ranger District. Seven permanent plots had been established in 1991 and had been sampled in 1994, 1997 and 2001. These plots encompass a single, large linear population of deerfern along an intermittent stream. Two separate regeneration harvests of the surrounding late successional forests were accomplished in the late 1980s, before this species was added to the Region 1 sensitive species list. Plots were established the year after the activity was completed.

One plot in an undisturbed portion of old growth western hemlock forest (plot 2) serves as a control plot. Three plots are located at the edge of a harvest unit (plots 1, 3 and 7); they experienced a change in light regime (i.e. increased insulation) but little ground disturbance. Three plots are in the harvest unit (plots 4, 5 and 6); plants in these plots experienced both increased insulation and ground disturbance. While plot 4 receives some shade from residual western hemlock, plots 5 and 6 are in full sun.

Monitoring results: Summary monitoring results by treatment type from 1991-2006 are shown in Table 37 below. More detailed plot and re-measurement monitoring results from 1991 to 2006 are shown in Table 38 below. The undisturbed control plot (plot 2) showed a slight increase in number of plants from 2001 and an overall increase of two plants from 1991 (9% increase since 1991). Most plots either in or on the edge of disturbance from the timber harvest showed an overall increase in numbers from 1991. Since the previous measurement in 2001, four plots showed a decrease in numbers from 2001, while two plots showed an increase from 2001.

From 1991 to 2006 the untreated control plot showed a 9% increase in total deerfern plants. In the same period the three edge plots without any ground disturbance, (plots 1, 3, & 7) had a 5% increase in overall deerfern numbers, although there was considerable variation in population change between these plots. From 1991 to 2006 total deerfern numbers in all the disturbed plots increased 71%. In the disturbed plots that also had full sunlight, overall deerfern numbers increased 91%. In the disturbed plot with partial shade, deerfern numbers increased 34%.

Table 37. Summary of *Blechnum spicant* monitoring by treatment type: 1991-2006

Treatment	Plot #	1991 # Deerfern Individuals	2006 # Deerfern Individuals	% Change in # of Deerfern Individuals: 1991 - 2006
Control	**2**	**23**	**25**	**+9%**
Undisturbed Edge	1	118	124	+5%
Undisturbed Edge	3	69	58	*(-16%)*
Undisturbed Edge	7	52	68	+31%
Totals – Undisturbed Edge		**239**	**250**	**+5%**
Disturbed – Partial Shade	4	35	47	+34%
Disturbed – Full Sun	5	6	16	+167%
Disturbed – Full Sun	6	58	106	+83%
Total – Disturbed Plots		**99**	**169**	**+71%**
Total – Disturbed Full Sun		**64**	**122**	**+91%**

The monitoring of this deerfern population was initially designed as a ten-year project. However, it has been determined that long-term monitoring of the populations may provide valuable information on the response of this species to the recovery of the disturbed areas. The next scheduled sampling of the plots is in 2011.

Table 38. Blechnum spicant monitoring plots, 1991-2006

Plot	Year	Juvenile	Juvenile flwr	Vegetative adults	Flwrg adults	Flwrg plus	Total	Yr to Yr Change #'s	Total % Change 91 – 06
1 - E	**1991**	17	0	101	0	0	118	n/a	
	1994	44	0	120	11	0	175	+57	
	1997	93	0	165	3	0	261	+86	
	2001	57	1	67	0	0	125	-136	
	2006	34	0	76	12	2	124	-1	
Total	**Change**	**+17**	**0**	**-25**	**+12**	**+2**	**+6**		**+5%**
2 - U	**1991**	5	0	15	2	1	23	n/a	
	1994	4	0	14	4	0	22	-1	
	1997	4	0	23	0	0	27	+5	
	2001	1	0	20	0	0	21	-6	
	2006	0	0	22	2	1	25	+4	
Total	**Change**	**-5**	**0**	**+7**	**0**	**0**	**+2**		**+9%**

Plot	Year	Juvenile	Juvenile flwr	Vegetative adults	Flwrg adults	Flwrg plus	Total	Yr to Yr Change #'s	Total % Change 91 – 06
3 - E	**1991**	6	0	43	20	0	69	n/a	
	1994	8	6	22	24	0	60	-9	
	1997	28	7	66	1	0	102	+42	
	2001	15	6	55	6	0	82	-20	
	2006	4	1	37	12	4	58	-24	
Total	**Change**	**-2**	**+1**	**-6**	**-8**	**+4**	**-11**		***-16%***
4 - D	**1991**	2	0	11	11	11	35	n/a	
	1994	12	0	13	16	1	42	+7	
	1997	9	0	46	1	0	56	+14	
	2001	8	1	31	14	0	54	-2	
	2006	1	0	41	3	2	47	-7	
Total	**Change**	**-1**	**+0**	**+30**	**-8**	**-9**	**+12**		**+34%**
5 - D	**1991**	0	0	3	1	2	6	n/a	
	1994	15	0	0	1	3	19	+13	
	1997	5	0	6	5	2	18	-1	
	2001	0	0	2	1	3	6	-12	
	2006	0	0	13	3	0	16	+10	
Total	**Change**	**0**	**0**	**+10**	**+2**	**-2**	**+10**		**+167%**
6 - D	**1991**	10	8	2	13	25	58	n/a	
	1994	13	1	36	24	4	78	+20	
	1997	64	2	49	12	3	130	+52	
	2001	43	12	20	17	0	92	-38	
	2006	40	9	40	17	0	106	+6	
Total	**Change**	**+30**	**+1**	**+38**	**+4**	**-25**	**+48**		**+83%**
7 - E	**1991**	6	0	2	7	37	52	n/a	

Plot	Year	Juvenile	Juvenile flwr	Vegetative adults	Flwrg adults	Flwrg plus	Total	Yr to Yr Change #'s	Total % Change 91 – 06
	1994	20	0	31	14	8	73	+21	
	1997	37	0	53	15	3	108	+35	
	2001	25	0	48	34	2	112	+4	
	2006	8	0	37	18	5	68	-44	
Total	**Change**	**+2**	**0**	**+35**	**+11**	**-32**	**+16**		**+31%**

U = Undisturbed plot E = Edge plot D = Disturbed plot

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

Monitoring at Grass Creek and Cow Creek was initiated in 2004 to determine the effects of grazing within cattle allotments on fen habitats that support rare plant species. Three plots were established in Cow Creek and three in Grass Creek, with a control plot in the nearby Smith Creek Research Natural Area.

The plots consist of permanent photo points and site monitoring that indicates overall site quality, rare plant population vigor and any damage to the habitat. The plots are visited each year both before grazing begins and as the grazing season ends in October.

Monitoring in 2004 had revealed extensive use of one plot and the surrounding fen habitat by cattle. In 2005, before the grazing season began, a fence was erected to exclude cattle from the fen.

2005 Pre-Grazing Results: Plots in Cow Creek had vigorous populations of the sensitive species *Trientalis arctica* and *Carex magellanica* ssp. *irrigua*. The sensitive species *Trichophorum alpinum* occurred in one plot. *Carex leptalea* was also represented.

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

During the 2005 pre-grazing visit, it was observed that vegetation in the one fen in Grass Creek that had been heavily browsed by cattle in 2004 had recovered. In addition, it appeared that the *Sphagnum* mat had mostly recovered where it had been trampled by cattle. See the following photos.

2005 Post-Grazing Results: In Cow Creek, only incidental use by cattle was noted in fen habitats; most such use was associated with access by cattle to the creek. No damage by cattle to fens in any plots was noted. No damage to the control plot was noted.

In Grass Creek, two of the three monitor plots had no signs of cattle usage (the fen that had been trampled by cattle in 2004 had been fenced early in the grazing season and showed no signs of cattle use during the 2005 grazing season). The third plot also had no signs of cattle usage, although the area in which the plot occurs had tracks on the margins and into the edge of the meadow.

2006 pre-grazing results were essentially the same as for 2005.

2006 post-grazing results for all plots noted that the fens were much drier at the end of the grazing season than in previous years. An increase in use by cattle was noted; however, the use consisted mostly of passing through, with little or no damage noted to the fens. If the fens become unusually dry in successive years, the potential for damage from cattle may increase.

Figure 15. Trampling by cattle in Grass Creek Plot 1, post-grazing, October, 2004

Figure 16. Recovery of area trampled by cattle in Plot 1, Grass Creek, June, 2005

Conservation Strategies and Assessments: A conservation assessment for sensitive moonworts (*Botrychium* Sw. species) prepared in 2004 was finalized in 2005. The report detailed current information on the status, distribution, biology and threats for eleven rare moonworts. The conservation assessment will provide a foundation for the development of a conservation strategy for rare moonworts, which will include guidelines for monitoring and management of the species. The purpose of conservation strategies is to ensure species viability is maintained and to prevent the need for federal listing.

Literature Cited

ICDC. 2007. Idaho Department of Fish and Game Conservation Data Center. Element occurrence records. Contained in an electronic database. Boise, Idaho.

USDI Fish and Wildlife Service. 2001. A 12 Month Finding for a Petition to Add *Botrychium lineare* (Slender Moonwort) to the List of Threatened and Endangered Species. Federal Register. June 6, 2001. Volume 66, Number 109.

USDI Fish and Wildlife Service. 2007. Updated list of Threatened, Endangered, Proposed and Candidate species for northern Idaho and eastern Washington. May 31, 2007. Available online at *http://www.fws.gov/easternwashington*.

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

The 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.

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

For 2005 and 2006 there were 6 and 13 open "active" mining plans on the forest. All were inspected regularly for compliance when active. Any noncompliance was corrected with a notice of noncompliance and documented appropriately. As for inactive mine sites addressed – this includes clean-ups (CERCLA) and safety mitigation (Bat gates, plugs, etc) – 16 sites were addressed in 2005 and 21 sites were addressed in 2006.

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 – 2,416 (2005) and 1,332 (2006) (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 – 6 (2005) and 13 (2006)

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 – 6 (2005) and 13 (2006)

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 – 6 (2005) and 13 (2006)

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

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

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

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

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

Definitions of what is considered detrimental impacts:

- Detrimental Compaction: More than 20% increase in bulk density over natural for volcanic ash surface soils and the compacted soil must display a massive or platy structure.
- Detrimental Displacement: Removal of the forest floor and one inch or more of the surface mineral soil over a 25 ft^2 or more area.
- Severely Burned: The soil surface is in a condition where most woody debris and the entire forest floor are consumed down to mineral soil. The soil's 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).

Soils monitoring for 2005 and 2006 focused on the following:

1. Monitoring of pre-harvest soil conditions.
2. Monitoring of post-harvest soil conditions.
3. Monitoring of the Lookout Ski Area on the Coeur d'Alene Ranger District.
4. Post-harvest BMP (Best Management Practices) effectiveness monitoring.
5. Effectiveness monitoring of subsoiling/decompaction efforts
6. Comparison of qualitative and quantitative methods to determine soil disturbance.
7. Monitoring of the Cow Creek Allotment on the Bonners Ferry RD
8. Monitoring of the North Fork St. Joe prescribed burn, St. Joe RD.

1. Monitoring of pre-harvest soil conditions

In 2005, 136 units on 11 proposed timber sales were evaluated to determine existing pre-harvest conditions and what additional mitigation recommendations needed to be made to ensure that Forest Plan and Regional Soil Quality Standards are met. Results showed that over three quarters of the units had little to low existing impacts while legacy management activities impacts in the remaining quarter were higher or, such as in five cases, exceeded soil quality standards. Based on these results, design criteria recommendations were provided to reduce any additional impacts that may occur from proposed activities.

Table 39. 2005 monitoring of pre-harvest soil conditions

	Existing Condition - Range of Disturbance			
Proposed Timber Sale	**0% to 5%**	**6% to 10%**	**11% to 15%**	**>15%**
Hidden Cedar	24			
Prichard Murray	26			
Deerfoot	36	1		
High Bridge	1			
Tumbledown	9	4	3	
South Grouse	3	1	1	
Careywood	1		1	
Ruby-Copper		1		
Eastport	1	3	1	
Templeman		2		4
Myrtle Creek	6	1	5	1
Total	**107**	**13**	**11**	**5**

In 2006, eighty-one units on ten proposed timber sales were evaluated to determine existing pre-harvest conditions and any additional mitigation recommendations needed to ensure that Forest Plan and Regional Soil Quality Standards are met. Results showed that about three quarters of the units had little to low existing impacts while legacy management activities impacts in the remaining quarter are higher. With the exception of units that are first entry, numerous areas contain legacy impacts from the past activities show that disturbances diminish over time. None of the monitored units exceeded 15 percent soil quality standards. Based on these results, design criteria recommendations were provided to reduce any additional impacts that may occur from proposed activities.

Table 40. 2006 monitoring of pre-harvest soil conditions

	Existing Condition - Range of Disturbance			
Proposed Timber Sale	**0% to 5%**	**6% to 10%**	**11% to 15%**	**>15%**
Moyie Mine			4	
Pork Chop	3	3	1	
Bussel 484	7	2	1	
Avery Fuels Reduction	3			
Fallen Bear	36	6		
Dutch Cat		1		
Rising Cougar			2	
Templeman	1			
South Copper Down	4			
Jo-Cat	6	1		
Total	**60**	**13**	**8**	**0**

Recommendations to reduce impacts from proposed activities include but were not limited to:

- Utilizing existing skid trails and landings where appropriate in order to maintain current soil compaction levels below the 15% requirement. Post-harvest, all utilized skid trails should be covered with slash and randomly placed logs (on contour) to increase the microtopography needed to reduce runoff, stabilized with waterbars, or a combination thereof.
- Avoiding operation of equipment in moist or wet depressional areas.
- Limiting logging to times when conditions are dry.
- Operating equipment on a layer of slash whenever possible to reduce compaction.
- Considering winter logging. Operating logging equipment in the winter with either:
    - A 24 inch snow layer or 18 inches of settled snow;
    - Restricted equipment operation to skid trails or where adequate slash matting exists, or operating when the ground is frozen to a depth of 4 inches.
- Considering post-harvest decompaction of skid trails and landings to improve the activity area and initiate recovery of soil productivity (this is a good option for units that already have elevated existing detrimental condition; however, it is site specific since more damage than good may be done under certain circumstances; i.e. increased mixing of remaining ash layer with less productive subsoils, surface sealing of decompacted soils with greater clay content, damage to remaining root structures, etc.).
- Changing logging system where applicable (i.e. change tractor to less impacting skyline or helicopter treatments).
- Dropping a unit.

<u>Recommendations related to soil productivity:</u>

- Overwinter slash to recycle nutrients back into the soil.
- Ensure that enough coarse woody debris will be left to sustain long term soil productivity following guidelines in Graham et al. (1994).
- Limiting prescribed burning to those times when soil moisture is above 25% or duff moistures are elevated to reduce the potential for hot burns, to retain duff and organic material, and to reduce or eliminate potential erosion, especially in steeper terrain.

Monitored levels of organic matter were variable in all units but generally ranged between low to optimal with some higher values, especially in moist site habitats. Monitoring data from 2005 indicated existing amounts of coarse woody debris were generally too low (<7 tons/acre) for several out of the 107 proposed timber sale units. The low levels were primarily located on the Central Zone and may be a remaining effect of past management practices and/or the 1910 stand replacing fires that consumed a large portion of the timber on the Coeur d'Alene Ranger District. In 2006, existing amounts of coarse woody debris were also found to be generally too low (<5 tons/acre) for several of the proposed timber sale units. These evaluations allowed for recommendations to be made to leave additional coarse woody debris after the harvest.

2. Monitoring of post-harvest timber sale conditions

Seven units on four timber sales were monitored for post harvest levels of management impacts in 2005. The majority of tractor units showed 10 to 12 percent detrimental soil impacts for summer logging which were around the expected (~13%) disturbance associated with such equipment. A winter-logged unit rated at 5 percent. One unit was slightly above the standard which was due to close spacing of skid trails. All

skyline/cable units were below the expected (~2%) impact levels and met Forest Plan and Regional Standards. Coarse woody debris retention was satisfactory in all but one unit.

Table 41. 2005 monitoring results of post-harvest detrimental soil impacts

Timber Sale	Unit	Accomplished Year	Equipment	Fuels Rx	Detrimental Soil Impacts %	CWD Tons/acre
Lakeface Lamb	49	2002	Tractor	UB	10	15
Lakeface Lamb	63	2005	Harvester Forwarder	GP	5	
Little Blacktail	33	2005	Skyline		0	13
Little Blacktail	34	2005	Hand felled - skidded	GP	12	4
Little Blacktail	47	2005	CTL	GP	16	10
Lower Marble	32	2005	Skyline		0	22
Dutch Cat	2	2005	Skyline		0	17

HF = Harvester/Forwarder
CTL= Cut-to-length
GP = Grapple Pile
UB = Underburn
CWD = Coarse Woody Debris

Twenty units on 6 timber sales were monitored for post harvest levels of management impacts in 2006. The majority of tractor units showed 10 to 13 percent of detrimental soil impacts for summer logging which were around the expected (~13%) disturbance associated with such equipment, therefore meeting Forest Plan and Regional Standards. Retention of coarse woody debris was satisfactory in all but one unit.

Two winter-logged units rated at 8 and 10 percent. Impacts were not caused by the winter operations but were almost exclusively due to rutting from grapple piling, especially in Unit 4 where the equipment ascended onto 45 to 50 percent slopes. The very dry conditions in the summer helped to reduce compaction but rutting on the steep slopes and turning of equipment instead of backing out created more disturbance than anticipated. The ongoing grapple piling at that time was terminated due to the excessive slope gradient.

The Moyie Place timber sale occurred in an area that was previously disturbed from past management activities, recreational use, and a turn-of-the-century mining town. Increased levels of compaction were primarily due to skid trails that were too closely spaced and underlying legacy disturbance. Unit 8a was decompacted after monitoring took place and will be re-evaluated in the future.

The Charlie Horse sale showed some elevated impacts from legacy ground-based yarding though overall results for the horse logging operation showed generally light impacts throughout the units. Compaction on narrow skid trails was shallow (primarily limited to the upper 1 to 2 inches of soils) and are expected to recover quickly as the surrounding vegetation takes over.

All but one monitored unit on the Brew-Ski timber sale showed increased disturbance. Close skid trail spacing and turning of equipment on steeper slopes was the issue on the majority of the units, which are part of the new ski runs for the Lookout Mountain Ski Area. This area was shown to display the greatest long-term disturbance when the productive ash cap layers are displaced and the underlying coarser materials are exposed. Based on observations on older ski runs in the vicinity, these areas can experience increased erosion potential, especially if drainage features (such as waterbars) are inadequate. The units that were skylined were in excellent shape and showed little to no disturbance from logging. Surface soils were intact and vegetation (mainly beargrass, grasses, and forbs) remained and will continue to protect the steep slopes. Due to the recreational status of this area, R1 Soil Quality Standards do not apply.

Table 42. 2006 monitoring results of post-harvest detrimental soil impacts

Timber Sale	Unit	Accomplished Year	Equipment	Fuels Rx	Detrimental Soil Impacts %	CWD Tons/ acre
Kedish Ridge (NZ)	4	Winter '05/'06	HF	GP	8**	36*
	8	Winter '05/'06	HF	GP	10**	21
Charlie Horse (SZ)	1	2005	Horse	not yet	6	16
	2	2005	Horse	not yet	9	59
	3	2005	Horse (legacy GB)	not yet	10	35
Moyie Place (NZ)	2	2006	FB/P/S	GP	11	10
	4	2006	FB/P/S	GP	15	15
	8a	2006	FB/P/S	not yet	19#	29
	8b	2006	FB/P/S	not yet	22	23
Cocolalla West (NZ)	2	2006	FB/P/F	GP	13	5
	3	2006	FB/P/F	GP	14	13
Brew-Ski (CZ)	1	2005/06	FB/S	HP	25	n/a
(Lookout Mtn. Ski	2	2005/06	FB/S	HP	23 (25)	n/a
Area – rec site so	4	2005/06	Sky		2 (4)	n/a
SQS do not apply)	6	2005/06	FB/S	HP	27	n/a
	9	2005/06	FB/S		19	4
Rye on Ham (SZ)	1	2005	FB/S	none	13	19
	3	2005	FB/S	UB	11 (13)^	13
	8a	2005	FB/S	UB	12 (15)^	16
	8b	2005	Sky	UB	0 (5)	37

H = Harvester
F = Forwarder
FB = Feller-Buncher
P = Processor
S = Skidder
Sky = Skyline
HP = Hand piled
GP = Grapple Pile

UB = Underburn
CWD = Coarse Woody Debris
GB = Ground-based
*Unit was only partially grapple piled, t/ac will be reduced further.
was decompacted at a later point
^Numbers in parenthesis include disturbance from recent UB

**Majority of impacts from grapple piling; little to no impacts from winter logging observed in adjacent units not grapple piled yet. No formal monitoring was undertaken elsewhere due to thick slash mat, which made it difficult to do effective transects

In general, grapple piling activities and close spacing of skid trails were observed to be the main cause for increased disturbance levels in several harvest areas. Site prep activities should re-use existing skid trails whenever possible and avoid turning of equipment, especially on steeper slopes. Backing in and out is a practice that reduces displacement and the creation of berms. Skid trails should be designated and spacing should be maximized whenever possible.

3. Monitoring of the Lookout Mountain Ski Area on the Coeur d'Alene Ranger District

Several new ski runs were added to the Lookout Pass ski area in 2003, which involved removal of trees along several corridors on the southeast side of Runt Mountain above FR4208. In 2004, a random transect along Run 2 showed increased rilling and gullying mid slope below a decommissioned old jeep road (2004 IPNF Monitoring Report). The re-contouring was observed to be ineffective, skid trails moved straight up the slope, and no drainage was provided along the entire face of the ski run. Recommendations were made to the CDA District representative and passed on to the ski area managers.

In 2005, re-evaluation of the same area as well as additional runs on the ski area showed no improvement. Installation and continuous maintenance of drainage features, such as waterbars, appear to be the biggest problem on the mountain. Especially after new construction, it is crucial to reduce runoff and erosion until the area has revegetated. The key to stable ski runs is retention of topsoil and organic material. Extensive erosion and displacement was almost exclusively observed where topsoil was removed and the underlying sensitive rocky soils and substratum have been exposed.

Drainage problems usually start high on the hill with small features such as rills and small gullies but steadily increase and amplify as flow gets concentrated downhill. Drainage features should therefore be considered at a bigger scale for an entire hill and not just be installed to patch areas that show current degradation, such as near the lodge. The initial investment in maintenance and installation will pay off long-term and allow the mountain to retain soil on the slope.

Problem areas that were identified in 2005 were again identified in 2006. Mitigation recommendations were made, and a copy of "Ski Area BMPs" was given to mountain operations staff. Priorities should focus on fixing what is starting to deteriorate before impacts worsen both environmentally as well as monetarily. The area will continue to be monitored in the future.

4. Best Management Practices (BMP) Effectiveness Monitoring

Overall BMP effectiveness, related to the Idaho Forest Practices Act (FPA), was qualitatively rated by monitoring teams. For 2005, two units showed an overall effectiveness rated as moderately high and five units were evaluated as highly effective (Table 43). In 2006, two units showed an overall effectiveness rated as moderately high, the other three were rated as highly effective (Table 44).

Table 43. Results of BMP monitoring on the St. Joe Ranger District in 2005

Timber Sale	Unit	Overall Effectiveness (%)
Dutch Cat	1B	Moderate High
	2	High
Lower Marble	1	High
	30	Moderate High
	32	High
Bussell 484	100	High
Rye on Ham	95	High

*moderate high (50 – 85%)
high (>85%)

Table 44. Results of BMP monitoring on the St. Joe Ranger District in 2006

Timber Sale	Unit	Overall Effectiveness (%)
Dutch Cat	13	Moderate High
	17	High
DS Anthony	2	Moderate High
Broadaxe	2	High
	4	High

*moderate high (50 – 85%)
high (>85%)

5. Effectiveness Monitoring

A. Subsoiling on the Nordman Timber Sale, Priest Lake RD

The tractor-logged Nordman timber sale units were ripped and subsoiled in 2003 with a rear-mounted subsoiler with two wings that ripped at ~20 to 24 inch depths. All units were subsoiled with the exception of Unit 5 in which skid trails were decompacted. According to District personnel, Units 3 and 5

resembled a "parking lot" before subsoiling and soils were too compacted for replanting. By decompacting the units, western larch and white pine were planted and the area is now re-vegetating with forbs, grasses and will continue to recover naturally over time.

Bulk density (BD) samples were taken on a transect in Unit 3 at intervals of 30 feet to determine how current bulk densities compare with readings from an undisturbed control site (BD average for undisturbed samples = 0.62 g/cm^3) adjacent to the logged area (Table 45). Unfortunately, no pre-decompaction BD data or even photos are available. All samples were taken on the surface layer unless otherwise stated. Though some patches still appear more compacted than others, the overall improvement is undeniable. The operator was able to keep mixing to a minimum though some spots contain greater amounts of gravels and cobbles mixed with some of the underlying outwash material. An increased number of stumps also complicated decompaction efforts and forced the equipment to work around the obstacles, which may explain why some locations did not show greater improvement. Skid trails are not easily apparent anymore and the increased microtopography offers a good growing habitat for ground cover and trees.

Table 45. Bulk density results for a transect traversing through Unit 3

Location	Bulk Density g/cm^3
North	
Near unit boundary	0.67
Mound	0.66
Mound	0.62
Under debris	0.66
Near stump, undisturbed	0.69
Under debris, compacted	1.02
Mound, pure ash pushed up	0.52
Furrow	0.76
Between stumps	0.81
Near furrow	0.87
Ripped	0.78
Near unit boundary	0.72
South	
Average	**0.73**
Standard deviation	**0.13**

Based on the small sample number, the results are not statistically valid but provide a rough estimate of what can be accomplished when decompaction efforts are undertaken

Bulk densities were taken on skid trails in Unit 5 since these were the only areas that were decompacted within the unit (Table 46). Portions of the skid trails are still visible while others have blended in so well that it is difficult to decipher their presence.

Table 46. Bulk density results for skid trails in Unit 5

Location	Bulk Density g/cm^3	
Rut	0.80	
Center	0.92	
Rut	0.79	
Rut	0.97	3-5 in.

All skid trail samples exceeded soil quality standards when compared to average control values with the greatest compaction levels measured at a depth of ~3-5 inches. Due to time constraints, no additional

samples were taken for comparison. Visual observation suggested that the improvement from decompaction is definitely greater than what the few samples portrayed. Therefore, it would be useful to take additional measures to verify that assumption. Introduction of heavier subsoils also results in a naturally increased bulk density reading compared to ash-influenced soils with lesser bulk density readings.

In summary, subsoiler decompaction efforts in Unit 3 were successful in improving approximately 50% of the area. Some mixing of ash and the underlying outwash material were observed in localized areas but may have occurred prior to decompaction efforts during harvest. Numerous stumps also made it difficult for the operator to maneuver around the obstacles. Even so, the overall improvement is evident. Considering that the whole unit was heavily compacted and would have remained so for decades to come, the restoration efforts have allowed for the re-planting of larch and white pine, and has promoted grass and forb growth to establish and contribute to the recovery of the area.

Skid trail decompaction in Unit 5 did not show much improvement in the samples taken; however, the overall visual observations of vegetation regeneration and the general reduction or removal of defined visible ground disturbance was very clear. More sampling would need to be taken for both units to be statistically valid and to track the succession over time.

B. Decompaction on the Moyie Woods Timber Sale, Bonners Ferry RD

The Moyie Wood Hazardous Fuels CE was initiated to address accumulating fuel loads within the wildland-urban interface (WUI). The project was designed to reduce excessive forest fuels, including dead, dying, and down timber and live ladder fuels and was completed in August of 2005.

Unit #1 was evaluated in the fall of 2004 using Niehoff's (2004) assessment method and was estimated to be 23 percent impacted. Some skid trails were borderline Class 2 to Class 3 but many showed ample root penetration, vegetative growth (forbs, graminoids, and trees), and fairly intact soil structure. Platyness, the main indicator of compaction, was present at different severity levels and varied primarily within the upper 0 to 4 inches of the surface.

Much of the Moyie Wood project area had been subject to ground disturbing activities within the last two decades and displayed excessive amounts of skid trails spaced anywhere from 20 feet to 75 feet apart as well as one main access road and a landing. To determine whether or not soil scarification *would* initiate and promote soil recovery over time, long-term bulk density plots were established within the project area to monitor effectiveness. The unit was then summer logged and skid trails were decompacted to a depth no less than 3 inches and no more than 7 inches to reduce the chance of mixing of the ash cap with the underlying less productive outwash material. Also, a structure was installed at the entrance to the project area to discourage and inhibit public access.

Decompaction with the excavator bucket loosened the compacted soils and broke up trails that were used by harvest equipment for skidding or served as access routes to the public. Consequently, the trails have experienced different levels of compaction. Those that have re-vegetated over the years often maintained some existing vegetation (especially in the center), which was incorporated by the operator. This should encourage a more rapid recovery and re-vegetation of the otherwise bare ground.

Table 47. Compilation of bulk density results for permanent transect in Unit 1 of the Moyie Woods timber sale

Transect 2 - Well used side road (adjacent to main road and Transect 1)		
Location	**Initial Bulk Density**	**Bulk Density Nov. '05**
Side (N)	0.54	0.55
Rut	1.03	0.70
Center	0.94	0.89
Rut	0.99	0.47
Side (S)	0.69	0.65
Average	**0.84**	**0.65**
Transect 3 – One pass trail		
Location	**Initial Bulk Density**	**Bulk Density Nov. '05**
Side (N)	0.63	0.54
Rut	0.49	0.76
Center	0.61	0.69
Rut	0.58	0.63
Side (S)	0.58	0.61
Average	**0.58**	**0.65**
Transect 4 – Main skid trail		
Location	**Initial Bulk Density**	**Bulk Density Nov. '05**
Side (W)	0.64	0.55
Rut	0.76	0.76
Center	0.96	0.84
Rut	0.66	0.80
Side (E)	0.34	0.56
Average	**0.67**	**0.70**

Bulk density measurements show mixed results. It was also unfortunate that half of the permanent transects were unusable because the trails/roads were not decompacted, reducing the amount of samples that can be evaluated. Though decompaction did not appear to be beneficial everywhere, it has left many areas in an improved state by reducing the compacted surface depth. Continued visual, quantitative, and qualitative monitoring will hopefully give more insight over time as the unit recovers.

The unit was also re-monitored post-harvest to determine the overall outcome of the logging and decompaction operations across the entire activity area. Results showed that 23 percent of the unit is still impacted. Though these results are disappointing and net improvement was not accomplished, the unit meets Region 1 Soil Quality Standards since the "cumulative detrimental effects from project implementation and restoration [does] not exceed the conditions prior to the planned activity…" Future decompaction efforts should take into account operator skills and more rigorous oversight to ensure that all possible trails ready for decompaction are actually worked on.

6. Comparison of Qualitative and Quantitative Methods to Determine Soil Disturbance

In May of 2005, Unit 1 of the proposed Careywood timber sale (Sandpoint RD) was visited to assess existing conditions using random transects. A great amount of the area that appeared to have been impacted by past harvest operation, especially on obvious but only moderately used skid trails, were categorized as only slightly disturbed (Class 2). High moisture content from an unusual rainy season just

prior to sampling was expected to have masked some of the impacts. Fixed sample areas were therefore established and observed by using the shovel test (Niehoff 2002) and qualitatively classifying various levels of soil disturbance as well as comparing it to actual quantitative bulk density readings.

Bulk density samples were taken in areas that represent the general expected disturbance levels throughout the unit: heavy impact (i.e. landings), main skid roads, minimally disturbed areas in between skid trails and landings, well defined less used skid and side trails that have been revegetated, and undisturbed areas that were used as a control (Table 48). Samples were collected using a soil core of fixed volume and were dried at 105ºC for 24 hours.

Each sample point was also observed using the Onsite Assessment Method (Niehoff 2002) which ranks the disturbance level using three classes based on observable soil characteristics. Soil disturbance classes are intended to represent natural conditions (Class 1); slight soil disturbance, which is not affecting the health and functioning of the stand or site (Class 2); and detrimental disturbance which may affect the functioning of the stand or site (Class 3).

Table 48. Percent of sample area considered detrimentally impacted

Sample Area	Percent of sample area with 20% increase over natural bulk density (%)
Landing	83
Main Skid Trail	67
Minimal Disturbance	0
Obvious Skid Trail	14
Side Skid Trail	33
Control	0

Comparison of the visual qualitative assessment to the bulk density (BD) samples shows that most of the observations were compatible to the actual quantitative BD levels. When classification is difficult and falls in between Classes 1/2 or 2/3, the lower ranking score generally appears to be a safe bet.

Volcanic ash soils are detrimentally impacted when samples are 20 percent above natural bulk density readings (R1 Supplement 2509.18-2003-1). Based on the average control reading for this area, this affects samples that are at or above 0.75 g/cm^3. Based on these numbers, greatest impacts were seen on landings and main skid trails where 67 to 83 percent of the samples were considered to be detrimentally disturbed. Compaction on less used skid trails varied between 14 to 33 percent and reflect their main impacts where wheels or tracks made several passes whereas the area in between remains less affected. Portions of the unit between the more obvious and main skid trails may show signs of previous disturbance but impacts remain minimal and bulk densities did not exceed much above the control values.

7. Monitoring of the North Fork St. Joe Prescribed Burn, St. Joe RD

Several units in the mid-portion of the North Fork St. Joe River drainage were burned using aerial ignition in May of 2006 to reduce fuels, primarily shrubs. Soil moisture was measured in a unit above the Hoyt Flats compound (near Avery) and was found to be ~17 percent. However, the instrument was not calibrated correctly and readings could not be used since measurements should be directly taken in the unit(s) or in the vicinity to be burned, not ten air miles away at a different elevation.

Burning of units F8 and F10 took place on May 4, 2006. Unit F7 was burned under drier conditions on May 15th when temperatures rose to ~90ºF with very low humidity for several days. Prescribed fire in the three units, which were thought to be the most heavily and intensely burned, showed little to no soil impacts. Vegetation was quickly re-establishing one month after the burn and was favored by the

remaining granular soil structure, retention and flush of nutrients, and intact duff layer that closely resembled pre-burn conditions at around 1 to 2 inches.

Besides one small area in unit F7, no rilling, gullying, or sediment, duff, and ash transport were found even after heavy rains that the area experienced over the days previous to monitoring. The road system below the unit also showed no evidence of blowouts, increased sediment movement, ash, or debris deposits in the ditches etc. None were found within the units either (i.e. sediment accumulation behind logs on contour that would have captured runoff).

The overall success of this prescribed burn can likely be attributed to a sufficient amount of soil and duff moisture. This kept organic matter intact, shielding the below lying mineral soil and providing a favorable environment for vegetation to quickly establish to further protect and stabilize the steep slopes. It also shows that despite high burn intensities, soil burn severity can be relatively low. Once again, the aim for any prescribed burn should include maintaining intact layers of organic material that protect soils and promote re-vegetation.

IV. OTHER TOPICS OF INTEREST

The Forest Plan does not require that the information in this section be part of the monitoring report. The information is included because of public interest in these subjects of forest-wide importance. Topics addressed include ecosystem restoration and old growth.

Ecosystem Restoration

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

Our forestland problems include the large-scale loss of potentially long-lived, shade-intolerant, tree species, such as white pine, whitebark pine, western larch and ponderosa pine. These species have been replaced with species such as grand fir and hemlock, which are less drought tolerant and more prone to attacks from insects and disease and less fire resistant. Besides reductions in the shade-intolerant tree species, the number of shade-tolerant, moisture-demanding small understory trees per acre may have also increased. There is also 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, 1992-2006

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 2,871 and 2,919 acres were planted to these species in 2005 and 2006. (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 1992-2006 there were 73,845 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 2005 and 2006, the IPNF planted approximately 664,538 rust resistant white pine seedlings.
- From 1992 through 2006 the forest planted over 12,308,708 rust resistant white pine seedlings.

The second part of the IPNFs' 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. The IPNF has 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, the forest has 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 2005 and 2006, the Idaho Panhandle National Forests pruned approximately 5,416 acres where pine is a major portion of the forest.
- From fiscal year 1992 through 2006, the Forest has pruned about 34,220 acres.

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

3) Managing tree stocking and forest structure

- 5,633 acres were thinned or released in fiscal years 2005 and 2006. 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 1992-2006, 82,561 acres were thinned or released.

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

- There were 22,517 acres of harvest related natural fuel reduction accomplished fiscal years 2005 and 2006.
- There were 15,193 acres of natural fuel reduction accomplished in fiscal years 2005 and 2006.

5) Watershed Improvement

- 397 acres of watershed improvement were accomplished in fiscal years 2005 and 2006.
- From fiscal year 1992 to 2006 there were 10,483 acres of watershed improvement accomplished.

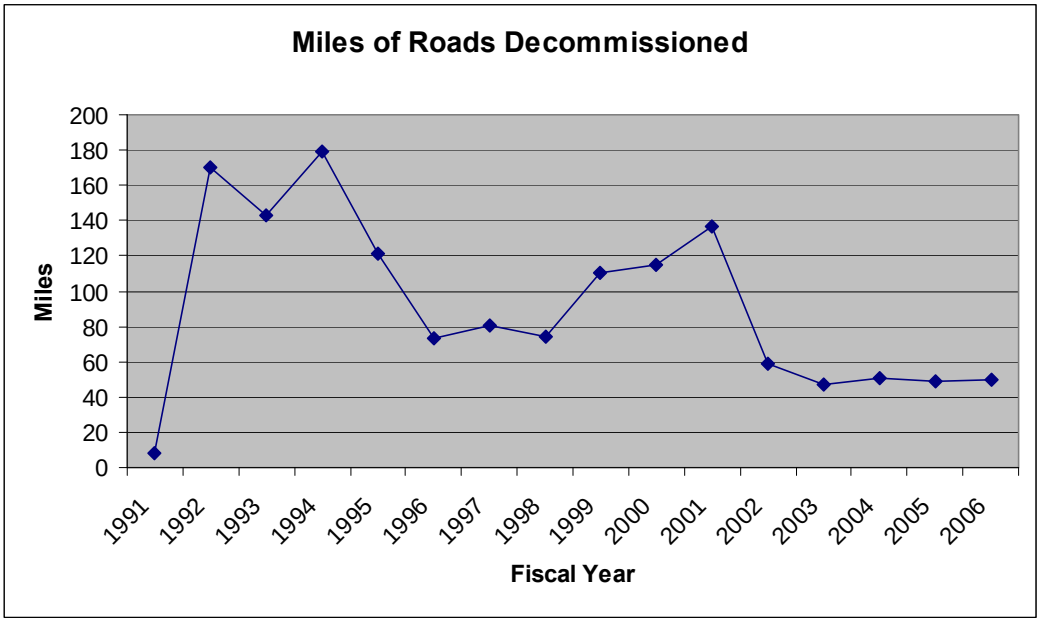
6) Road decommissioning

- There were 98.9 miles of road decommissioned in fiscal years 2005 and 2006 as part of ecosystem restoration work, using a variety of funds.
- The following table shows that there were 1,466.5 miles of road decommissioning on the Idaho Panhandle National Forests from fiscal year 1991 to 2006. 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
2004	48.9	1.6	50.5
2005	30.8	17.9	48.7
2006	24.1	26.1	50.2
TOTAL	**1,099.1**	**367.4**	**1,466.5**

Figure 17. Miles of Roads Decommissioned



Restoration Activities

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

Old Growth

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

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

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

1) Old Growth Estimates from FIA Data

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

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

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

Because FIA data comes from a statistical sample rather than a 100% census, we describe attributes calculated from this data as estimates and the accuracy of these estimates is computed and reported as confidence limits. The Forest Service Northern Region and the IPNF use a 90%-confidence interval for describing the reliability of FIA estimates. The 90% level was chosen to provide a fairly precise level for a biological attribute that can be very variable. This confidence interval can be understood as indicating that if a different set of randomized sample points were collected 100 different times, the estimates of the

percent old growth would be within the 90%-confidence interval 90% of the time. This also indicates that if every tree on every acre were measured, there is a 90% probability that the true proportion of old growth for the population would be within this confidence interval. There is a 5% probability that the proportion of old growth would be less then the lower confidence limit. There is an equal 5% probability that the proportion of old growth would be greater than the upper confidence limit.

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

FIA plot data is tested against the old growth minimum criteria in Table 1 of *Green and others (2005)*. The old growth minimum criteria are the number of trees per acre that exceed old growth minimum ages and diameters, and a minimum forest density measured as basal area per acre. The criteria are specific by Habitat Type and Forest Type combinations. Plots that meet old growth minimum criteria are classified as old growth. Data analysis is automated in the Forest Service, Northern Region, FIA Summary Database. The latest FIA old growth estimates for National Forests in the Northern Region are documented in Region One Vegetation Classification, Mapping, Inventory and Analysis Reports (available from the USFS Northern Region). The forest-wide results presented here are from Report 07-06 v1.2, dated May 16, 2007, titled "Estimates of Old Growth for the Northern Region and National Forests". The more detailed data for distribution of old growth across geographic areas are from Report # 06 – 07, dated April 11, 2006, titled "Estimates of Old Growth Percentages and Snag Density on the Idaho Panhandle National Forest".

Based on FIA data, the estimated percent of old growth on the forested lands of the IPNF is 11.8%. The 90% confidence intervals of this estimate are 9.6% to 14.0%. Given these values, we conclude that the IPNF is meeting Forest Plan Standard 10b. that calls for maintaining "10% of the forested portion of the IPNF as old growth".

These estimates are approximately 1% less than what was reported in the 2004 IPNF Forest Plan Monitoring Report. This does not reflect any change in the situation on the ground, or on the measured FIA plots themselves. Rather, it reflects a 2006 decision by the Forest Service Northern Region to use more conservative techniques for estimating the number of years it takes a tree to grow to breast height (4.5 ft.). These more conservative techniques have the effect of reducing the total ages assigned to trees measured on FIA plots. Because total tree age is one of the criteria for determining old growth, this has the effect of reducing the number of FIA plots that are classified as old growth. The following paragraphs explain this further.

FIA field protocols dictate that age for trees 3.0" DBH and larger is measured by counting annual growth rings at breast height, and recorded as "breast-height age". Breast-height is defined as 4.5' tall. Therefore "breast-height age" is the number of years the tree has survived since it reached 4.5 feet tall, which is less than its total age. In the Northern Region – as typical of temperate forests – coniferous trees always take several years to grow to breast height, and those years need to be added to "breast-height age" to get the total tree age. The minimum age criteria for old growth used in *Green and others* (1992, errata corrected 02/05) is based on total age rather than breast-height age. The data used for making old growth determinations should be consistent with the definitions in *Green and others*, which is the IPNF standard. Therefore, a conservative estimate of the number of years a large tree took to reach breast height is added to the breast height ring count to obtain the total tree age that is used in IPNF old-growth definitions.

A conservative estimate minimizes the risk of over-estimating tree total age, and thus overestimating the percent of the FIA plots that met old growth age criteria. The more conservative the estimate, the fewer the years added to FIA breast height age. In 2005 the Forest Service Northern Region used regression equations developed from 52,000 measured and aged small tree records to estimate years to breast height, and those estimates were utilized in FIA Old Growth amounts shown in the IPNF 2004 monitoring report. In 2006 the Northern Region decided to be even more conservative estimate by screening out the slower growing shade-intolerant trees in the intermediate crown class (reducing the sample population size to 39,000 tree records), and also by using the 20th percentile of the remaining population stratified by species and habitat type group. In its final process, the Northern Region used over 39,000 measured and aged small tree records, and a conservative estimate of years to grow to breast height for trees most likely to survive to old growth ages.

In February, 2006, these very conservative and statistically robust techniques became the Forest Service Northern Region standard approach to estimating the number of years to grow to breast height that were added to breast height ring counts to determine total tree age. The net effect of this change was that fewer measured trees on FIA plots met old growth minimum age criteria (as compared to previous analyses). As a result of this more conservative approach, estimates of old growth percentage for the IPNF, based on FIA plots, are now 11.8% (a decrease of approximately 1%).

More details about breast height age determinations are found in Region One Vegetation Classification, Mapping, Inventory and Analysis Report 08-03, v. 3, June 30, 2008, titled "Estimates of Years to Breast-Height for Large Conifer Tree species in the Northern Region".

FIA old growth percentages by Geographic Area also provide evidence that the old growth is well distributed across the IPNF. Note that as the sample size becomes larger, the confidence intervals are tighter. Estimates for the IPNF as a whole provide the tightest confidence intervals. Estimates of percentage Old Growth by IPNF Geographic Areas and associated 90% confidence intervals are as follows:

Table 50. FIA Current Estimated Percent Old Growth By Geographic Area

IPNF Geographic Areas	90% Confidence Interval Lower Bound	Estimate of Percent Old Growth	90% Confidence Interval Upper Bound
Coeur d'Alene	5.4%	9.2%	12.7%
St. Joe	7.9%	12.0%	16.5%
Sandpoint / Pend Oreille	5.3%	11.1%	17.6%
Bonners Ferry / Kootenai	10.2%	15.9%	21.9%
Priest Lake	6.3%	12.5%	19.3%
Total IPNF	**9.6%**	**11.8%**	**14.0%**

2) <u>IPNF Stand-Level Map of Allocated Old Growth</u>

The IPNF stand-level old growth map represents a census of those stands allocated for old growth retention to meet Forest Plan standards. The stand-level old growth allocation allows us to distribute old growth across the Ranger Districts and landscapes in ways that make ecological sense at the landscape scale, and serves as a basis for project planning. This forest-wide stand map also provides a useful

starting point when we are considering any management activity, and need to take a more detailed look at old growth allocations within a potential project area. The stand map also allows us to display to the public that adequate amounts of old growth are allocated and distributed across the landscape.

The IPNF stand-level old growth allocation represents a different approach to monitoring old growth than the FIA sample, and was designed and implemented independently from the FIA inventory. Forest stand information is gathered by Ranger District personnel or contractors working for the Ranger District. Most old growth stands are examined with a formal systematic grid of stand exam plots that counts and measures all designated sample trees on these plots. Allocation decisions for old growth stands are based on field examination, but usually also include landscape relationships in making the allocation. A smaller proportion of stands were allocated to old growth based on less formal notes and measurements from walk-through, field verification surveys by foresters and forestry technicians knowledgeable about old growth definitions. Less than 1.3% of old growth stands were allocated based on photo inventory, and all of those will be field verified before any forest management projects are carried out in those watersheds.

Ranger district stand-level old growth allocation utilizes the latest stand inventory data to assess how well stands meet the old growth definitions in the IPNF Forest Plan, utilizing criteria in *Green, and others (2005).* The old growth definitions in *Green and others (2005)* are in two parts. First, there are tables of "Old Growth Type Characteristics". These tables include both "minimum criteria" (minimum age, tree diameter, number of old large trees, and basal area) and "associated characteristics" (ranges of numbers or proportions of broken topped trees, snags, canopy layers, diameter distributions, broken tops, and large down wood). Pages 11 and 12 of *Green and others (2005)* explain that: "The minimum criteria are used to determine if a stand is potentially old growth. Where these values are clearly exceeded, a stand will usually be old growth. The associated structural characteristics may be useful in decision making in marginal cases, or in comparing relative values when making old growth evaluations." *Green and others (2005)* also warns that: "A stand should not be accepted or rejected as old growth simply on the basis of associated characteristics." The associated characteristics are <u>not</u> part of the base old growth definition. Speaking of the minimum criteria, *Green and others (2005)* further says: "**Because of the great variation in old growth stand structures, no set of numbers can be relied upon to correctly classify every stand. . . . Do not accept or reject a stand as old growth based on the numbers alone; use the numbers as a guide.**" *(The previous 2 sentences are the only sentences printed in bold in the entire explanatory text of <u>Green and others (2005)</u>. The purpose of this bold font was to emphasize the importance of what was being said).* Second, on pages 11 and 12, *Green and others (2005)* provides guidance for incorporation of landscape ecology considerations, and a full range of resource values (including human values) in the selection of stands to be managed as old growth. Professional consideration of a complex array of factors is necessary to make old growth stand allocations that also make sense at the landscape scale.

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

From 1990 through 1993 the IPNF did a forest-wide inventory of old growth resources, and worked with local public Forest Watch groups to allocate and map old growth. This is the original source of the IPNF stand-level old growth allocation and map. Since that time, we have continued to update our old growth stand allocation and map as the forest has changed by natural events, and as new information has became available.

In 2001 the Idaho Panhandle National Forest began a comprehensive review of old growth data, and did several years of new field reviews and exams, to incorporate changes in conditions on-the-ground. Various project-level stand examinations also provide updated information. Ongoing review, monitoring and updating of the old growth stand allocation and map results in some changes in allocated old growth stand acres reported in annual monitoring reports over the years, in response to changing conditions on the ground and availability of better information. These changes are evidence that we are working to keep the stand-level allocation current as conditions change on-the-ground. Each year's monitoring report contains the most current old growth stand information available at that time. The stand information below was extracted from our database in June 2007, and represents the approximate situation at the end of 2006. Evaluating this stand-level old growth allocation information together with the FIA old growth estimates provides the most comprehensive picture of old growth amounts on the IPNF.

The IPNF does not do timber harvest that removes allocated old growth stands. We ceased this practice a number of years ago. However, old growth distribution will never be entirely static because forests are living, changing natural communities. Disturbances such as fire, insects, pathogens, and weather events may reduce the amount of old growth in some areas. Meanwhile, other stands will grow and age into old growth status. The IPNF has almost 700,000 acres of mature forest (forests generally dominated by trees 100+ years old), substantial amounts of which have the potential to grow into old growth in the next few decades. We will continue to update our old growth stand data in response to changing conditions on the ground, and as we obtain new information. The priority for our updating efforts will be those watersheds where we are considering management activities.

The IPNF has approximately 6,500 allocated individual old growth stands distributed across 2.5 million acres of National Forest. It is not practical to visit every old growth stand every year. Because natural changes are going on continually (this includes both natural disturbances that remove old growth, and other stands maturing into old growth), information about some individual allocated stands may be outdated at any given time. However, to ensure that all management actions are designed based upon current old growth conditions, whenever any management activity is being considered that could possibly impact old growth, we take a closer look at old growth allocations within the project area. And to ensure that we're meeting Forest Plan old growth standards forest-wide, we use FIA estimates to monitor the amount of old growth across the forest and at other large scales. FIA plots are remeasured on a 10 year schedule.

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

We record old growth stand allocations in the Forest Service Northern Region, Timber Stand Management Record System (TSMRS) database, because there are database fields and codes designed for

recording stand old growth status. TSMRS is a very large Forest Service database used across the Northern Region. Any database is simply an electronic box with pre-defined fields to store specific information items. It is not possible to make meaningful sweeping general statements about the reliability of such a large, widely used database. The completeness and reliability of any specific data items in any database depends upon the local effort devoted to gathering and maintaining that specific information. Since 2001 the IPNF has spent over $320,000 in District-wide reviews and updating of old growth stand information in TSMRS. In addition, for all potential management projects, TSMRS old growth information is subject to additional project area review and validation (as explained above) prior to any management action on the ground. This assures that we don't, inadvertently, take any management action that negatively impacts old growth, and that all our project plans are based on the current old growth status for that project area. Updating old growth allocation information in the Idaho Panhandle National Forests portion of the TSMRS Database is ongoing as the forest changes and new information becomes available.

A single observation somewhere in a stand will never be sufficient for determining old growth status. Because internal heterogeneity is a recognized characteristic of many old growth stands, the condition of the stand as a whole, and its context in the larger landscape all need to be considered in making old growth allocations.

The TSMRS database contains codes indicating individual stand old growth allocation status. The actual stand examination data that's used in old growth determination is found in the FSVEG database, and/or in field notes and other information in the individual stand folders. This information is updated when new exams are done. Larger scale information about landscape context likely also was used in making allocation decisions.

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

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

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

incorporating landscape ecology and other resource considerations (as well as individual tree size, age and density attributes) in allocating land as old growth.

Old growth can be monitored by tallying up acres of stands allocated and mapped as old growth. Totals from the IPNF stand-level map are presented in the following table. Forest Plan Standard 10b calls for maintaining 10% of IPNF forested acres as old growth (231,000 acres). We have identified and allocated 283,727 acres of forest stands (12.3% of IPNF forested acres) to be retained as old growth. This includes 241,390 acres of allocated field identified stands that fully meet old growth minimum criteria (codes 2 and 9) in addition to allocated potential old growth (code 11 – allocated using additional considerations in *Green and others)*. Old growth status in 98.7% of these stands has been field verified at some time by either a stand exam or walk though. Clearly, the IPNF has allocated enough acres of old growth stands to meet and exceed Forest Plan Standard 10b. We also have an additional 7,464 acres (0.3% of forested acres) of previously field examined, unallocated old growth stands, which provides additional old growth habitat for wildlife and serves other ecological functions.

Table 51. Mapped Allocated Old Growth Stands Acres By River Sub-Basin

Sub-Basin (River)	Allocated Ancient Cedar *(code 2)*	Allocated Field Verified Old Growth *(code 9)*	Allocated Photo Inventory Old Growth *(code 10)*	Allocated Potential Old Growth *(code 11)*	Total Allocated Old Growth *(codes 2, 9, 10, 11)*	Additional Field Verified Old Growth *(code 12)*	Total All Old Growth *(codes 2, 9, 10, 11, 12)*
St. Joe	1,963	59,267	732	12,915	**74,877**	7,320	**82,197**
Coeur d'Alene	208	55,279		11,984	**67,471**		**67,471**
Pend Oreille	63	19,990	268	4,892	**25,213**		**25,213**
Kootenai	516	60,501	157	6,842	**68,016**	144	**68,160**
Priest	1,757	41,846	2,445	2,102	**48,150**		**48,150**
Forest Total	**4,507**	**236,883**	**3,602**	**38,735**	**283,727**	**7,464**	**291,191**

Forest Plan Standard 10i. presents "goals for lands to be managed as old-growth" within some forest Plan Management Areas with timber management goals. Only four Management Areas have specific Forest Plan old growth numerical goals. The table below displays both those goals by Management Area, and acres we have currently allocated for old growth. These old growth allocations meet and far exceed these Forest Plan Management Area goals.

Table 52. Acres of Allocated Old Growth Compared to Management Area Goal

Forest Plan Management Area	Management Area goal: "Maintain approximately *xxxxx* acres"	Allocated Old Growth stand acres
1	25,000	99,019
2	6,000	21,899
3	400	1,948
4	4,000	14,199

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

Table 53. Old Growth Habitat Type Series Distribution

Habitat Type Series	% IPNF Acres by Inventoried Habitat Type Series	Allocated Old Growth Acres by Habitat Type Series	% of Allocated Old Growth Acres by Habitat Type Series
Ponderosa Pine	< 0.1%	0	0.0%
Douglas Fir	6.8%	9,377	3.3%
Grand Fir	14.7%	14,893	5.2%
Western Red Cedar	15.9%	51,620	18.2%
Western Hemlock	37.7%	111,498	39.3%
Subalpine Fir	15.2%	53,700	18.9%
Mountain Hemlock	9.7%	42,237	14.9%
Lodgepole Pine	< 0.1%	0	0.0%

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

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

The natural processes that maintained old growth on dry sites were very different than on moister sites. Historically, most of these dry forest habitat types were subject to frequent low-severity underburns and mixed severity fires that thinned out smaller trees and favored large trees of the most fire-resistant species (ponderosa pine and western larch). Frequent low-severity fires reduced the total number of smaller trees (thus limiting moisture stress to large trees on dry sites), and reduced dead woody fuels and live ladder fuel accumulations (thus reducing the risk of stand replacing crown fires). These low and mixed-severity fires were the keystone natural process that maintained dry site old growth forest structures.

Now, on dry habitat types, approximately 70 years of effective fire suppression has allowed in-growth of dense stands of smaller trees and accumulation of high woody fuel loads. Lack of fire has favored Douglas-fir and grand fir over ponderosa pine and larch. The large number of trees in these denser stands creates higher moisture demands than in the historic, fire-maintained open stands. This higher moisture demand stresses the old growth trees during drought years, and predisposes stands to bark beetle

outbreaks. During drought years this can result in unusually high levels of mortality amongst old trees in these unnaturally dense stands. Dense Douglas-fir and grand fir are also more susceptible to root diseases and bark beetles than historic forest structures. Compared to the historic forest, dense Douglas-fir / grand fir stands on dry sites have a lower probability of surviving long enough to become old growth. Those dry site fir stands that do old reach old growth age are less likely to be as resilient and persistent as the historic old growth structures. In addition, during fires the dense small trees in the understory serve as fuel ladders that carry flames into the upper canopy of large old trees. This new situation creates an unnaturally high risk of stand replacing crown fire, which will kill old trees that historically were able to survive surface fires. Decades of fire suppression on dry sites has transformed stand structures in a way that threatens the continued existence of old growth on these dry sites, and reduces the chances of current younger stands surviving long enough to become old growth.

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

Summary -- Comparison of Two Tools for Monitoring Old Growth

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

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

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

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

- **Based on FIA data, the current estimate of the proportion of old growth on the forested IPNF lands is 11.8%. (90% confidence intervals of this estimate are 9.6% to 14.0%).**
- **The IPNF total acres of mapped stands allocated and retained for old growth is 12.3% of forested lands.**

The percent of forested acres of stands mapped and allocated for old growth is well within the 90% confidence interval of the FIA inventory. From a statistical perspective, at the 90% confidence

level, the two numbers are not significantly different. Together, these two monitoring tools offer compelling evidence that the IPNF is meeting Forest Plan standards for the amount of old growth to be retained.

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

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

Environmental Management System

In 2006, the IPNF established an Environmental Management System (EMS) under International Standard (ISO) 14001. This effort was in response to requirements in the 2005 Planning Rule and the Executive Order 13148-Greening the Government through Leadership in Environmental Management (since superceded by Executive Order 13423). In general, an EMS is a structure of procedures and policies used to systematically identify, evaluate, and manage environmental impacts of ongoing activities, products, and services. The EMS is proactive and prevention-driven. It works to prevent the occurrence of regulatory non-compliance and identifies opportunities for improvement and pollution prevention. EMS employs a continual cycle of planning, implementing, reviewing, and improving the processes and actions that an organization undertakes to meet its environmental goals. Most EMSs, including the IPNF's, are built on the "Plan, Do, Check, Act" model. This model leads to continual improvement based on:

- Planning, including identifying top environmental issues and establishing goals [plan];
- Implementing, including training and operational controls [do];
- Checking, including monitoring and corrective action [check]; and
- Reviewing, including progress reviews and making needed changes to the EMS [act].

A key concept of an EMS is "say what you do, and do what you say". An EMS employs a continuous, self-monitoring cycle for continual improvement of environmental performance. Improvement is achieved by identifying how the activities, products, and services interact with the environment to cause environmental impacts; by establishing and maintaining environmental objectives and targets; by training staff and clearly defining responsibilities; by instituting operational controls, and monitoring; and by taking corrective action when necessary to avoid and reduce adverse impacts, using the plan-do-check-act model.

The scope of the IPNF EMS currently includes land management planning as well as activities and operations on the ground. Geographically the scope includes activities affecting the environment, such as livestock grazing, recreation uses, mining, timber harvest, fire suppression, and fire use, which take place within the administrative boundaries of the IPNF. Currently, the IPNF EMS does not include the administrative functions (facilities, fleet, recycling, etc.), but is expected to by 2008.

An environmental policy statement serves as the foundation for an EMS. The IPNF's environmental policy is the same as the Forest Service-wide policy stated in Forest Service Manual 1331 – Environmental Management System:

> In conjunction with its mission (FSM 1020.21), vision (FSM 1020.22), and guiding principles (FSM 1021) *the Forest Service is committed to complying with applicable legal and other requirements, pollution prevention, and continual environmental improvement*.

The international standard requires that an organization identify environmental aspects of its activities that are within the defined scope of the EMS (land management planning as well as activities and operations on the ground) that it can control or influence and determine which are significant to the organization.

Environmental aspects are defined as how an organization's activities, products and/or services interact with the environment. An impact is how an aspect changes the environment. The intent is to help the organization identify how it affects the environment, prioritize aspects, and use the EMS to manage, control, and improve upon the aspects. So the organization must ensure that the significant aspects are

taken into account in the EMS and kept up-to-date. For the purposes of our EMS, the IPNF has identified the following as significant aspects:

1) **Timber harvest** (including log hauling) and the impacts on:
   - Native wildlife habitat,
   - Grizzly bear or elk security,
   - Watershed condition and aquatic habitats,
   - Soil productivity, and
   - Invasive weed introduction or spread.

2) **Fire suppression and wildland fire use** activities and the impact on:
   - Invasive weed introduction or spread.

3) **Motorized travel on roads, trails and areas** and the impact on:
   - Invasive weed introduction or spread,
   - Grizzly bear or elk security, and
   - Watershed condition and aquatic habitats.

These aspects reflect areas where we want to ensure we are controlling or preventing impacts and making continual improvement. Operational Controls (methods to control or prevent impacts) and monitoring ("say what you do, and do what you say") are utilized to address and measure impacts from these significant aspects. For example, to reduce and monitor the potential impacts from timber harvest, the timber harvest operational control relies on the direction and guidance found in the IPNF Land Management Plan, the Forest Service Manual, and Forest Service Handbooks.

An environmental aspect can have many impacts. Some can be negative (as described above) and others can be positive, such as improved growth of trees, reduction of fuel loads and risk of wildfire, reduced invasive weed introduction or spread, or reduced impacts from the existing road system on water quality and aquatic habitats.

The international standard requires organizations to establish, implement, and maintain environmental objectives, targets, and programs that are consistent with the organization's environmental policy (comply with applicable legal and other requirements, pollution prevention, and continual environmental improvement). The IPNF established EMS objectives, targets and programs that were based on its environmental policy, legal and other requirements, and environmental aspects. Those environmental aspects with positive impacts were considered as candidates for objectives because those aspects reflect activities that improve or restore the environment. These objectives, targets and programs are enlisted to continually improve the forest's environmental performance while considering available technology, budget allocations, work force, and public concerns. The following objectives were tracked by the forest in 2006:

1) Invasive Weeds Objective:

- **Reduce invasive weed introduction or spread through improved and more effective control and management**

Table 54. 2006 Invasive Weed Treatment Target

Treatment Type	FY 2006 Target of Infested Area to be Treated (acres)	Accomplishment (acres)
Pesticide Application	3,960	4,249
Biocontrol - Insects	175	255
Biocontrol - Livestock	---	
Mechanical/Physical	15	19
Cultural	20	49
TOTAL	**4,170**	**4,572**

2) Vegetation Management:

- **Objective 1 - Restore or maintain vegetation health (consistent with fire-adapted vegetation composition, function and structure relative to desired conditions) including the improvement or maintenance of resilient, native wildlife habitat;**

Table 55. 2006 Vegetation Management Objective 1 Target

Task		
	FY 2006 Target (acres)	Accomplishment (acres)
Planted	2,100	2,973
Natural regeneration certified as stocked	100	244
Intermediate harvests – reported out as a target for sold as opposed to harvest	2,730	1,629
Precommercial thinning	1,620	1,768
Prescribed burning (stand replacement for grasslands or underburning within forestlands.)	139	134
Weed treatment on grassland	0	0
Noncommercial mechanical fuels treatment	190	250
TOTAL	**6,879**	**6,998**

- **Objective 2 - Reduce fuels in a pattern and location to decrease fire intensity in the proximity of WUI or Community Wildfire Protection Plan areas.**

Table 56. 2006 Vegetation Management Objective 2 Target

Task		
	FY 2006 Target (acres)	Accomplishment (acres)
Timber harvest (both regeneration harvest and intermediate harvests)	3,600	3,674
Noncommercial mechanical fuels treatment	190	6,836
Prescribed fire	139	1,977
Precommercial thinning	98	Included in line 2 above
TOTAL	**4,027**	**12,487**

3) Travel Management:

- **Objective 1 - Reduce the existing road systems' contributed sediment and impairment of water quality and aquatic habitats[1]**

Table 57. Decommission unneeded roads

Target	Accomplishment
5	50

Table 58. Treat roads to improve water quality*

Target	Accomplishment
6	1,775

*Miles of road receiving improvements that meet State developed forestry Best Management Practices (BMPs)

Table 59. Miles of roads treated in intermittent stored service to achieve a hydrologically stable condition

Target	Accomplishment
0	0

Table 60. Reduce the number of road-stream crossing fish barriers

Target	Accomplishment
1	1

- **Objective 2 - Improve security for grizzly bears and elk through the designation of roads, trails and areas for motor vehicle use[2]**

Table 61. Publish Map of Designated Roads, Trails and Areas

Target Acres	Accomplished Acres
0	0

In order to properly manage the environmental management system, measurements must be taken of the environmental performance and provide data to assure conformance or for making improvements. Procedures are required to describe how the forest will check and measure the key parameters of its operations. These parameters include activities related to: 1) Controlling impacts resulting from the significant aspects (timber harvest, fire suppression/wildland fire use, and motorized travel); 2) Achievement of the objectives and targets (invasive weeds, vegetation management, and travel management); and 3) Conformance with applicable legal and other requirements.

Procedures to monitor and measure each of the activities associated with the identified significant environmental aspects and related specified impacts were identified and incorporated into the operational controls for timber harvest, fire suppression/wildland fire use, and motorized travel. Monitoring achievement of objectives and targets involves development of a program of work and periodically checking to see that progress is being made throughout the year. Adjustments are made to the program as needed to ensure continuing progress.

[1] This objective is focused on the existing road system and how it affects water quality and aquatic habitat.
[2] This objective is focused on controlling the effects of motorized travel on grizzly bear and elk security.

The evaluation of compliance with applicable laws and other requirements is an on-going process. Compliance checks occur in three primary ways: 1) Pre-action compliance checks; 2) Compliance checks conducted during activity implementation; and 3) Post-action compliance evaluations.

In 2006, the IPNF evaluated its compliance with the following laws and other requirements:

1) The Endangered Species Act Section 7(a)2;
2) Forest Service Manual Sections 2620.3, 2630.3, and 2672.4;
3) The Clean Water Act, Executive Order 11988, and Executive Order 11990
4) Forest Service Manual 2550 Soil Quality Standards;
5) NFMA, 5 year reforestation requirement;
6) Procedures documented in Forest Service Handbook 2409.17, Silvicultural Practices Handbook, Chapter 2, Reforestation; and
7) The Clean Air Act, EPA NAAQS; ID and WA DEQ SIP.

Compliance check results identified the need for: 1) A closer tie between NEPA design criteria and the timber sale contract; 2) An interdisciplinary approach to compliance checks for water, soils and fisheries with the sale administrator present; and 3) Providing training and clarifying the requirements of the NFMA five year reforestation requirement.

In addition to the previously discussed checking and monitoring, the international standard requires that the environmental management system provide for internal audits. The purpose of this conformance audit is to check whether the system conforms to the requirements of the international standard and the IPNF's own EMS requirements, and if the EMS has been properly implemented and maintained. It looks at how legal and regulatory compliance issues are being managed[3]. An audit was required prior to the forest considering its EMS "established". For the EMS to be considered established, the audit had not to identify any major non-conformances with the international standard or the forest's EMS requirements.

The IPNF audit identified ten instances of non-conformance where the forest needed to take corrective action to improve conformance with its EMS. None of the findings were identified as being a major non-conformance; therefore, the forest's EMS was considered established. In 2007, the forest will be implementing corrective actions to remedy the identified minor non-conformances from this audit.

The "act" of the plan-do-check-act model occurs when the forest's leadership team conducts planned, formal reviews of the EMS at least once a year. The purpose of the management review is to ensure the continuing suitability, adequacy and effectiveness of the EMS. During these reviews, information is provided to the leadership team on the performance of the EMS, its ability to meet the commitments stated in the EMS policy, and suggested recommendations for change.

[3] This is different than an environmental *compliance* audit, which focuses on environmental compliance to legal and regulatory requirements. The compliance audit *verifies* whether actual legal and regulatory requirements are being met.

Appendices

A. Forest Plan Monitoring Requirements

B. Programmatic Forest Plan Amendments

C. List of Contributors

D. Water Quality Monitoring Results

Appendix A. Forest Plan Monitoring Requirements

Table 62. 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-6	**Actual sell area and volume**	Cut and sold reports	Annually	5 years accumulation	Sell volume and acres less than 75% of FP goal
C	VISUAL RESOURCES				
C-1	**Meeting visual quality objectives**	EAs, field sampling	Ongoing	Annually	10% departure from Forest Plan direction after 5 years initiates further evaluation
D	RECREATION				
D-1	**Off-road vehicle effects**	Field evaluation, travel plan	Continuing	Annually	Conflicts with management area goals or between users
E	CULTURAL RESOURCES				
E-1	**Measure potential impacts of land disturbing projects on known cultural resources**	Field monitoring	Annually	Annually	Any unmitigated adverse impact

Item Number	Standards, Practices, Activities, Outputs or Effects to be Monitored	Data Source	Frequency of Measurement	Reporting Period	Threshold to Initiate Further Action
F	WILDLIFE				
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[4]	**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 four year declining trend on any stream
G-2	**Are BMPs protecting water quality, are they: implemented as designed; effective in controlling non-point sources of pollution; protecting beneficial uses.**	Baseline stations on 11 streams. Implementation 10% timber sales; Effectiveness on-site 0ff-site measurement; WATSED validation	Annually	Annually	1 – used for resource characterization and background data for predictive purposes 2- Evaluate 10% of timber sales per year. Deviation from prescribed BMPs; 3- Ineffective on-site non-point 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-4	**Fish Population trends – cutthroat trout**	Cooperative with Idaho Fish and Game	2 years	2 years	Downward trend
H	THREATENED AND ENDANGERED PLANTS				

[4] This monitoring item was amended from the forest plan in June 2005 (see *Fry Emergency Amendment Decision Notice and Finding of No Significant Impact*, June 2005).

Item Number	Standards, Practices, Activities, Outputs or Effects to be Monitored	Data Source	Frequency of Measurement	Reporting Period	Threshold to Initiate Further Action
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
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 analysis, an area analysis, or a project specific analysis that supports the need for change. Programmatic amendments may be proposed as a result of new information or changed conditions, actions by regulatory agencies, monitoring and evaluation, or landscape analysis. These amendments may affect Forest-wide or management area direction.

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

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

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

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

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

5) Another amendment is associated with the Interim Strategies for Managing Fish-producing Watersheds in eastern Oregon and Washington, Idaho, western Montana and portions of Nevada (Inland Native Fish Strategy). This interim direction is in the form of riparian management objectives, standards and guidelines, and monitoring requirements. This action amends the management direction established in the Regional Guides and all existing land and resource management plans for the area covered by the assessment. The Decision Notice for the Environmental Assessment that covered this amendment was signed by the Regional Foresters for the Northern, Intermountain and Pacific Northwest Regions on July 28, 1995.

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

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

8) The most recent amendment modified or removed from the forest plan certain objectives, standards and monitoring requirements pertaining to fry emergence (fish). The decision notice for this amendment was signed by Deputy Forest Supervisor on June 2, 2005.

Appendix C. List of Contributors

The following individuals contributed information to this report:

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Appendix D
Water Quality Monitoring Results

Priest Lake Ranger District

Jill J. Cobb
District Hydrologist

Willow Creek Aquatic Restoration

The Willow Creek Aquatic Restoration project was implemented over the summer of 2005. The project is located in the State of Washington, in the headwaters of the North Fork of Granite Creek. The work included road obliteration of 11.9 miles of logging roads and removal of 85 culverts – 18 live culverts, 62 relief culverts, and five fish bearing culverts. Prior to treatment, the United States Forest Service staff had documented mass failures and failed culverts over the length of the road. Portions of the original road network had been removed earlier under the Kalispell Granite Bear Management Access Plan in 1997. The remaining road segments posed a risk to water quality and ultimately to downstream fisheries.

Funding for the project was secured through support from the following groups from the State of Washington: The Salmon Recovery Funding Board, Washington Department of Fish and Wildlife and the Kalispel Tribe. Unlike most projects, the USFS provided only about 13% of the total funding to complete this job. The balance of the funding was provided by the SRFB grant and the Kalispel tribe.

Two research projects were woven into the project to address effectiveness of various erosion control mediums and the effects of culvert removal on inchannel turbidity. All studies were developed and are under the close supervision of Dr. Randy Foltz, Researcher from the USFS Rocky Mountain Research Station out of Moscow, Idaho. Since the completion of the project, the RMRS has published the outcome of both studies.

In addition to the actual removal of culverts and recontouring of slopes, funds were also used to stabilize the exposed soils with mulch and seed. Working closely with the Salmon Recovery Funding Board team out of Washington State, we received approval to use a small portion of the funds to perform two studies. Preliminary results of the studies have been published. The first study documented the amount of sediment suspended during and after a culvert is removed.[5] The second study is longer term and focuses on the effectiveness of various mediums for erosion control. [6]

Project Goals

When the Willow Creek project was originally developed, there were five primary goals.

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[5] Foltz, Randy B, Kristina A. Yanosek and Timothy M. Brown. 2007. Sediment concentration and turbidity changes during culvert removals. Journal of Environmental Management. 12 pages.

[6] Foltz, Randy B. and Natalie S. Copeland. 2007. Field Testing of Wood-based Biomass Erosion Control Materials on Obliterated Roads. Paper Number: 078046. Written for presentation at the 2007 ASABE Annual International Meeting Sponsored by ASABE Minneapolis Convention Center Minneapolis, Minnesota 17 - 20 June 2007. 9 pages.

1. Increase accessible fish habitat
2. Reduce sediment delivery to streams
3. Improve fish habitat
4. Improve grizzly bear habitat
5. Support research for future road work

The five goals were met via the decommissioning of roads 1122 and 1124 in the Willow Creek and North Fork Granite drainages and implementation of Best Management Practices. For several years, these roads and the stream crossings were actively failing and threatening aquatic resources. As a result of this project, 11.9 miles of road were decommissioned and 85 culverts removed. A preliminary survey of the road network showed 69 culverts that would be removed. Of the 69 culverts, 5 were large fish migration blocks. Additionally, the entire area was treated for noxious weeds prior to any project implementation. Post treatment, all disturbed soils were mulched with certified weed free hay and seeded with a carefully selected seed mix[7]. The mulch was applied at about 5 bales per mile and the seed and fertilizer was applied at 35 lbs/acre and 50 lbs/acre, respectfully. The spring following the initial work, the Forest Service planted 3,000 White Pine seedlings trees on the old road prism. The entrance to the road was camouflaged with boulders and logs to disguise the road and yet allow hikers to access the site via a primitive trail.

Effectiveness:

Revegetation: It appears that the seeding, fertilizing and mulching were very successful at controlling overland flow and minimizing the establishment of noxious weeds. The planting of the 3,000 white pine in the wet spring of 2006 was almost 100% survival. Other native shrubs and trees are appearing on the treated areas as well.

Channel Stability: Most of the crossings where culverts were removed are stable and met the project objectives. However, at about 10 of the 85 crossings, the operator left over-steepened banks, did not pull back the channel widely enough and did not match the original channel grades. At these locations, we observed that the stream flows during spring runoff eroded the toes of the over-steepened channel banks, causing the banks to fail into the channels. After two years of healing, the channel banks are gradually stabilizing. Much of the problem is attributed to the lack of technical oversight during those few culvert removals. The operator could not see from his vantage on the excavator that the work was insufficient and by the time the inspector could review the work, the operator was too far away to correct the problem without causing damage to the work. In some instances where it was feasible (and caught in time), the operator was made to go back and correct those situations.

Inchannel Structures: At the larger channel crossings (such as the crossings on the North Fork of Granite and Willow Creek), inchannel structures were constructed to minimize downcutting, provide channel stability and enhance habitat. At the base and head of the larger crossings, 1.5 foot diameter rocks were completely buried in the channels to create grade control structures. These grade control structures were highly effective at halting the downcutting of the channels. Large wood placed in and across the channels effectively sorted bedload and created inchannel pools.

[7] Seed Mix: Silver Lupine, Mtn Brome, Slender Wheatgrass, Sheep Fescue, Canada Bluegrass, Blue Flax, Annual Ryegrass

Preliminary Research Results:

Erosion Control Mediums: Randy Foltz (RMRS) published the preliminary findings of the comparison of the various erosion control mediums. In the study, wood straw, agricultural straw and wood strands (also know as hog fuel) were compared to bare plots. After two years of monitoring, Dr. Foltz has found that mitigation in the first year from wood strand and agricultural straw treatments were near 80 percent and wood shreds at 41 percent. After the first year, the wood shreds and straw treatment plots lost a significant amount of cover material. Shreds treatments had an average decrease of 36% in initial ground cover and straw had an average decrease of 29%. The wood strands treatment did not have a significant change in cover over this time period. In summary, wood straw and agricultural straw yielded similar results of 80% mitigation for soil erosion in the first year. However, only the wood straw was visible and still reducing erosion into the second year. Dr Foltz has not yet published the results of the sediment pulses that corresponded to the culvert extractions.

Sediment Concentration and Turbidity During Culvert Removals:
As part of the Willow Creek effort, Dr. Foltz used ISCO samplers to monitor the effects of pulling culverts on three stream crossings. This study was part of a larger study that Dr. Foltz completed in the northwest that studied eleven separate culvert removals. According to the data, sediment concentration immediately below the culvert outlet exceeded levels above the culvert outlet by at least three orders of magnitude at all stream crossings during the culvert removal. In the larger study, Foltz found that sediment yields ranged from 170 to less than 1 kg in the 24-hour period following culvert removal. Foltz found that turbidity levels exceeded the regulatory limits during culvert removal at all locations monitored in this study and remained above the limits beyond the monitoring periods of 24 hours at four of the eleven study sites. Sediment concentrations 100 meters downstream of the culvert outlet were reduced by an order of magnitude, but did not change the turbidity values sufficiently to meet regulatory limits. Of particular interest is that Foltz found that sediment concentrations returned to baseline levels just 810 meters downstream of the culvert sites. The sediment concentrations registered at the 810 meter sites were similar to sediment concentrations above the culverts for the entire excavation period and at all times turbidity regulations were met. Foltz also found that mitigation consisting of two straw bales placed in the stream caused a significant reduction in sediment yield from an average of 67 kg to an average of 1.6 kg.

Closure to Motorized Vehicles: The site is not accessible to any motorized vehicles. At the beginning of the road, large (5 foot plus diameter) boulders prevented ATV access but allowed for easy foot travel. The road beyond the blockage was recontoured to give the appearance that there was no road prism for as far as one could see from the beginning of the road. From the numerous field reviews, it appears that while hikers (and perhaps hunters) are using the area, there is no motorized access on the treated road prisms.

Meeting of the original goals: The five original goals were met with the implementation of the Willow Aquatic Restoration Project.

1. *Increase accessible fish habitat:* Available fish habitat increased from 1,800 acres to 6,900 acres
2. *Reduce sediment delivery to streams:* Long term sediment production off of the failing road system was arrested. It is estimated that hundreds of tons of overburden over the culverts was prevented from reaching fish bearing waters
3. *Improve fish habitat*: The careful placement of wood and boulders in the channels at fish bearing crossings enhanced fish habitat.
4. *Improve grizzly bear habitat:* According to the project Wildlife Biologist, this project provided critical core grizzly bear habitat to the Kalispell Bear Management Unit.

5. *Support research for future road work*: Research documenting the effectiveness of our management actions continues to improve our ability to provide products to the public with an eye towards cost containment.[8]

Application of BMPs: Mulch	Revegetation of Treated Road Prism
	

Erosion Control Research Project	North Fork Channel Crossing: Post Treatment
	

[8] Foltz, Randy B. and Natalie S. Copeland. 2007. Field Testing of Wood-based Biomass Erosion Control Materials on Obliterated Roads. Paper Number: 078046. Written for presentation at the 2007 ASABE Annual International Meeting Sponsored by ASABE Minneapolis Convention Center Minneapolis, Minnesota 17 - 20 June 2007. 9 pages.