Idaho Panhandle National Forests

FOREST PLAN

MONITORING AND EVALUATION REPORTS

2012, 2013 and 2014

Idaho Panhandle National Forests
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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 2014.

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. Twenty items are included in this report:

A-1	Outputs of Goods and Services
A-2	Effects on and of National Forest Management
B-1	Harvested Land Restocked within Five Years
B-2	Timberland Suitability
B-3	Validate Maximum Size Limits for Harvest Areas
B-4	Insect and Disease Hazard
B-5	Road Construction
B-6	Actual Sell Area and Volume
D-1	Off-Road Vehicles
E-1	Heritage Resources
F-1	Population Trends of Indicator Species
F-2	Grizzly Bear Recovery
F-3	Caribou Recovery
G-2	Water Quality
G-3	Fish Habitat Trends
G-4	Fish Population Trends (bi-annual)
H-1	Threatened, Endangered and Sensitive Plants
I-1	Minerals
J-1	Land Ownership Adjustments
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. For this report, these subjects include ecosystem restoration, old growth, and snags.

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 2012, 2013, and 2014 respectively: 46.0 MMBF, 39.6 MMBF, and 45.0 MMBF were offered; 45.2 MMBF, 40.2 MMBF, and 43.7 MMBF were sold; and 28.1 MMBF, 52.6 MMBF, and 41.3 MMBF were harvested. The number of acres sold for harvest in 2012, 2013, and 2014 was 3,693, 2,453, and 2,062. Payments to counties in fiscal year 2012, 2013, and 2014 totaled $5,799,426, $5,586,589, $5,089,820, respectively.

- The woodland caribou population has declined when compared to survey estimates from previous years. Twenty-seven, 27, and 18 caribou were documented from the winter census in 2012, 2013 and 2014; respectively. For 2014, twelve of fifteen Grizzly Bear Management Units met core and road density standards.

- 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 2012, 2013 and 2014 are listed below. (Note: See the Ecosystem Restoration section of this report for more details.)

    - Planting approximately 234,183, 458,418, and 250,300 rust resistant white pine seedlings.

    - Planting approximately 888, 1,427, and 940 acres of white pine, larch and ponderosa pine. These are species that are in short supply on the IPNF.

    - Reducing forest density by thinning 1,610, 1,284, and 2,246 acres, most of this released larch, white pine and ponderosa pine.

    - Pruning 1,970, 1,997, and 1,817 acres of white pine saplings. This reduces mortality from white pine blister rust.

    - Integrated weed treatments were accomplished on 3,039, 2,367, and 3,473 acres.

    - There were 2,500, 2,421, and 2,271 acres of harvest related fuel reduction and 6,135, 2,575, and 1,700 acres of natural fuel reduction.

    - Improving 635, 1,869, and 705 acres of soil and water resources in the last three fiscal years.

    - Decommissioning 17.1 miles, 31.2 miles, and 80 miles of road.

- Forest plan standards call for us to maintain 231,000 acres of old growth (10 percent of our forested acres). For 2014, the estimated percentage of old growth on all forested lands on the IPNF, using Forest Inventory and Analysis (FIA) data, is 12.1 percent with a 90% confidence interval of 9.8 to 14.5 percent.

Table 1 is a quantitative summary of some of the forest's other accomplishments for fiscal years 2012, 2013, and 2014.

Monitoring Items

This section contains the monitoring and evaluation results for fiscal years 2012, 2013, and 2014 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	Quantitative Estimates	Quantitative Estimates
	2012	**2013**	**2014**
Budget	$24,008,679.00	$24,199,861.00	$27,402,000.00
Total number of employees	280	300	306
Volume of timber offered	46.0 MMBF	39.6 MMBF	45.0 MMBF
Volume of timber sold	45.2 MMBF	40.2 MMBF	43.7 MMBF
Volume of timber harvested	28.1 MMBF	52.6 MMBF	41.3 MMBF
Total acres of timber sold	3,693 acres	2,453 acres	2,062 acres
Payments to counties	$5,799,426.00	$5,586,589.00	$5,089,820.00
Total reforestation completed	888	1,427	940
Total number of white pine seedlings planted	92,706	96,977	72,428
Timber stand improvement completed (pre-commercial thinning and release)	1,610 acres	1,284 acres	2,246 acres
Pruning of white pine	1,970 acres	1,997 acres	1,817 acres
Soil and water improvement completed	635 acres	1,869 acres	705 acres
Roads maintained	625 miles	696 miles	749 miles
Roads constructed	2 miles	11 miles	3 miles
Roads reconstructed	39 miles	144 miles	70 miles
Roads decommissioned	17 miles	31 miles	80 miles
Trails constructed/reconstructed	0.3/95 miles	6.3/50 miles	0/118 miles
Trails maintained	2,462 miles	1,135 miles	1,130 miles
Number of wildfires	57	100	98
Acres burned by wildfire	30 acres	1,737 acres	248 acres
Harvest related fuel treatment	2,500 acres	2,421 acres	2,271 acres
Hazardous fuels reduction	6,135 acres	2,575 acres	1,700 acres
Wildlife habitat enhanced	6,892 acres	3,740 acres	4,928 acres
Noxious weeds treated	3,039 acres	2,367 acres	3,473 acres
Abandoned/inactive mines	5	3	10

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.

Payments to Counties

In the past, the Forest Service paid out twenty-five 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. The following table compares payments to counties with harvested timber volume.

Table 2. Payments to Counties with Harvested Timber Volume

Fiscal Year	Payments (MM$)	Volume (MMBF)	Fiscal Year	Payments (MM$)	Volume (MMBF)
1991	5.4	232	2003	8.1	53
1992	7.4	235	2004	8.2	40
1993	6.0	134	2005	8.5	37
1994	6.4	117	2006	8.6	16
1995	5.8	87	2007	8.6	28
1996	6.0	81	2008	8.7	24
1997	3.9	57	2009	7.8	17
1998	4.8	85	2010	6.9	20
1999	3.1	75	2011	6.4	26
2000	4.0	90	2012	5.8	28
2001	8.0	51	2013	5.6	53
2002	8.1	41	2014	5.1	41

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 IPNFs for fiscal year 2000 was collection of $15,248,318.73. Timber volume harvested in fiscal year 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, 9, 10, 11, 12, 13, 14, 15, 16, and 17 which follow show the same information for fiscal years 2002 through 2014.

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	7.5/7.5	$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	15/0	$159,966.47	$0
Shoshone	$4,112,394.21	15/0	$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	7.5/7.5	$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	7.5/7.5	$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	15/0	$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	14/1	$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	15/0	$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	14.25/0.75	$595,897.04	$31,363.00
Total	**$8,207,237.81**		**$1,167,079.74**	**$64,005.93**

Table 10. Distribution of Payments to Five Northern Idaho Counties, Fiscal Year 2007

County	Total Disbursement	% Split Title II/Title III	Title II (Forest Projects)	Title III (County)
Benewah	$122,938.66	15/0	$18,478.72	$0
Bonner	$1,368,531.86	15/0	$198,678.09	$0
Boundary	$1,447,819.37	12.75/2.25	$184,595.97	$32,575.94
Kootenai	$1,077,952.90	0/15	$0	$161,692.93
Shoshone	$4,173,456.56	14.25/0.75	$594,717.56	$31,300.92.00
Total	**$8,190,699.35**		**$996,470.34**	**$225,569.79**

Table 11. Distribution of Payments to Five Northern Idaho Counties, Fiscal Year 2008

County	Total Disbursement	% Split Title II/Title III	Title II (Forest Projects)	Title III (County)
Benewah	$118,313.00	0/15	$0	$17,747
Bonner	$1,262,235.00	15/0	$183,245.00	$0
Boundary	$2,561,640.00	15/0	$384,246.00	$0
Kootenai	$778,346.00	15/0	$116,752.00	$0
Shoshone	$3,830,536.00	12.5/2.5	$478,817.00	$95,764.00
Total	**$8,551,070.00**		**$1,163,060.00**	**$113,511.00**

Table 12. Distribution of Payments to Five Northern Idaho Counties, Fiscal Year 2009

County	Total Disbursement	% Split Title II/Title III	Title II (Forest Projects)	Title III (County)
Benewah	$98,712.00	0/15	$0	$14,806
Bonner	$1,085,274.00	15/0	$162,790.00	$0
Boundary	$2,290,170.00	15/0	$345,525.00	$0
Kootenai	$693,703.00	11.25/3.75	$78,041.00	$383.00
Shoshone	$3,295,634.00	12.5/2.5	$411,954.00	$82,390.00
Total	**$7,463,493.00**		**$998,310.00**	**$97,579.00**

Table 13. Distribution of Payments to Five Northern Idaho Counties, Fiscal Year 2010

County	Total Disbursement	% Split Title II/Title III	Title II (Forest Projects)	Title III (County)
Benewah	$86,776.00	0/0	$0	$0
Bonner	$1,036,254.00	15/0	$155,438.00	$0
Boundary	$1,822,174.00	15/0	$273,326.00	$0
Kootenai	$654,217.00	10.25/5	$67,057.00	$31,075.00
Shoshone	$3,024,868.00	8/7	$241,989.00	$211,740.00
Total	**$6,624,289.00**		**$737,810.00**	**$242,815.00**

Table 14. Distribution of Payments to Five Northern Idaho Counties, Fiscal Year 2011

County	Total Disbursement	% Split Title II/Title III	Title II (Forest Projects)	Title III (County)
Benewah	$80,045.00	0/0	$0	$0
Bonner	$989,627.00	15/0	$148,444.00	$0
Boundary	$1,648,263.00	14/1	$232,405.00	$14,834
Kootenai	$620,704.00	13/2	$80,691.00	$12,414.00
Shoshone	$2,779,215.00	8/7	$222,337.00	$194,544.00
Total	**$6,452,760.00**		**$733,455.00**	**$222,452.00**

Table 15. Distribution of Payments to Five Northern Idaho Counties, Fiscal Year 2012

County	Total Disbursement	% Split Title II/Title III	Title II (Forest Projects)	Title III (County)
Benewah	$75,131.00	0/0	$0	$0
Bonner	$950,660.00	15/0	$142,599.00	$0
Boundary	$1,420,326.00	15/0	$213,049.00	$0
Kootenai	$587,888.00	15/0	$88,183.00	$0
Shoshone	$2,450,997.00	8/7	$196,080.00	$171,570.00
Total	**$5,485,002.00**		**$686,355.00**	**$171,570.00**

Table 16. Distribution of Payments to Five Northern Idaho Counties, Fiscal Year 2013

County	Total Disbursement	% Split Title II/Title III	Title II (Forest Projects)	Title III (County)
Benewah	$65,718.00	0/0	$0	$0
Bonner	$878,859.00	15/5	$131,828.00	$43,943.00
Boundary	$1,421,843.00	15/0	$213,277.00	$0
Kootenai	$567,585.00	15/0	$85,138.00	$0
Shoshone	$2,365,903.00	8/7	$189,272.21	$165,613.00
Total	**$5,586,589.00**		**$661,827.00**	**$210,247.00**

Table 17. Distribution of Payments to Five Northern Idaho Counties, Fiscal Year 2014

County	Total Disbursement	% Split Title II/Title III	Title II (Forest Projects)	Title III (County)
Benewah	$66,280.00	0/0	$0	$0
Bonner	$835,264.00	15/5	$125,290.00	$41,763.00
Boundary	$1,246,552.00	15/0	$186,983.00	$0
Kootenai	$520,393.00	15/0	$78,059.00	$0
Shoshone	$2,140,182.00	8/7	$171,215.00	$149,813.00
Total	**$4,808,671.00**		**$561,547.00**	**$191,576.00**

Forest Service Employment

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.

Table 18. Total Number of Forest Service Employees

Fiscal Year	Employees	Fiscal Year	Employees
1991	714	2003	486
1992	762	2004	510
1993	743	2005	468
1994	669	2006	421
1995	575	2007	415
1996	552	2008	376
1997	525	2009	379
1998	514	2010	399
1999	526	2011	320
2000	486	2012	280
2001	475	2013	300
2002	470	2014	306

Evaluation: Table 18 shows how the forest workforce has changed from 1991 to 2014. In fiscal year 1992, employment was at a high of 762 permanent and temporary employees and decreased to 306 at the end of fiscal year 2014. 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-1: Harvested Lands Restocked in Five Years

The National Forest Management Act specifies that Forest Plans should "insure that timber will be harvested from National Forest System lands only where…… there is assurance that such lands can be adequately restocked within five years after harvest." To comply with this provision, the 1987 IPNF Forest Plan identified lands suitable for timber harvest that could meet this provision. To monitor compliance, item B-1 in the 1987 Forest Plan Monitoring Requirements specifies that we report every five years on the percent of harvested lands restocked within five years. The identified monitoring threshold for further action is: "10% of harvested lands not adequately stocked 5 years following site preparation."

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

The last time we reported on five year restocking success was in our 2008 Monitoring Report. At that time the IPNF reported on 21 years of data with a five year reforestation success rate that averaged 98%. The next five year report on restocking success was due as part of the 2013 monitoring report. This document includes 2013 report information. Based on the data in this report, we conclude that that the IPNFs is capable of restocking harvested lands within five years.

Table 19. Planted Acres Currently Satisfactorily Stocked

Harvest Year	Currently Progressing or Certified (% acres)	Harvest Year	Currently Progressing or Certified (% acres)
1983	100%	1996	100%
1984	100%	1997	100%
1985	100%	1998	100%
1986	100%	1999	98%
1987	100%	2000	98%
1988	99%	2001	92%
1989	100%	2002	97%
1990	100%	2003	83%
1991	100%	2004	99%
1992	100%	2005	94%
1993	100%	2006	93%
1994	100%	2007	86%
1995	99%	2008	92%
		26 year average (%)	97%

Forest Plan Monitoring Item B-2: Timberland Suitability

During the development of the 1987 Forest Plan, a determination was made on what lands were suitable for timber management. That determination was often based on broad-scale inventory data without the benefit of field verification. In the 1987 Forest Plan (Appendix M), it was acknowledged that during the planning for site specific timber management projects, on-site inspections might identify needs and/or opportunities to further refine the suitability determinations. Therefore, any project specific recommended changes to timberland suitability (suitable land that was actually unsuitable, or unsuitable land that was actually suitable) were to be noted. The monitoring threshold that was established in the Forest Plan was a 10 percent change in the 1,584,163 acres of timberland classed as physically suitable for timber production (a 158,416 acre change).

The following table contains a summary of the changes to timberland suitability that were recommended during the period of fiscal years 2012 through 2014. The total of timberland suitability changes in this reporting period was 720 aces. These total changed acres are less than 0.1% of the total suitable acres. The previous reporting cycle proposed a 0.1% change in suitability. The 10% threshold has not been reached.

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

Unsuitable timberland was not selected for timber production during the development of the 1987 Forest Plan due to (1) the multiple-use objectives for the alternative preclude timber production, (2) other management objectives for the alternative limit timber production activities to the point where management requirements set forth in 36 CFR 219.27 cannot be met and (3) the lands are not cost-efficient over the planning horizon in meeting forest objectives that include timber production. Land not appropriate for timber production shall be designated as unsuitable in the Forest Plan.

Table 20. Recommended Suitability Changes, 2012-2014

Recommended Change	Acres	Project Name
From unsuitable to suitable	119	Bussel
From unsuitable to suitable	601	Kreist Creek
Total of changes	**720**	

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

The 1987 Forest Plan stated that openings created by even-aged silviculture were generally to be limited to 40 acres, and that "creation of larger openings must conform to current Regional guidelines regarding public notification, environmental analysis and approval." The 1987 Plan set a monitoring threshold to initiate further action when 10 percent or more of the openings exceeded 40 acres in size over the reporting period.

The following table presents both the percent of openings, as well as the acres of openings, that were planned that will be created through the use of even-aged silviculture (clearcut, seedtree, or shelterwood harvests). All of the openings that exceeded 40 acres did conform to the current guidelines regarding public notification, environmental analysis and approval, and were approved by the Regional Forester. As indicated in the following table, for fiscal years 2012-2014, four NEPA decision documents approved regeneration openings that will exceed the 40 acre size. These openings amount to 3,675 acres and have an additional 1,881 acres of adjacent openings that were created during previous harvests. The following discussion focuses on the primary reasons why the 40 acre size limit was exceeded.

Since the 1987 Forest Plan was approved, there has been an increase in the understanding and awareness of how the landscape pattern of a forest (e.g., arrangement, size and juxtaposition of different structure/age classes of timber stands) can influence such things as wildlife habitat and dispersal (e.g., fragmentation of habitat, travel corridors/linkages areas), plant habitat and dispersal, disturbance size and spread (e.g., wildfires, insects and pathogens), and esthetic or scenery values. A better understanding of how forest pattern affects these resources and disturbance agents has led to a gradual shift away from creating small, relatively uniform (mostly clearcut) openings across the landscape through even-aged silviculture, to more strategically planning the location, size and type of openings so that they will not tend to fragment the landscape, and may have a greater beneficial impact in affecting potential wildfire behavior or potential insect/disease agents. In addition, since the 1987 Forest Plan was adopted, there has been more awareness of how the arrangement of harvest openings on the landscape can negatively affect aquatic resources (e.g., through sediment inputs, stream crossings, and riparian vegetation) because of the road system that might be necessary to access rather small, scattered harvest openings versus fewer, larger openings. More discussion of historic and present forest patterns on the IPNF can be found in the following documents that were prepared in anticipation of revising the 1987 Forest Plan: Analysis of the Management Situation for Revision of the Kootenai and Idaho Panhandle Forest Plans (AMS, 2003), the Comprehensive Evaluation Report (CER) and the various Geographical Assessments that were conducted for the IPNF.

For all of the reasons that were summarized above, a greater percentage of the openings that are being proposed on the Forest are larger than 40 acres in size. However, the type of even-aged silvicultural system being used has changed since the 1987 Forest Plan was adopted. In the 1987 Forest Plan, it was anticipated that almost all of the timber harvesting that would be done would use even-aged silviculture – 97 percent. In addition, the plan anticipated that approximately 90 percent of the even-aged harvesting would be conducted using the clear cut method. However, that has shifted dramatically. The vast majority of treatments approved in fiscal years 2012 to 2014 were seed tree or shelterwood type treatments, with a small fraction being clearcuts. According to the Forest Service Activity Tracking System (FACTS), the IPNF completed 7,398 acres of regeneration harvesting between fiscal years 2012 to 2014. Of the 7,398 acres, only 25 acres were complete clearcuts, which is less than 0.3%. This is well within the intended guidance of the Forest Plan to limit the amount of openings that exceed 40 acres.

Table 21. Total acres of even-aged regeneration harvest that exceed 40-acre opening size, categorized by decision documents signed during fiscal years 2012-2014

Project	Acres of Harvest	Adjacent Previous Harvest Acres
Beaver Creek	1,029	1,480
Kreist Creek	1,098	401
Lower Priest	977	356
Red Beauty	571	0
Total	**3,675**	**2,237**

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

The purpose of this monitoring item is to determine insect and disease impacts. Aerial surveys, ground surveys, timber stand inventories, and actual insect trapping are all utilized to determine the extent of current pest problems and to predict future insect and disease impacts. The threshold is when insect and disease conditions are predicted to reach epidemic or serious levels on five percent of the Forest.

The following discussion includes a short summary of information for 2012-2014. This is followed by a discussion of the broad changes that have been noticed since the Forest Plan was adopted in 1987.

Forest Diseases: Root diseases and the white pine blister rust are the dominant diseases affecting the Idaho Panhandle National Forests. Although the acreages associated with these diseases do not change dramatically from year to year, over a period of time, the cumulative impact on the Forest from such things as tree mortality, loss of productivity and effects on forest composition are substantial. About two million acres of north Idaho are infected with some level of root disease and blister rust is found throughout the range of white pine.

Forest Insects: While areas with root diseases or blister rust do not change dramatically from year to year, that is not the case with insect activity, which can change rapidly. Most of the acres infested with insects on the IPNFs in 2014 were identified during the annual aerial survey. The aerial detection map for the Forest indicates that there is a significant amount of mortality occurring in lodgepole pine from mountain pine beetles (MPB). Much of this MPB caused mortality is located in the south zone of the forest (St. Joe Ranger District). Although mortality was detected across the IPNFs, the scope of this epidemic is much larger than just the IPNFs. This insect is affecting forests across most of the Northern Rockies as well as other regions in the western states.

According to the aerial detection map for 2014, the other two agents having the largest impact on the IPNFs are fir engraver and western spruce budworm. Concentrations of these insects were most notable on the central zone (Coeur d'Alene River Ranger District) and the north zone (Bonner's Ferry and Priest River Ranger Districts). While the spruce budworm will probably not kill many trees, successive years of defoliation can certainly weaken the trees and predispose them to being killed by other mortality agents (e.g., root diseases or bark beetles). The level of spruce budworm defoliation has been at high levels for roughly seven years.

Other forest insects such as the balsam woolly adelgid, the Douglas-fir bark beetle and the fir engraver beetle, are killing trees in some areas of the Forest. However, the aerial detection map indicates that these insects are not affecting nearly as many acres on the Forest as are the MPB and spruce budworm.

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

Forest health continues to be a major issue on the Forest and impacts may be escalating do to major shifts in species composition, structure and climatic temperatures regimes. Tree mortality from insect and diseases has been relatively high and as a result, forest fuels have increased and the risk of fires has risen.

Douglas-fir beetle populations are no longer at epidemic levels as they were in the late 1990s and first few years of 2000. Rather, the population of mountain pine beetle is now at epidemic levels and is killing a lot of acres of lodgepole pine (and a smaller extent, ponderosa pine, white pine and whitebark pine). While white pine blister rust continues to cause mortality in white pine, the impact that this disease is having on whitebark pine trees is even a greater concern. Blister rust, combined with mountain pine beetle attacks

and the impacts of fire exclusion, have cumulatively caused the loss of a large percentage of the whitebark pine on the Forest.

Treatments (either through harvesting or through the use of prescribed or wildfire) that are needed to reduce insect and disease hazards (by changing to less susceptible species or age classes) have been greatly reduced (specifically regeneration of tree species less susceptible to insect and disease) during the last decade or so due to reduced budgets and public concerns over how treatments may affect other resources.

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

First of all, in 1987 we did not fully appreciate the scope and scale of the role insects and diseases may play in driving forest conditions. This likely led to setting unrealistically low thresholds.

Second, the major change in forest composition and structure that has occurred in the past century has been documented and better quantified. As a result of changes in forest tree species composition, or changes to large homogeneous areas of older age classes (lodgepole pine) some areas of the forest now have insect and disease conditions that exceed the epidemic or 5% threshold. The amount of Idaho Panhandle National Forests forest area that is susceptible to insects increased significantly during recent decades. Due to the forest composition shifting towards tree species that are more susceptible to insect/diseases and droughts and fires, much more of the area is now at higher risks from these disturbance agents as well as potential climate change. Interior Columbia Basin Ecosystem Management Project modeling and Forest Health Assessments have shown that insect and disease drive succession in the absence of fire or management, and the result is further departure from more resilient historic forest conditions.

Recommendations:

- Recognize in the revised Forest Plan the important role of insects and diseases in forest ecosystem dynamics, and how critical forest tree species composition and structure are in influencing insect and pathogen levels.

- Treat forest composition, structure and pattern as a focus in the up-coming Forest Plan revision, and develop desired conditions for these elements that could lessen the potential detrimental impacts that these insects and diseases are having on the Forest.

- In the Forest Plan revision, emphasize the need to increase the use of unplanned ignitions (wildfires) to achieve desired forest conditions to lessen the insect and disease risk. Use openings created by wildfires as areas where blister rust resistant white pine and whitebark pine can be planted.

- Use Geographic Assessment (basin scale) information to identify locations where treatment is needed to reduce insect and disease susceptibility and improve forest conditions while also improving watershed conditions and wildlife habitat along with decreasing wildfire risk.

- Develop new monitoring approaches for insects and diseases that involve monitoring treated and non-treated lands for change in hazard and risk.

- Use multi-resource inventory, supplemented as needed, to monitor changes in root disease and bark beetle hazard and risk and evaluate the performance of blister rust resistant western white pine.

- Look for opportunities to do restoration treatment in whitebark pine in order to reverse its precipitous decline (which results from the combination of blister rust, mountain pine beetle, and fire suppression).

Forest Plan Monitoring Item B-5: Road Construction

The Forest Plan projected that 176 miles of new roads would be constructed each year and 97 miles would be reconstructed. The following table summarizes the number of miles of road construction and reconstruction that actually occurred from 1988 through 2014.

Table 22. Miles of Road Construction and Reconstruction, 1988 - 2014

Fiscal Year	Miles of Construction	Miles of Reconstruction	Fiscal Year	Miles of Construction	Miles of Reconstruction
1988	103	233	2002	1	24
1989	134	130	2003	4	64
1990	83	140	2004	7	172
1991	46	107	2005	0	838
1992	65	109	2006	6	232
1993	57	233	2007	5	53
1994	2	43	2008	0	76
1995	12	54	2009	2	111
1996	1	41	2010	1	27
1997	16	202	2011	0	2
1998	12	276	2012	2	39
1999	5	74	2013	11	144
2000	2	373	2014	3	70
2001	3	<1	**Total**	**583**	**3,868**

This table shows that the projected amount of annual new road construction (176 miles) was much greater than the amount that actually occurred for every year from 1988 to 2014. For road reconstruction the amount projected (97 miles) was exceeded for 14 of the 27 years. Road reconstruction generally occurs on older roads and is necessary to bring them up to standards so they are drivable.

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

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

Background

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

The 1987 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 2012, 2013, and 2014: For these fiscal years the Idaho Panhandle National Forests offered 130.6 million board feet of timber for sale. We sold 129.1 million board feet.

Fiscal Years 1991-2014: The following table depicts timber volumes offered and sold and sale acreages for the past 24 years.

Table 23. 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
2007	63.1	34.4	3,054
2008	55	49.6	5,048
2009	51.5	51.5	3,814
2010	52.3	33.4	2,446

Fiscal Year	Volume Offered	Volume Sold	Total Acres Sold
2011	24.0	24.0	1,048
2012	46.0	45.2	3,693
2013	39.6	40.2	2,453
2014	45.0	43.7	2,062

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 2014 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 IPNFs was addressed during the forest plan revision process for the 2015 Idaho Panhandle National Forest's Forest Plan.

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 years 1991 to 2014.

Table 24. Total Number of Violations Issued

Fiscal Year	Number of Violations	Fiscal Year	Number of Violations
1991	144	2003	445
1992	167	2004	411
1993	204	2005	337
1994	185	2006	298
1995	88	2007	224
1996	133	2008	272
1997	240	2009	301
1998	246	2010	241
1999	394	2011	222
2000	164	2012	240
2001	285	2013	171
2002	191	2014	167

Evaluation

The column Number of Violations noted in the table above is a summary for the fiscal year noted and represent a subset of the total number of violation notices issued for that fiscal year. Beginning in 2008 the number shown is represented by 26 Offense Codes[1] as listed in the LEIMARS (Law Enforcement & Investigation Management and Reporting System) database. These 26 codes represent violations associated with off-road vehicle use and other travel management violations that help assess whether forest travel plan direction is being followed.

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.

[1] Codes include: 261.9(a), 261.10(a), 261.12(c), 261.12(d), 261.14, 261.15(h), 261.15(i), 261.53(a), 261.53(b), 261.53(c), 261.53(d), 261.53(e), 261.54(a), 261.54(b), 261.54(c), 261.54(d), 261.54(e), 261.54(f), 261.55(a), 261.55(b), 261.55(c), 261.55(d), 261.55(e), 261.56, 261.58(g), 261.58(h).

Forest Plan Monitoring Item E-1: Heritage Resources

Fiscal Year 2012

Forty-four projects were accomplished in fiscal year 2012. The majority of projects fell under National Historic Preservation Act (NHPA) Section 106 compliance, which included 31 "No Inventory Undertakings", nine "No Properties Effected Undertakings", six "No Effect Undertakings" and one "Adverse Effect Undertakings". The one Adverse Effect Undertakings was the removal and construction of a Recreation Residence cabin. A Memorandum of Agreement (MOA) was signed with Idaho State Historical Preservation Office and mitigation conducted. Due to staff turnover only one NHPA Section 110 project was worked on, Spyglass Lookout Ground House Restoration on the Coeur d'Alene River Ranger District.

Fiscal Year 2013

In fiscal year 2013, the IPNF Heritage Team completed over 55 projects. The majority of projects fell under NHPA Section 106 compliance, which included 32 "No Inventory Undertakings", 13 "No Properties Effected Undertakings", four "No Adverse Effect Undertakings" and four "Adverse Effect Undertakings". Work continued on NHPA Section 110 project Spyglass Lookout Ground House Restoration. The four undertakings resulting in adverse effect determinations required Memorandums of Agreement (MOA) to be written. Three of the four undertakings were recreation residences. The fourth was the Marble Creek Splash Dam project on the St. Joe Ranger District. This proposed project is to open the water way on Marble Creek to allow for fish migration. Mitigation was conducted for all four projects as required by their corresponding MOAs.

Two unauthorized undertakings occurred on the IPNF in fiscal year 2013. The IPNF took both occurrences seriously, put an immediate stop to them once they were discovered and followed appropriate procedures. One was a recreation residence permit holder replacing a deck. The other was a mining company re-opening a historic mine tunnel/adit. An inspection by IPNF employees (including Law Enforcement) determined there were multiple non-compliance issues, possible environmental and cultural resource violations. The immediate concern occurred when the tunnel that was opened was identified as containing poisonous gas. The IPNF immediately contacted SHPO for an emergency mine closure, posted warning signs and temporarily blocked the entrance. The Forest Service abandon mines closure crew closed the opening with a bat gate. The mining company paid for damages and bat gate in 2014.

Fiscal Year 2014

The Idaho Panhandle National Forests (IPNF) Heritage Team completed 49 projects in fiscal year 2014. The majority of projects fell under NHPA Section 106 compliance, which included 34 "No Inventory Undertakings", two "No Properties Effected Undertakings", six "No Effect Undertakings", one "No Adverse Effect Undertakings", two "Adverse Effect Undertakings" and three NHPA Section 110. Adverse Effect undertakings included the Clarkia Work Center conveyance on the St. Joe Ranger District and Black Mountain Relocation on the Bonners Ferry Ranger District. MOAs and mitigation for both projects will occur in the coming years. NHPA Section 110 projects included ongoing work on Spyglass Lookout Ground House Restoration, structure stabilization on two cabins at Avery Ranger Station and maintenance work on the Luby Bay Guard Station. Two Recreation Residence Permit holders conducted unauthorized minor undertakings which were addressed.

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

This monitoring item has a five year reporting period. In 1987, the Forest Plan for the Idaho Panhandle National Forests (IPNF) identified management indicator species (MIS) to help assess the impact of land management decisions on the wildlife resource. The indicator species are: Canada lynx, gray wolf, grizzly bear, woodland caribou, bald eagle, peregrine falcon, northern goshawk, pileated woodpecker, moose, elk, and white-tailed deer. The last five year reporting date was 2008.

Population Data Estimates

Estimating population numbers and trends can be extremely difficult. Most of the available observation and population estimation data is derived from cooperative surveys and information sharing among numerous agencies, including the Idaho Department of Fish and Game (IDFG), Washington Department of Fish and Wildlife, Montana Department of Fish, Wildlife, and Parks, U.S. Fish and Wildlife Service (USFWS), and Forest Service and University researchers. Examples of the types and methods of data collection includes ground and aerial surveys, radio-collared animals, mortality and harvest reports, transplant activities, incidental sightings, and law enforcement activities. More recent innovations in DNA analysis have produced new techniques that may be used for documenting presence of a particular species, or estimating population abundance and distribution using repeated sampling. Non-invasive DNA hair-snares are an example of this type of technique. Habitat information may be used where population data are lacking.

The following provides a synopsis of the current knowledge on population status and monitoring techniques used for Management Indicator Species. Table 27 provides a summary of available observation data, population data and trends since the 1998.

Threatened and Endangered Species

Canada Lynx

The Canada lynx was listed as Threatened on March 21, 2000. The conservation of lynx populations is the greatest concern in the western mountains of the United States because of the peninsular and disjunct distribution of suitable habitat at the southern periphery of the species' range. Identified risk factors that can impact lynx populations mainly address alteration of forest habitats. Upon listing, lynx habitat management on Federal lands was guided by the Canada Lynx Conservation Assessment and Strategy (LCAS) (Ruediger et al. 2000). The LCAS directed agencies to delineate Lynx Analysis Units (LAUs) to evaluate and analyze effects of planned and on-going projects on lynx and their habitat, and addressed these risk factors. In order to assure a consistent and effective approach to Canada lynx conservation on Federal lands within the United States, the LCAS provided guidelines for management within identified lynx habitat. In 2007, based on the recommendations of the LCAS, the Forest Service adopted the Northern Rockies Lynx Management Direction (NRLMD) (USDA Forest Service 2007b), which provides lynx management standards and guidelines, and incorporates more recent research findings.

The IPNF has delineated 35 LAUs that range in size from approximately 15,868 acres to 41,230 acres. Potential lynx habitat within LAUs is approximately 582,981 acres of NFS lands on the North and South Zones of the IPNF.

There is yet no recovery plan for the Canada lynx. The Service's recovery outline for lynx (USFWS 2005, entire) serves as an interim strategy to guide recovery efforts until a draft recovery plan has been completed. The FWS first designated critical habitat for the species in 2006 and revised the designation in 2009. On September 12, 2014 the FWS revised the designation of critical habitat and revised the Distinct

Population Segment boundary. This latest revised designation includes most of the areas designated in 2009, as well as additional timber lands in northern Maine and Bureau of Land Management and National Park Service lands in NW Wyoming. The final critical habitat designation totals within the IPNF amounts to approximately 34,688 acres, within the far NE portion of Idaho, within the American-Canuck and Deer-Skin Lynx Analysis Units (LAUs). These LAUs are in the Purcell Mountains, in the northeastern most portion of the state.

Population Status and Monitoring: Population information for this species is difficult to obtain. DNA hair snare sampling and track surveys have been used since the 1990s.

From 2010-2014, the IPNF participated in the IDFG led Multi-Species Baseline (MBI) effort which included summer and winter surveys to determine forest carnivore presence and distribution throughout the Forest (Lucid et al. 2016). During this time period, a total of 498 winter forest carnivore bait stations were deployed, the majority of which were on lands administered by the IPNF. Canada lynx were detected at two locations in the Selkirk and Purcell Mountains (ibid).

Other detections included a female lynx that was accidently snared by bobcat trappers south of Bonners Ferry in 2013. She was subsequently radio-collared by IDFG personnel. The following year a Canada lynx was photographed in a grizzly bear DNA hair-snare corral site in the Purcell Mountains.

Required Monitoring within the NRLMD: The NRLMD contains four vegetation management standards: 1) if more than 30 percent of the lynx habitat in a LAU is currently in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat (SISS), no additional habitat may be regenerated by vegetation management projects (Standard VEG S1), 2) timber management projects shall not regenerate more than 15 percent of lynx habitat on NFS lands within a LAU in a ten year period (Standard VEG S2), 3) vegetation management that reduces snowshoe hare habitat in these stands is prohibited (Standard VEG S6) with some exceptions (including fuels treatment projects within the wildland/urban interface), and 4) the NRLMD does not allow pre-commercial thinning in lynx habitat (Standard VEG S5), although it also makes an exception for pre-commercial thinning within the wildland urban interface (WUI) as long as the combined acres excepted from Standards VEG S1, VEG S2, VEG S5 and VEG S6 do not exceed six percent of lynx habitat on each National Forest.

Required annual monitoring identified within the NRLMD includes the following when project decisions are signed:

1. Fuel Treatments:

a. Acres of fuel treatment in lynx habitat by forest and LAU, and whether the treatment is within or outside the WUI as defined by HFRA.

b. Whether or not the fuel treatment met the vegetation standards or guidelines. If standard(s) are not met, report which standard(s) are not met, why they were not met, and how many acres were affected.

c. Whether or not two adjacent LAUs exceed standard VEG S1 (30% in a stand initiation structural stage that is too short to provide winter snowshoe hare habitat), and what event(s) or action(s) caused the standard to be exceeded.

2. Application of exception in Standard VEG S5

a. For areas where any of the exemptions 1 through 6 listed in Standard VEG S5 were applied: Report the type of activity, the number of acres, and the location (by unit, and LAU) and whether or not Standard VEG S1 was within the allowance.

3. Application of exceptions in Standard VEG S6

a. For areas where any of the exemptions 1 through 3 listed in Standard VEG S6 were applied: Report the type of activity, the number of acres, and the location (by unit, and LAU) and whether or not Standard VEG S1 was within the allowance.

4. Application of guidelines

a. Document the rationale for deviations to guidelines. Summarize what guideline(s) were not followed and why.

Table 25 on the following page summarizes the annual monitoring of Canada lynx from 2010-2014.

Grizzly Bear

See the grizzly bear population status discussion on page 41 for details on population estimates and trends for the Selkirk and Cabinet-Yaak ecosystems.

Woodland Caribou

See the caribou population status discussion on page 54 for details on caribou population surveys and trends for the Selkirk Mountain population.

Previously Listed Threatened Species

Bald Eagle

This species was originally listed as a threatened species under the Endangered Species Act but was removed once recovery goals were met in 2008. The post-delisting Monitoring Plan (Plan) (USDI Fish and Wildlife Service 2009) is used to monitor the status of the bald eagles by collecting data on occupied nests over a 20-year period with sampling events held once every 5 years starting in early 2009. The Plan recommends that the State agencies continue the occupied nest survey data collection and submission to the USFWS.

The bald eagle is classified as a “Protected Nongame Species” by the state of Idaho (IDFG Species Catalog 2016) and has a State Rank of S5 “demonstrably widespread, abundant, and secure”. NatureServe Status is a Global Rank of 5 (G5) “demonstrably secure” (NatureServe 2015a).

Current population data on the IPNF is derived from monitoring of known nesting territories and annual mid-winter census of total numbers of bald eagles observed from year-to-year at particular wintering sites (IDFG 2009a; IPNF monitoring records 2009-2014). Since 2008, the IPNF has continued to monitor a total of 17 – 27 bald eagle nesting territories in the vicinity of Lake Pend Oreille, Hoodoo Lake, Priest Lake and Robinson Lake, all of which have adjacent Forest Service ownership (NRIS database). Table 27 on page 34 summarizes the IPNF monitoring results.

Table 25. Summary of fuels treatments and pre-commercial thinning in Canada Lynx habitat on the Idaho Panhandle National Forests, 2010-2014

Project name	Decision date	LAUs affected	Type of exception	Acres of lynx habitat treated	Fuels			Standards excepted	Pre-commercial Thinning	
					Acres of lynx habitat treated in WUI	Acres of lynx habitat treated outside WUI	Acres treated in WUI where exceptions apply		Acres pre-commercially thinned in lynx habitat	Type of activity (ROD, Att. 1, pg.3)
Clark Creek Blowdown (NZ)	7/7/2011	Cascade	NA	20	NA	NA	NA	NA	NA	NA
NZ Juvenile Tree Thinning (NZ)	12/2/2011	Kalispell, Pelke, Lunch	Pre-commercial thinning	936	NA	NA	NA	S5	524	Daylight thinning of white pine
East Fork Meadow (NZ	12/5/2011	Round Prairie	Fuels in WUI	38	12	0	12	S6	NA	NA
20 Mile (NZ)	6/13/2014	Grouse, Katka	Pre-commercial thinning in WUI	593	276	317	276	S5	NA	NA
Total Acres of Exceptions, 2010-2014 :							**288**		**524**	

The number of known bald eagle nesting territories in Idaho increased from 234 in 2007 to 247 in 2008. The number of territories and number of young fledged continued to increase on an annual basis (IDFG 2009a). There are 10 Bald Eagle Management Zones delineated in Idaho. Zone 7 encompasses the majority of the Idaho Panhandle National Forest. In 2008, a total of 62 territories were checked, with 46 of those confirmed as occupied (IDFG 2009a). Of the 46 occupied nests in the Panhandle Zone 7, 33 were successful (IDFG 2009a).

IDFG has not produced an eagle nesting summary since 2008. IDFG suspended annual surveys after the 2009 breeding season, in line with the USFWS monitoring plan (Knetter pers. comm. 2016). IDFG did conduct surveys in 2014 (5 years post-delisting) and intends to develop a summary report for the 2009 and 2014 breeding seasons (Knetter pers. comm. 2016).

The IPNF also participates in annual Mid-Winter Bald Eagle surveys that take place during the first two weeks of January each year. The U.S. Army Corps of Engineers (USACE) coordinates the Midwinter Bald Eagle Survey. Initial objectives of the survey were to establish an index to the total wintering Bald Eagle population in the lower 48 states, to determine eagle distribution during a standardized survey period, and to identify previously unrecognized areas of important winter habitat (Steenhoff et al 2008). From 2009 to 2014 the IPNF has monitored up to 4 routes: Site 3 – Bonners Ferry to Montana Line (2 surveys), Site 4 – Round Lake to Marble Creek (3 surveys), Site 6 - Priest River to Priest Lake (6 surveys), and Site 12 – Hayden Lake (1 survey). Overall trends reported for these sites from 1986 – 2010 were reported by Steenhof et al (2008) (see Summary for Individual Routes, Mid-winter Bald Eagle Count). Increasing trends were reported for all routes with the exception of the Round Lake to Marble Creek Route on the St. Joe District. However, only the 2009 and 2010 Priest River to Priest Lake route counts were included in the summary reported by Steenhof et al (2008). Counts from both the Bonners Ferry to Montana Line and Round Lake to Marble Creek routes increased from 2012 to 2014 (IPNF monitoring records 2009 - 2014).

Gray Wolf

Management of the gray wolf has been very contentious since they were declared endangered by the U.S. Fish and Wildlife Service (USFWS) in 1974 under the Endangered Species Act. As part of the 1987 recovery plan for wolves in the Northern Rocky Mountains (NRM), wolves were reintroduced in 1995 and 1996 into central Idaho. Through reproduction and natural dispersal (including animals moving south of Canada), the wolf population grew steadily and reached a population criteria established in the 1987 Northern Rocky Mountain Wolf Recovery Plan (USDI Fish and Wildlife Service 1987). By 2000, the USFWS had begun a status review to determine if delisting wolves was warranted. The NRM Wolf recovery goals were first met in 2002.

At that time, the Idaho legislature adopted the Idaho Wolf Conservation and Management plan that places management responsibility with Idaho Fish and Game (IDFG) following delisting (Idaho Legislative Wolf Oversight Committee 2002). Idaho's and Montana's post-delisting management plans were approved by USFWS in 2004.

During 2003 to 2009 the USFWS reclassified and twice delisted all or part of the NRM gray wolf population. These rules were overturned by various U.S. District Courts.

In 2011, Congress reinstituted the 2009 rule delisting the NRM wolves except in Wyoming. Gray wolves were subsequently delisted in Wyoming in September 2012. This action returned management of all NRM wolves to the States.

In September of 2014, the Federal District Court for the District of Columbia vacated the delisting of wolves in Wyoming under the ESA. Hence, wolves are again listed as a nonessential experimental population for all of Wyoming (U.S. District Court for the District of Columbia, 2014).

The IPNF Administrative Unit includes federal lands within Washington, Montana, and Idaho, with the vast majority within Idaho. States within the wolf recovery area (ID, MT, and WY) are required by post-delisting rules to submit an annual monitoring report to the USFWS. IDFG delineated Wolf Data Analysis Units (DAUs) that were designed to implement monitoring and management under the State Wolf Population Management Plan (IDFG 2008). IDFG produces annual wolf monitoring progress reports and cooperates with Montana Department of Fish, Wildlife, and Parks (MFWP) to include any pertinent wolf data along state boundaries. The vast majority of IPNF lands are within the Panhandle DAU and annual pack numbers from 2008 - 2014 are summarized within Table 27. Although it is clear that wolves are utilizing IPNF lands within the Dworshak-Elk City DAU, those results are not easily quantified since the majority of use within that unit falls outside the IPNF administrative boundary. Therefore, only the Panhandle DAU annual monitoring results are summarized in Table 27.

Although this 5-year monitoring item spans 2009 – 2013, 2014 data was available and included to coincide with the final year under 1987 Forest Plan for the Idaho Panhandle National Forests. As of 2014, the status of the wolf population in the NRM has consistently exceeded recovery goals since 2002 (as demonstrated by pack distribution and the number of wolves, packs, and breeding pairs in 2014) (Jimenez 2015). Documented dispersal of radio collared wolves and effective dispersal of wolves between recovery areas determined through genetic research further substantiate that the metapopulation structure of the NRM has been maintained solely by natural dispersal (Jimenez 2015). No threats to the NRM wolf population were identified in 2014. (ibid). The Idaho numbers in 2014 were estimated at 770 wolves found in 104 packs with 26 breeding pairs (IDFG 2015). The Panhandle DAU was occupied by 20 documented packs (including four Idaho border packs), and one other documented group at the conclusion of 2014 (IDFG 2015). Three suspected packs were attributed to this zone. Nine border packs reported for Washington and Montana were confirmed to spend time on the Panhandle DAU (IDFG 2015).

Peregrine Falcon

This species was originally listed as a threatened species under the Endangered Species Act but was removed once recovery goals were met in 1999 (64 FR 46542). The peregrine falcon was originally classified as “threatened” in the state of Idaho, but IDFG subsequently proposed to reclassify the peregrine falcon from “state threatened” to “protected nongame” in 2009. This reclassification become official in 2010 (Moulton 2012).

As part of the delisting process, the USFWS recommended the continuation of population monitoring through 2015 (U.S. Fish and Wildlife Service 2003). This effort is designed to detect declines in territory occupancy, nest success, and productivity in six regions across the U.S. Under the plan, data will be collected from a randomly-selected subset of peregrine territories for five sampling periods, at three-year intervals, with full implementation beginning in 2003 and ending in 2015. Table 27 on page 34 is a reflection of state and Forest surveys completed from 2009 – 2014 (Moulton 2009 and 2012; IPNF survey records 2009-2014).

The IPNF has two known peregrine nesting sites located on the North Zone. The first nesting territory was discovered in 1997 and was monitored from 1997-2002 (Moulton 2012). The second nesting territory was discovered in 2007 and has been monitored for occupancy and success since that time (IPNF monitoring records 2009-2014).

A total of 46 known and historical territories were monitored statewide in 2013 (Moulton 2012). Statewide, the known number of peregrine falcon occupied territories in 2012 saw no change (26 pairs) since the last survey in 2009. The number of successful territories increased by one with 20 successful territories in 2012 compared to 19 in 2009. Fledging success increased from 73 in 2009 to 77 percent in 2012. Peregrine pair numbers remained relatively stable in 2012 and demographic parameters remained within the average range of previous inventory efforts. In summary, surveys over the past 21 years have shown a steadily increasing peregrine population and IDFG expects this trend to continue (Moulton 2012). Table 27 provides a summary of occupied nest territories since 1998.

Forest Plan Management Indicator Species

Northern Goshawk

USFWS conducted a Northern Goshawk Status Review (USDI Fish and Wildlife Service 1998) to assemble information pertinent to the question of whether listing under the Endangered Species Act was warranted for the northern goshawk. All of Idaho was included within the status review area. The Status Review Team concluded that population trends could not be determined due to the paucity of historic quantitative data and because of biases inherent in the various methodologies used to track bird populations. More specifically, long-term, well-distributed and well-designed demographic studies and consistently collected forest habitat data were lacking. These types of information were essential to facilitate an initial assessment of population and habitat trends through time (USDI Fish and Wildlife Service 1998).

According to NatureServe the northern goshawk has a conservation status rank of G5. This indicates the species is globally secure – common, widespread and abundant (NatureServe 2015b). Although the vast majority of the IPNF is within Idaho, it also includes some portions of Washington and Montana. Idaho and Montana list the status of the northern goshawk as S3, which indicates there are some factors posing moderate risks to the species or its habitat. (IDFG, Idaho Species Catalog 2016; Northern Goshawk, Montana Field Guide 2016).

The northern goshawk is a Species of Concern in the states of Montana and Washington. In Montana, Species of Concern are native taxa that are at-risk due to declining population trends, threats to their habitats, restricted distribution, and/or other factors (Northern Goshawk, Montana Field Guide 2016). In Washington, Species of Concern are given a Status Category. The northern goshawk is a State Candidate species (SC) which means there is sufficient evidence that its status may meet the listing criteria defined for State Endangered, Threatened, or Sensitive (WDFW 2016).

Until 2007, the northern goshawk was listed as a Sensitive Species in the Northern Region of the Forest Service. Forest Service Manual states that Sensitive Species are those for which there is a significant current or predicted downward trend in population numbers/density and a similar downward trend in habitat capability that would reduce distribution of the species. Regional data collection and analyses demonstrated that neither condition existed for the northern goshawk (Kowalski 2006); therefore in 2007, the species no longer met the definition for “sensitive” and was removed from the list (USDA Forest Service 2007a).

In 2011, the IPNF produced a document entitled “Management Indicator Species Considerations for the Idaho Panhandle National Forests” (MIS White Paper) (USDA Forest Service 2011a). This document compiled an extensive review of pertinent northern goshawk literature and concluded that the IPNF contains substantially more than enough habitat distributed throughout the Forest to support a minimum viable population of northern goshawk. In addition, the best available science suggested that the goshawk

population is, at a minimum, stable if not increasing slowly, and there has been no scientific evidence that the goshawk population is in decline (ibid).

IPNF northern goshawk territory monitoring data and incidental observation data was compiled from 2001 through 2010 and documented a minimum of 41 different territories active in that time period (USDA Forest Service 2011a). During any given year, the number of active territories documented represents the minimum number since each territory is not surveyed annually. Goshawk territory monitoring has continued since 2010 and is summarized in Table 27 on page 34 (IPNF monitoring records 2009-2014).

Moose

Moose populations have greatly expanded their range and numbers in Idaho over the past few decades, moving westward into Washington and northeastern Oregon and southward into Utah (IDFG 2013a).

The Panhandle Region is made up of several game management units (GMUs) delineated by the Idaho Department of Fish and Game (GMUs 1, 2, 3, 4, 4A, 5, 6, 7, and 9). The vast majority of IPNF administered lands are within the Panhandle Region. Only the northern most portions of GMUs 8A and 10A have lands administered by the IPNF. Although data on moose population size are difficult to obtain, it appears that moose populations in central Idaho Wilderness areas are declining as wolf populations expand (IDFG 2013a). IDFG has invested in focused research to monitor moose mortality rates and causes of death in GMU 10 (2008-2012). Preliminary results indicate that wolves have not proven to be a significant cause of mortality on radio-collared adult moose. However, if early trends in wolf-caused calf mortality continue, calf survival and recruitment could be a serious issue (ibid).

Open areas and extensive riparian areas that typify moose habitat elsewhere are not widespread in the Panhandle Region. Moose in this region often utilize closed-canopy timber stands with interspersed shrub fields and creek bottoms. Presently, moose populations appear to be stable in most areas of the Panhandle. However, the Panhandle Region offered 15 less tags from 2011 because of possible declining populations or hunt quality in some controlled hunt areas (ibid).

Documented non-hunt mortalities have, at times, been a serious concern in the Panhandle Region. Illegal moose kill have decreased due to enforcement and educational efforts but harsh winter conditions and deep snow periodically lead to high levels of road/train kills in the Panhandle Region (IDFG 2009). During February and March of 2009 it was reported that at least 40 moose were killed as a result of train collisions between Sandpoint and the Canadian border (IDFG 2009).

The lack of moose population surveys is a serious handicap to moose management in Idaho (IDFG 2013a). One of the Panhandle Region's Management Direction goals that has carried over from one year to the next has been to "develop an index to moose population trends that does not rely solely on aerial surveys" (IDFG 2013a).

In December of 2010, an aerial helicopter survey in the northern part of GMU 5 documented 68 moose. The moose sightability data were run through four different models (two moose and two elk models) and population estimates varied from 72 to 115 (ibid). A subsequent aerial thermal infrared survey was conducted at the end of March 2011 in the same section of GMU 5. A total of 112 moose were documented by observing their level of emitted infrared energy versus background levels. This survey technique yielded results within the range of the elk sightability model estimates (IDFG 2013a).

Pileated Woodpecker

According to NatureServe the pileated woodpecker has a global conservation status rank of G5 (NatureServe 2015b). IDFG has given the pileated woodpecker a state rank of S4 which indicates that this species is not rare and apparently secure, but with cause for long-term concern (usually more than 100 occurrences) (IDFG, Idaho Species Catalog 2016). The pileated woodpecker is not a "species of greatest conservation need" in Idaho, but is listed as a Species of Concern in Washington with a State Candidate (SC) status (WDFW 2016). In Montana, the pileated woodpecker is a Species of Concern with a S3 rank (Pileated Woodpecker, Montana Field Guide 2016).

According to the 2011 review of this species (i.e. the MIS White Paper), the IPNF contains substantially more than enough habitat distributed throughout the Forest to support a minimum viable population of pileated woodpecker (USDA Forest Service 2011a). Pileated woodpeckers and their foraging sign are also seen and documented across the Forest. In addition, the best available science indicates that the pileated woodpecker population is likely increasing in the Northern Rockies and there has been no scientific evidence that the pileated woodpecker population is in decline (ibid).

The Partners in Flight (PIF) Population Estimates Database queries for pileated woodpeckers was downloaded for reference in the MIS White Paper (USDA Forest Service 2011a). At that time, the PIF database had been last updated in 2007 and estimated there were 71,000 pileated woodpeckers in the Northern Rockies Bird Conservation Region (BCR 10). The 2007 PIF population for Idaho was estimated at approximately 9,000 pileated woodpeckers (PIF 2007). Since the completion of the MIS White Paper, PIF has updated their population estimates database to Version 2.0. The updated pileated woodpecker population is estimated at 160,000 within BCR 10 (PIF 2013). The Idaho population within BCR 10 is estimated at 17,000 (PIF 2013). Caution is recommended in comparing population estimates from the old version of the PIF database to the updated Version 2.0 since changes in the data and estimation process have occurred (PIF 2013). As with the older dataset, the North Idaho estimate has a lower data quality rating than the data for the Northern Rockies and therefore a lower accuracy due to a more limited amount of data. See Guide to the PIF Population Estimates Database: North American Landbird Conservation Plan 2004 for a detailed description of the data used and limitations of these population estimates (Blancher et al. 2007).

From 2001 to 2010, there have been 70 documented sightings, auditory detections and sign (e.g. feeding sites, excavated holes) of pileated woodpeckers on the IPNF (USDA Forest Service 2011a). In addition, anecdotal reports by field going Forest Service personnel observing pileated woodpeckers are common. Increased emphasis on documenting the presence of pileated woodpeckers, particularly in project-related areas, has created a spike in survey efforts on the IPNF.

Since the 2010 compilation of pileated woodpecker detections, there have been additional surveys related observations as well as incidental reports. From 2011 through 2014, there have been 397 call stations set up for presence/absence broadcast surveys on the IPNF (NRIS database 2016). In that same timeframe, there have been 338 documented sightings, auditory detections, and reported sign of pileated woodpeckers on the IPNF (NRIS database 2016). Table 27 on page 34 summarizes the pileated woodpecker annual monitoring effort and associated detections from these efforts (ibid).

Rocky Mountain Elk

Idaho Department of Fish and Game (IDFG) manages elk populations and harvest levels. The IPNF works with IDFG to meet habitat objectives to sustain the population objectives set by the state. IDFG divides the state into Regions, and Elk Management Zones, which are Game Management Units (GMUs)

that have been grouped into zones. The vast majority of the IPNF is in Region 1 (i.e. Panhandle Region). Elk populations are monitored by IDFG with winter aerial surveys in most Elk Management Zones every three to five years. Harvest and antler point class in the harvest are monitored as well.

IDFG issues a yearly Progress Report containing the results of elk surveys and inventories by Elk Management Zone. Also included in the report are climatic conditions, management objectives, historical perspectives, habitat, biological, inter-specific and predation issues.

The Panhandle Zone is a large and diverse zone consisting of Units 1, 2, 3, 4, 4A, 5, 6, 7, and 9. Traditionally, the majority of elk habitat, elk numbers, and elk hunting activity occurred in Units 4, 4A, 6, 7, and 9. These units are primarily composed of forested public lands and private timber company lands and consistently record some of the highest hunter densities and elk harvest densities in the state. Expanding elk herds have recently increased hunter activities in Units 1, 2, 3, and 5, particularly in the agricultural areas of Units 3 and 5 (IDFG 2013b).

Objectives for the Panhandle Zone are to establish a population of 2,900-3,900 cows and 600-800 bulls, including 350-475 adult bulls, as measured via aerial surveys of the Panhandle Zone Bellwether Area (IDGF 2013b). A herd composition survey was conducted during 2013 to assess elk recruitment in various Panhandle game management units (GMUs). Results of the survey indicated that calf numbers were below desired levels in portions of the St Joe River drainage (GMUs 6 and 7). Calf to cow ratios are also trending lower in GMU4 (ibid).

The most significant impact to elk populations in the Panhandle is severe winter weather conditions that result in abnormally deep snow or delayed spring green up. Adult and particularly calf elk survival have been compromised as a result of severe winter conditions that drain body condition, reduce the availability of food and increase the impacts of predation. The 2012-2013 winter was not extreme at any given time. Over-winter conditions in the Panhandle likely did not contribute to higher than normal elk mortality during the 2012-2013 winter (ibid).

Aerial surveys, both population estimates and herd composition surveys, are a valuable part of regional elk management, but must be considered in combination with other information sources. The homogenous, heavy-cover habitat that typifies the Panhandle Zone necessitates caution when interpreting elk sightability survey results. The most recent and available Panhandle Zone survey was conducted in January 2009 (ibid). Approximately 60 hours of helicopter time was used to survey 40 of the 108 available search units. Total elk observed (2,734) created a population estimate of 7,221 elk for this area. While the bull to cow ratio was 29 bulls per 100 cows, of particular concern was the calf to cow ratio of 15.3 calves per 100 cows. No sightability flights were attempted in 2012 (ibid).

In an effort to determine cow survival, twenty-one elk were captured and radio-collared in GMU 6 between the towns of Avery and Calder in the St Joe River drainage in 2011. The initial phase of this project began in 2011 following some preparation in 2010. The overall objective of the project was to assess adult cow elk survival in the St Joe River drainage. All radio marked animals were located monthly via fixed-winged aircraft to determine status. From March 2011 through February 2012 there were 4 mortalities of the 21 radio-marked elk producing a Pollock survival estimate of 81 percent. This adult cow elk survival rate is considerably lower than that observed during a similar study conducted in the same area from 1995 through early 1999 (ibid).

In 2014 IDFG fit 45 cow elk with GPS collars in 2014 in GMUs 3 and 4, with the majority of elk collared in GMU 4 (89 percent) (Moore pers. comm. 2016). The annual survival rate of these collared cows was 91 percent (Moore pers. comm. 2016). The 2014 annual survival rate from previously collared cows in

GMUs 6 and 7 from 2013 was 100 percent, both being higher than reported in 2012 (ibid). Aerial flights were conducted in GMUs 4, 6, and 7 to determine herd composition of elk, with particular interest in the number of calves per 100 cows. Calf: cow ratios were 25, 19, and 13 in units 4, 6, and 7, respectively (ibid). These ratios were very similar to previous surveys in 2013. (ibid).

Prescribed fire and wildland fire create early successional habitat which can increase elk habitat potential (Lyon and Jensen 1980, Collins and Urness 1983, Leege 1979, Merrill and Peek 1982, DeByle et al. 1989, Jourdonnais and Bedunah 1990, Sachro et al. 2005). Road closures or decommissioning have significant potential to benefit elk through improving elk security (Christensen et al. 1993, Rowland et al. 2005). Table 26 lists the accomplishments claimed on the IPNF from 2009-2014 as terrestrial wildlife habitat improvements that benefited elk (WFRP/WIT Accomplishment databases).

Table 26. IPNF Wildlife Accomplishments that Benefited Elk – Wildlife, Fish, and Rare Plant Management System (WFRP) & Watershed Improvement Tracking System (WIT) 2009-2014

Year	Prescribed Fire Acres	Resource Benefit/Wildland Fire Acres	Road Decommissioning Providing Habitat Security Acres	Total Acres
2009	--	--	4,000	4,000
2010	--	--	100	100
2011	2,627	1,031	15,638	19,296
2012	1,610	--	5,282	6,892
2013	2,011	1,729	--	3,740
2014	1,456	1,100	2,372	4,928

Maintenance of the quality and quantity of habitat available to elk is crucial to their long-term survival. From 2011 through 2014 the IPNF has partnered with Idaho Department of Fish and Game and Rocky Mountain Elk Foundation to accomplish over 7,700 acres of big game habitat improvements through prescribed burning (Table 26).

White-tailed Deer

White-tailed deer management is guided by the White-tailed Deer Management Plan – 2005-2014 (IDFG 2004). The state is divided into 7 whitetail data analysis units (DAUs) comprised of game management units (GMUs) based on habitat characteristics and whitetail management priority. White-tailed deer generally receive management priority over mule deer in northern Idaho, while mule deer receive priority in southern Idaho (IDFG 2013c). The IPNF administers lands within all or portions of three DAUs, with the majority falling within the Northern Forest DAU 1 (GMU 1, 2, 3, 4, 4A, and 6). Only the northern portions of the Central Forest DAU 2 (only GMU 7 and 9) and the Northern Agriculture DAU 3 (only GMU 5, 8A, 10A) have lands administered by the IPNF.

White-tailed deer in Idaho are widely dispersed and occupy a variety of habitats, most of which is comprised of thick vegetative cover making most population counting techniques ineffective. IDFG has experimented with various techniques including aerial surveys, spot-light counts, and radio telemetry, among others. To date, no single population technique provides reliable and cost-effective measures of population demographics and abundance. However, IDFG has been monitoring deer harvest (an index to population abundance and distribution) since 1975. Additionally, species-specific deer hunter participation information has been collected since 2005 and provides additional information relative to catch-per-unit-effort indices (IDFG 2013c).

Hunter densities in Northern Forest (DAU 1) are relatively high, success rates are moderate, and the opportunity to harvest a mature white-tailed deer buck is high (ibid). The harvest success rate in 2012 for hunters indicating they were hunting whitetails was 34 percent, higher than the previous three year average of 29 percent. The management criteria for hunters, hunter-days and buck harvest are well above minimum objectives (ibid).

Most of the Central Forest (DAU 2) consists of coniferous forest habitat with moderate to high road densities. In general, the northern and western portions of the DAU provide good white-tailed deer habitat, while the heavily forested and higher elevation eastern portion supports whitetails at much lower densities. Hunter densities, success rates, and the opportunity to harvest a mature white-tailed deer buck are all moderate (ibid). Loss of low-elevation, closed canopy stands important during deep-snow winters is the primary habitat concern in GMUs 7 and 9 (ibid).

White-tailed hunter numbers, hunter days afield, and harvest have been increasing over previous 3 reporting periods 2010 through 2012. Hunter harvest has increased from 694 in 2010 to 1,253 in 2012 (ibid). These data support the general consensus of the public that the white-tailed deer population in the Panhandle Region is continuing to increase (ibid).

Table 27. Summary of Management Indicator Species population data and monitoring efforts on the Idaho Panhandle (IP) National Forest, 1998-2014*

SPECIES	1998	2003	2008	2013	2010-2014 Surveys	Trend
Canada Lynx (*Threatened*)	Unknown	Unknown	Unknown	Known presence in Selkirk & Purcell Mtns. Radio collared female in Cabinets	**2010** NZ DNA hair snare surveys- 1 Male detected (Selkirks); **2011** NZ DNA hair snare surveys-0 detections **2012** NZ DNA hair snare surveys-1 detection **2013** NZ DNA hair snare surveys-0 detections **2014** NZ/CZ/SZ DNA hair snare surveys-1 detection	Present on North Zone but trend unknown
Grizzly Bear (*Threatened*)	**SRZ**-45 to 50 **CYRZ**-30 to 40[4]	**SRZ**-35 to 50 **CYRZ**-30 to 40[4]	**SRZ**-58 **CYRZ**-47[4]	**SRZ**-80 to 85 **CYRZ**-48 to 50	**2012-2014** Renewed radio collaring effort in SRZ (US/BC) & ongoing research in CYRZ to document population status. **2011-2012** DNA Hair Snare Research in CYRZ used to establish population size in 2012.	**SRZ**—67% probability increasing (2004 estimate) **CYRZ**—62% probability increasing (2014 estimate)
Woodland Caribou (*Endangered*)	45	41	46	23	IDFG/BC Ministry of Forests annual winter census. Population was radio collared in 2014. Down to **18** animals in **2014**. Wolf predation documented.	Decreasing
Bald Eagle[1]	3 territories IPNF / 34 Regionally	10 territories IPNF/ 52 Regionally	15 territories IPNF / 62 Regionally	26 territories IPNF / unknown Regionally	**2009-2014** Monitoring of 17-27 known territories in/near NZ IPNF boundary (CZ and SZ nest territories monitored by others: **2009** NZ 17 territories monitored, 6 successful, 9 young **2010** NZ 22 territories monitored, 10 successful, 12 young **2011** NZ 20 territories monitored, 15 successful, 25 young **2012** NZ 25 territories monitored, 11 successful, 11 young **2013** NZ 26 territories monitored, 10 successful, 15 young **2014** NZ 27 territories monitored, 15 successful, 24 young Plus Annual Winter Census for Individuals 2009-2014 on NZ, CZ, SZ	Increasing Increasing

SPECIES	1998	2003	2008	2013	2010-2014 Surveys	Trend
Gray Wolf[1]	No Packs	2 Packs	17 Packs 1 Suspected Pack 2 areas-wolf activity	20 Packs (includes 4 Idaho border packs) 3 Suspected Packs 2 documented groups 10 border packs reported by WA and MT	Aerial and ground surveys on the Panhandle Wolf Management Unit 2010 through 2014 conducted by IDFG and reported in Annual Wolf Monitoring Progress Reports (IPNF observations included). **2010** 8 documented resident packs, 6 documented resident border packs, 1 suspected pack and 4 other documented wolf groups. **2011** 9 documented resident packs, 5 documented resident border packs, 3 suspected packs, and 1 other documented group. **2012** 15 documented resident packs, 5 documented resident border packs, 3 suspected packs, and 1 other documented group. **2013** 20 documented packs (including 4 Idaho border packs), and 2 other documented groups. **2014** 20 documented packs (including 4 Idaho border packs), and 1 other documented group.	Stable
Peregrine Falcon[1]	1 Territory IP 17 Territories ID	1 Territory IP 24 Territories ID	1 Territory IP 23 Territories ID	1 Territory IP 26 Territories ID	**2009-2014** Surveyed 1 of 2 located on the NZ. **2009+2012** IDFG surveys	Stable to Increasing
Northern Goshawk	51 known territories	53 known territories[2]	63 known territories	88 known territories	**2009** 33 territories were surveyed on NZ, CZ and SZ; 9 were active and 5 young produced. **2010** 17 territories were surveyed on NZ and SZ; 12 were active and 7 young produced. **2011** 23 territories were surveyed on NZ and SZ; 13 were active and 14 young produced. **2012** 20 territories were surveyed on NZ; 10 were active and 11 young produced. **2013** 23 territories were surveyed on NZ; 11 were active and 13 young produced. **2014** 23 territories were surveyed on NZ; 11 were active and 12 young produced; 3 additional territories identified in 2014.	Stable

SPECIES	1998	2003	2008	2013	2010-2014 Surveys	Trend
Pileated Woodpecker	Unknown	Unknown	Unknown	Minimum of 366 survey stations monitored 2011-2013	**2009** Incidental sightings IPNF**:** 7 detections (1 pair, 6 individuals) NZ, SZ **2010** Incidental sightings IPNF: 28 detections (3 pairs, 25 individuals) NZ, SZ **2011** Monitoring presence/absence transects (137 stations): 78 detections (10 pairs, 68 individuals) NZ, CZ, SZ **2012** Monitoring presence/absence transects (107 stations): 64 detections (12 pairs, 58 individuals) NZ, CZ **2013** Monitoring presence/absence transects (122 stations): 98 detections (11 pairs, 87 individuals) NZ **2014** Monitoring presence/absence transects: 47 detections (11 pairs, 42 individuals) NZ	Stable
Moose	Unknown	Unknown	Increasing	Stable	**2010** Partial helicopter survey in GMU 5. See write up for details.	Stable in the Panhandle Region
Rocky Mountain Elk	Unknown	Unknown	Stable to Increasing	Stable to Decreasing	**2009-2014** Surveys—see write up for details	Stable to Decreasing Calf:Cow ratios in GMU 6, 7, and 9 low, and trending lower in GMU 4.
White-tailed Deer	Unknown	Unknown	Stable to Increasing	Stable to Increasing	**2009 -2014** Surveys—see write up for details	Stable to Increasing

*Data provided from a variety of sources (see citations above). North Zone=NZ; Central Zone= CZ; South Zone=SZ.

Literature Cited

Albrecht, N. and C. Heusser 2009. Detecting the Presence of Fishers and Lynx on the Ceded Territory of the Coeur d'Alene Tribe. Coeur d'Alene Tribe, Project Completion Report. 36 pp.

Allen, L. 2013. Biological assessment for threatened, endangered and proposed species on the revision of the land and resource management plan for the Idaho Panhandle National Forest. Terrestrial Wildlife. 233 pp.

Christensen, A.G., L.J. Lyon, and J.W. Unsworth. 1993. Elk management in the Northern Region: considerations in forest plan updates or revision. Gen. Tech. Report INT-303. Ogden, UT. USDA Forest Service, Intermountain Research Station. 10 pp.

Collins, W.B. and P.J. Urness. 1983. Feeding behavior and habitat selection of mule deer and elk on Northern Utah summer range. Journal of Wildlife Management, Vol. 47, No. 3, pp. 646-663).

DeByle, N.V., P.J. Urness, D.L. Blank. 1989. Forage quality in burned and unburned aspen communities. USDA Forest Service.Odgen, UT. 8pp.

Federal Register. 1999. Endangered and threatened wildlife and plants: final rule to remove the American peregrine falcon from the federal list of endangered and threatened wildlife and to remove the similarity of appearance provision for free-flying peregrines in the conterminous United States. Vol. No. 64, August 25, 1999, pp. 46542-46558.

Federal Register. 2011. Endangered and threatened wildlife and plants: reissuance of final rule to identify the northern Rocky Mountain population of gray wolf as a distinct population segment and to revised the list of endangered and threatened wildlife. Vol 76, May 5, 2011. Pages 25590-25592.

Holyan, J., K. Holder, J. Cronce, and C. Mack. 2011. Wolf conservation and management in Idaho; progress report 2010. Nez Perce Tribe Wolf Recovery Project, P.O. Box 365, Lapwai, Idaho. 90pp.

Idaho Legislative Wolf Oversight Committee. 2002. Idaho Wolf Conservation and Management Plan. 32pp.

Idaho Department of Fish and Game. 2004. White-Tailed Deer Management Plan 2005-2014. IDFG, Boise, Idaho. 63 pp.

Idaho Department of Fish and Game. 2008. Idaho wolf population management plan 2008-2012. IDFG, Boise, Idaho. 85 pp.

Idaho Department of Fish and Game. 2009a. Idaho Bald Eagle Nest Monitoring. 2008 Annual Report. IDFG, Boise, ID. 45 pp.

Idaho Department of Fish and Game. 2009b. Statewide Moose progress report, surveys and inventories. IDFG, Boise, ID

Idaho Department of Fish and Game. 2010. Inland Maritime Initiative: Maintaining Multi-Species Connectivity in a Changing Climate. Collaborative with Idaho Panhandle National Forest, U.S. Forest Service Rocky Mountain Research Station and University of Idaho. 2010 Annual Progress Report. 20 pp.

Idaho Department of Fish and Game. 2011. Inland Maritime Initiative: Forest Carnivores. Winter 2011 Update. Collaborative with Idaho Panhandle National Forest and U.S. Forest Service Rocky Mountain Research Station. 10 pp.

Idaho Department of Fish and Game. 2012. https://fishandgame.idaho.gov/content/baseline

Idaho Department of Fish and Game (IDFG). 2013a. Statewide Moose progress report, surveys and inventories. IDFG, Boise, ID

Idaho Department of Fish and Game (IDFG). 2013b. 2013 Statewide Report, Elk. Surveys and Inventories. IDFG, Boise, ID

Idaho Department of Fish and Game (IDFG). 2013c. 2013 Statewide Report, White-Tailed Deer. Surveys and Inventories. IDFG, Boise, ID

Idaho Department of Fish and Game, Idaho Species Catalog, Northern Goshawk. Retrieved on February 16, 2016, from https://idfg.idaho.gov/species/taxa/18494

Idaho Department of Fish and Game, Idaho Species Catalog, Pileated Woodpecker. Retrieved on February 16, 2016, from https://idfg.idaho.gov/species/taxa/16863

Idaho Department of Fish and Game and Nez Perce Tribe. 2012. 2011 Idaho wolf monitoring progress report. Idaho Department of Fish and Game, 600 South Walnut, Boise, Idaho; Nez Perce Tribe Wolf Recovery Project, P.O. Box 365, Lapwai, Idaho. 94 pp.

Idaho Department of Fish and Game and Nez Perce Tribe. 2013. 2012 Idaho wolf monitoring progress report. Idaho Department of Fish and Game, 600 South Walnut, Boise, Idaho; Nez Perce Tribe Wolf Recovery Project, P.O. Box 365, Lapwai, Idaho. 72 pp.

Idaho Department of Fish and Game and Nez Perce Tribe. 2014. 2013 Idaho wolf monitoring progress report. Idaho Department of Fish and Game, 600 South Walnut, Boise, Idaho; Nez Perce Tribe Wolf Recovery Project, P.O. Box 365, Lapwai, Idaho. 74 pp.

Idaho Department of Fish and Game and Nez Perce Tribe. 2015. 2014 Idaho wolf monitoring progress report. Idaho Department of Fish and Game, 600 South Walnut, Boise, Idaho; Nez Perce Tribe Wolf Recovery Project, P.O. Box 365, Lapwai, Idaho. 80 pp.

Jimenez, Mike. 2015. Service Review of the 2014 wolf population in the NRM. 4 pp.

Jourdonnais, C.S. and D.J. Bedunah. 1990. Prescribed fire and cattle grazing on elk winter range in Montana. Wildlife Society Bulletin. Vol. 18, No. 3. Pp. 232-240.

Knetter, S. 2016. Electronic message to Linda Bernhardt, Forest Service Wildlife Technician from Sonya Knetter, GIS Analyst, Conservation Sciences Program, Idaho Department of Fish and Game, regarding bald eagle nesting territory survey results since 2006. Email dated March 02, 2016.

Kowalski, S. 2006. Frequency of northern goshawk presence in R1. Unpublished report. USDA Forest Service, Region One. Missoula, MT.

Leege, T.A. 1979. Effects of repeated prescribed burns on Northern Idaho elk browse. Northwest Science, Vol. 53, No. 2. Pp. 107-113.

Lyon, L.J. and C.E. Jensen. Management implications of elk and deer use of clear-cuts in Montana.1980. Journal of Wildlife Management, Vol. 44, No. 2, pp. 352-362.

Lucid, M., L. Robinson, S. Ehlers. 2016. Multi-species Baseline Initiative Project Report, 2010-2014.

Mack, C., J. Rachael, J. Holyan, J. Husseman, M. Lucid, B. Thomas. 2010. Wolf conservation and management in Idaho; progress report 2009. Nez Perce Tribe Wolf Recovery Project, P.O. Box 365, Lapwai, Idaho; Idaho Department of Fish and Game, 600 South Walnut, Boise, Idaho. 67 pp.

Merrill, E.H. and J.M. Peek. 1982. Shrub responses after fire in an Idaho ponderosa pine community. Journal of Wildlife Management. Vol. 46, No. 2. 7pp.

Moore, B. 2016. Electronic message to Linda Bernhardt, Forest Service Wildlife Technician from Barb Moore, Regional Wildlife Biologist, Idaho Department of Fish and Game, regarding 2014 elk collaring and aerial survey results. Email dated March 02, 2016.

Moulton, C. 2009. Idaho peregrine falcon survey and nest monitoring annual 2009 report. Idaho Department of Fish and Game Conservation Sciences Program. 22 pp.

Moulton, C. 2012. Idaho peregrine falcon survey and nest monitoring 2012 report. Idaho Department of Fish and Game Wildlife Diversity Program. Boise, Idaho. 22 pp.

Nadeau, M. S., C. Mack, J. Holyan, J. Husseman, M. Lucid, D. Spicer, B. Thomas. 2009. Wolfconservation and management in Idaho; progress report 2008. Idaho Department of Fish andGame, 600 South Walnut, Boise, Idaho; Nez Perce Tribe, P.O. Box 365, Lapwai, Idaho. 106 pp.

NatureServe. 2015a. NatureServe Explorer: An online encyclopedia of life [web application]. Version 1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org. (Accessed: February 10, 2016).

NatureServe. 2015b. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org. (Accessed: February 16, 2016).

Northern Goshawk — Accipiter gentilis. Montana Field Guide. Montana Natural Heritage Program and Montana Fish, Wildlife and Parks. Retrieved on February 16, 2016, from http://FieldGuide.mt.gov/speciesDetail.aspx?elcode=ABNKC12060

Partners in Flight Science Committee 2013. Population Estimates Database, version 2013. Available at http://rmbo.org/pifpopestimates. Accessed on 2/17/2016.

Pileated Woodpecker — Dryocopus pileatus. Montana Field Guide. Montana Natural Heritage Program and Montana Fish, Wildlife and Parks. Retrieved on February 16, 2016, from http://FieldGuide.mt.gov/speciesDetail.aspx?elcode=ABNYF12020

Robinson, L., and M. Lucid 2014. Multi-species Baseline Initiative Preliminary Forest Carnivore Bait Station Results. 2 pp.

Rowland, M.M., M.J. Wisdom, B.K. Johnson, and M.A. Penninger. 2005. Effects of roads on elk: implications for management in forested ecosystems. Pages 42-52 in Wisdom, M.J., technical editor, The Starkey Project: a synthesis of long-term studies of elk and mule deer. From the 2004 Transactions of the North American Wildlife and Natural Resources Conference, Alliance Communications Group, Lawrence, Kansas.

Ruediger, B., Claar, J., Gniadek,S., Holt, B., Lewis, L., Mighton, S., and Williamson, A. (2000 August). Canada lynx conservation assessment and strategy. Forest Service Pub. R1-00-53. Missoula, MT: USDA Forest Service; USDI Fish and Wildlife Service; USDI Bureau of Land Management; and USDI National Park Service. 142 pp.

Sachro, L.L., W.L. Strong, and C.C. Gates. 2005. Prescribed burning effects on summer elk forage availability in subalpine zone, Banff Natinal Park, Canada. Journal of Environmental Management 77. Pp. 183-193.

Schwartz, M., T. Ulizio, and B. Jimenez. 2006. U.S. Rocky Mountain Fisher Survey Protocol: USFS Rocky Mountain Research Station. Missoula, MT 59801. 12 pp.

Steenhof, K., L. Bond, and L. L. Dunn. 2008. The midwinter bald eagle survey results and analysis 1986-2005. U.S. Geological Survey, National Biological Information Infrastructure, and Northwest Alliance for Computational Science and Engineering. Available on-line at http://www.nacse.org/nbii/eagles. (Feb.10, 2016, see Summary for Individual Routes, Mid-Winter Eagle Count from 1986-2010).

USDA Forest Service. 1987. Idaho Panhandle National Forests Forest Plan. Coeur d'Alene, Idaho.

USDA Forest Service. 2007a. Project Analysis in Region 1. Forest Service Region One. Missoula, MT.

USDA Forest Service. 2007b. Final Environmental Impact Statement – Northern Rockies Lynx Management Direction. Missoula, MT. 71 pp.

USDA Forest Service. 2010. FY2010 Detailed Project Information. Assessment and Research Projects: Distribution, abundance and genetic connectivity of grizzly bear, wolf, lynx, fisher and wolverine in NE Washington. Rocky Mountain Research Station. 12 pp.

USDA Forest Service. 2011a. Management Indicator Species Considerations for the Idaho Panhandle National Forests. 29 pp.

US District Court for the District of Columbia. 2014. Opinion. Case 1:12-cv-01833-ABJ Document 68. Defenders of Wildlife, et al., v. Sally Jewell, et al., and The Humane Society of the United States, et al., v. U.S. Fish and Wildlife Service, et al. 40 pp.

USDI Fish and Wildlife Service. 1987. Northern Rocky Mountain Wolf Recovery Plan. U.S. Fish and Wildlife Service, Denver, Colorado, 119pp.

USDI Fish and Wildlife Service. 1998. Status Review of the northern goshawk in the forested west. Office of Technical Support - Forest Resources, Portland, OR. Unpublished Report. 250 pp.

USDI Fish and Wildlife Service. 2000. Federal Register 65 (58) 16052-16086. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Contiguous US Distinct Population Segment of the Canada Lynx and Related Rule. March 24, 2000.

USDI Fish and Wildlife Service. 2001. Amended biological opinion addressing the effects to listed endangered and threatened species from the continued implementation of the Idaho Panhandle National Forest Land and Resource Management Plan. Upper Columbia Fish and Wildlife Office. Spokane, WA. 84 pp.

USDI Fish and Wildlife Service. 2003. Monitoring plan for the American peregrine falcon, a species removed under the Endangered Species Act. Divisions of Endangered Species and Migratory Birds & State Programs. Pacific Region, Portland, Oregon.

USDI Fish and Wildlife Service. 2009. Post-delisting Monitoring Plan for the Bald Eagle (Haliaeetus leucocephalus) in the Contiguous 48 States. U.S. Fish and Wildlife Service, Divisions of Endangered Species and Migratory Birds and State Programs, Midwest Regional Office, Twin Cities, Minnesota. 75pp.

Washington Department of Fish and Wildlife; Washington State Species of Concern Lists. Retrieved On February 16, 2016, from: http://wdfw.wa.gov/conservation/endangered/lists/search.php?searchby=simple&search=Northern+Goshawk&orderby=AnimalType%2CCommonName.

Washington Department of Fish and Wildlife; Washington State Species of Concern Lists. Retrieved On February 16, 2016, from: http://wdfw.wa.gov/conservation/endangered/lists/search.php?searchby=simple&search=Pileated+Woodpecker&orderby=AnimalType%2CCommonName.

Woodbridge. B., and C.D. Hargis. 2006. Northern Goshawk inventory and monitoring technical guide. USDA Forest Service. WO GTR-71. 63 pp.

Forest Plan Monitoring Item F-2 Grizzly Bear Recovery

The purpose of this item is to monitor grizzly bear population and habitat effectiveness to determine how the Selkirk and Cabinet-Yaak populations are doing in regards to meeting recovery objectives outlined in the Grizzly Bear Recovery Plan.

Background

The grizzly bear was listed as threatened in 1975. The bear originally occupied a variety of habitats throughout western North America, but today is confined to less than two percent of its original range. Its decline is associated with habitat loss and direct and indirect human-caused mortality. Grizzly bears are considered habitat generalists and opportunistic feeders. They commonly choose low elevation riparian areas and wet meadows during the spring and generally are found at higher elevations the rest of the year.

The Selkirk (SRZ) and Cabinet-Yaak (CYRZ) Recovery Zones are two of six grizzly bear recovery zones identified in the Grizzly Bear Recovery Plan (USDI Fish and Wildlife Service 1993). Located in northwestern Montana, northern Idaho, northeastern Washington, and British Columbia, the two ecosystems encompass approximately 4,560 square miles of habitat. Portions of the Idaho Panhandle National Forest (IPNF), Kootenai National Forest (KNF), Lolo National Forest (LNF) and Colville National Forest (CNF), and the Kootenay Lakes Forest District (British Columbia) are included in the two recovery areas. State and private lands are also included in both grizzly bear recovery zones.

Population Status

In 1993, the USFWS estimated that there 25 grizzly bears in the Selkirk recovery Zone (USDI Fish and Wildlife Service 1993). In 1999, they updated this number to approximately 46 bears in the SRZ (Federal Register 1999). Wakkinen and Kasworm (2004) estimated that the SRZ grizzly bear population has a 67 percent probability that it is increasing. Wakkinen et al. 2009 stated that grizzly bears appear to be increasing in the Selkirk recovery zone both in numbers and distribution based on an increase of sightings of bears, and changes in the distribution of credible sightings.

Other estimates for population size in the SRZ includes a 2005 DNA-based hair snare project north of B.C. Highway 3 (Proctor et al. 2007). Thirty-three individual bears were trapped during this effort (Wakkinen et al. 2009), and Proctor et al. (2007) estimated a population of 58 bears for the entire South Selkirk Grizzly Bear Population Unit. A similar DNA-based hair snare effort was implemented for a 466 square mile portion of the ecosystem south of B.C. Highway 3 in 2007 (Wakkinen et al. 2009). Preliminary results indicated that 15 different grizzly bears (nine females, six males) were detected with three of the 15 bears also detected in the earlier DNA hair sampling effort north of B.C. Highway 3 (Wakkinen 2010). Initial mark-recapture analysis indicated an abundance estimate of 17.9 bears for this 466 square mile portion of the recovery zone (ibid).

The USFWS estimated a population of 15 grizzly bears in the CYRZ in 1993 (USDI Fish and Wildlife Service 1993). Rates of increase for the period from 1983 to 1998 suggested an increasing population during that time period (Wakkinen and Kasworm 2004). Survival rates for adult and subadult females were 0.948 and 0.901 respectively, at that time. However, adult and subadult female survival rates declined to 0.926 and 0.740 respectively in 2006 (Kasworm et al. 2015a). Human-caused mortality accounted for much of this decline in survival rates and population trend. During 2014, adult female survival and subadult female survival had increased to 0.947 and 0.814, respectively, and resulted in an increasing population trend estimate since 2006. The probability that the population was stable or

increasing was calculated at 62 percent (ibid). Improving survival by reducing human-caused mortality is crucial for recovery of this population (Proctor et al. 2004).

In 2012, Kendall et al. (2015) conducted a comprehensive DNA-based hair snare research effort in Cabinet-Yaak ecosystem. They estimated a grizzly bear abundance of 48–50 bears in the ecosystem with similar estimated numbers of grizzly bears in the Cabinet (n = 22-24) and the Yaak (n = 18-22) portions of the greater recovery area.

As part of an effort to maintain the existing small population of bears in the CYRZ, four subadult female grizzly bears were captured in British Columbia and released into the Cabinet Mountains from 1990 to 1994 (USDI Fish and Wildlife Service 1990, Servheen et al. 1987). Three of the four bears remained within the area for at least one year. The success of this initial effort resulted in additional augmentations of thirteen grizzly bears (nine females and four males) from 2005-2014 from the North and South Fork of the Flathead River and the Whitefish Mountain Range (Kasworm et al. 2015a). Five bears left the target area for the augmentation and another two died from human related causes during their first year. In spite of this, the success of the augmentation program is reflected in the increase in the estimated population within the CYRZ since the early 1990s.

Augmentation has not been used in the SRZ to date.

Bear Mortality

Grizzly bear mortalities, both natural and human-caused, are important factors limiting the growth of bear populations in the SRZ and CYRZ (USDI Fish and Wildlife Service 1993). The mortality goal for both SRZ and CYRZ is zero human-caused mortality (ibid). This goal has not been reached as the number of mortalities has been exceeded during many years since research began in the SRZ and CYRZ in the early 1980s.

A total of seven grizzly bears have died due to human causes in these two ecosystems from 2012 to 2014 (Kasworm et al. 2015a and 2015b). In 2012, two and three grizzly bears mortalities were documented in Selkirks and Cabinet-Yaak ecosystems, respectively. In 2014, two human-caused grizzly bear mortalities were noted. This included one in the SRZ and one in the CYRZ (ibid).

Demographic Recovery Plan Criteria

The 1993 Grizzly Bear Recovery Plan identified three demographic criteria to evaluate the status of grizzly bear recovery (USDI Fish and Wildlife Service 1993). This included: 1) the number of unduplicated counts of female grizzly bears with cubs; 2) distribution of females with cubs by bear management unit (BMU); and 3) the number of known human-caused grizzly bear mortalities. Table 28 and Table 29 include the 2011-2014 demographic data for the SRZ and CYRZ.

Table 28. Status of the Selkirk Recovery Zone in relation to the demographic recovery targets, 2011-2014 (from Kasworm et al. 2015b)

Delisting Parameter	Delisting Target	Status			
		2011[2]	2012	2013	2014
Females w/Cubs (6-year average)	≥6.0	0	0.16	0.33	1.0
Mortality Limit (4% of minimum estimate)	1.2[1]	2.5	2.2	1.7	1.7
Female Mortality Limit (30% of total mortality)	0.4[1]	1.2	0.8	0.5	0.7
Distribution of Females with Young	7 of 10 BMUs	2 of 10 BMUs	3 of 10 BMUs	3 of 10 BMUs	6 of 10 BMUs

[1]Grizzly bear numbers are so small in this ecosystem that the mortality goal shall be zero known human-caused mortality (USDI Fish and Wildlife Service 1993).

[2]The 2011 data is included here because it was not available for inclusion in the 2010-2011 IPNF Monitoring Report.

Table 29. Status of the Cabinet-Yaak Recovery Zone in relation to the demographic recovery targets, 2011-2014 (from Kasworm et al. 2015a)

Delisting Parameter	Delisting Target	Status			
		2011[2]	2012	2013	2014
Females w/Cubs (6-year average)	≥6.0	2.5	2.83	2.5	2.5
Mortality Limit (4% of minimum estimate)	1.6[1]	1.3	1.7	1.5	1.5
Female Mortality Limit (30% of total mortality)	0.5[1]	0.3	0.5	0.3	0.3
Distribution of Females w/Young	18 of 22 BMUs	3 of 22 BMUs[1]	4 of 22 BMUs[1]	7 of 22 BMUs[1]	7 of 22 BMUs[2]

[1]Grizzly bear numbers are so small in this ecosystem that the mortality goal shall be zero known human-caused mortality (USDI Fish and Wildlife Service 1993).

[2]The 2011 data is included here because it was not available for inclusion in the 2010-2011 IPNF Monitoring Report.

Habitat Security Management for Grizzly Bears

The Grizzly Bear Recovery Plan (USDI Fish and Wildlife Service 1993) identified adequate effective habitat as the most important element in grizzly bear recovery. Effective habitat is a reflection of an area's ability to support grizzly bears based on the quality of the habitat and the type/amount of human disturbance imposed on it. Security habitat allows for sufficient space for grizzly bears to roam and effectively use available habitats. By definition, security habitat is an area or space outside or beyond the influence of high levels of human activity. Open roads, vegetation and fuel projects, and high-use recreational areas such as trails or campgrounds are examples of activities that reduce the amount of secure habitat that is available to grizzly bears. 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.

Habitat security for grizzly bears is measured annually in fifteen grizzly bear BMUs in the SRZ and CYRZ. The SRZ contains ten BMUs including five on the IPNF, four which are shared with CNF, and one BMU located on the Idaho Department of Lands (IDL). One of these BMUs, LeClerc, (which is primarily on the CNF with a minor portion on the IPNF) is less than 75 percent Federal ownership. Twenty-two BMUs are contained within the CYRZ, including 15 BMUs on the KNF, one BMU on the LNF, four BMUs on the IPNF, and two BMUs shared between the KNF and IPNF. One of these BMUs

(Grouse BMU on IPNF) is less than 75 percent Federal ownership. With the exception of the 28 square mile Lakeshore BMU in the SRZ, each BMU is approximately 100 square miles which represents the average home range of a female grizzly bear with cubs (Christensen and Madel 1982).

Controlling and directing motorized access is one of the most important tools in achieving habitat effectiveness and managing grizzly bear recovery. By controlling motorized access, certain objectives can be achieved including minimizing human interactions and potential grizzly bear mortality, reducing displacement from important habitats, and minimizing habituation to humans. Open Motorized Road Density (OMRD), Total Motorized Road Density (TMRD), and Core Area are four parameters used to quantify habitat security for the grizzly bear. These are explained in more detail below:

OMRD, TMRD, and Core Area

Research completed after the development of the Forest Plan indicated that open road density and security habitat calculations alone are not a complete measure of the effects of motorized access on grizzly bear habitat use, since grizzly bears tend to avoid closed roads as well as open roads (Mace and Manley 1993, Mace et al. 1996). Results from those studies demonstrated that grizzly bear use of an area declines as total road densities (open and closed roads) exceed 2.0 mi/mi^2 and open road densities exceed 1.0 mi/mi^2 (Mace and Manley 1993). In addition, if roads are located in or next to key habitat components such as riparian areas, snow chutes and shrub fields, important resources within these areas may be unused by bears because of their avoidance behavior, resulting in significant habitat loss. Core Area habitats are defined as areas of secure habitat within a BMU that contain no motorized travel routes or high use non-motorized trails during the active bear year and are more than 0.31 miles (500 meters) from a drivable road. These areas are an important component for adult female grizzly bears that have successfully reared and weaned offspring (IGBC 1994, 1998).

Within the SRZ and CYRZ, Wakkinen and Kasworm (1997) found that grizzly bears used the following conditions in regards to roads:

- Open Road Density > 1 mi/square miles (must be 33 percent or less of a BMU),
- Total Road Density > 2 mi/square miles (must be 26 percent or less of a BMU),
- Core Habitat must be at least 55% of the BMU

In 2011, the IPNF amended the 1987 Forest Plan to include motorized access standards for grizzly bears (USDA Forest Service 2011b ROD). Per the 2011 Biological Opinion (BO) on the amendment, habitat effectiveness was dropped as a standard and access standards were set for each BMU (greater than ≥75% federal ownership) with regards to OMRD, TMRD, and Core Area in order to maintain the recovery area in a condition that promotes viability of the grizzly bear population (USDI Fish and Wildlife Service 2011). In general, the BO adopted the Wakkinen and Kasworm (1997) access parameters (i.e. OMRD≤33%:TRMD≤26%:Core≥55) and spelled out timelines for implementation, administrative use, and reporting requirements. Table 30 displays the OMRD, TMRD and Core Area standards per the 2011 BO and the changes in those parameters by BMU from 2012 to 2014.

Specific actions that resulted in changes to access parameters for each BMU in the CYRZ and SRZ can be found in the annual reports to the U.S. Fish and Wildlife Service (USDA Forest Service 2013, 2014 and 2015).

Administrative Use

Per the 1998 IGBC recommendations (Selkirk Cabinet-Yaak Subcommittee of the Interagency Grizzly Bear Committee 1998) and 2011 BO (USDI Fish and Wildlife Service 2011), the IPNF has adhered to recommended standards to address the level of motorized use on restricted roads (i.e. behind gates). This parameter is applied on an individual road basis, with those roads that exceed the use limits being treated as "open" for purposes of calculating OMRD. Per the 2011 Biological Opinion, 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 have authorized to conduct Forest Service business behind these gates. The maximum number of allowable vehicle trips by bear season for each gate is as follows: Selkirk Ecosystem = 19 trips during spring (April 1 to June 14) + 23 trips during summer (June 15 to September 14) + 15 trips during fall (September 15 to November 15) = 57 total; Cabinet-Yaak Ecosystem = 18 trips during spring (April 1 to June 14) + 23 trips during summer (June 15 to September 14) + 19 trips during fall (September 15 to November 15) = 60 total. Administrative use needs change from year to year. Table 31 and Table 32 illustrate administrative use for the Selkirk and Cabinet-Yaak recovery zones, 2012-2014.

Table 30. Cabinet-Yaak and Selkirk Bear Management Bear Management Unit Summary for the 2012-2014 Bear Year (Cabinet-Yaak = April 1 – November 30; Selkirks = April 1 – November 15).

Recovery Zone	Bear Management Unit	Access Parameter	Access Parameter Standard	2012	2013	2014
CABINET-YAAK	Keno	OMRD (%)	33	33	32	33
		TMRD (%)	26	24	24	26
		CORE (%)	59	60	60	59
	Northwest Peak	OMRD (%)	31	35	28	31
		TMRD (%)	26	26	26	26
		CORE (%)	55	56	55	55
	Boulder	OMRD (%)	33	32	31	33
		TMRD (%)	29	32	32	29
		CORE (%)	55	51	51	55
	Grouse[1]	OMRD (%)	59	60	59	59
		TMRD (%)	55	59	59	55
		CORE (%)	37	31	32	37
	North Lightning	OMRD (%)	35	36	36	36
		TMRD (%)	20	20	20	20
		CORE (%)	61	63	63	63
	Scotchman	OMRD (%)	34	33	33	34
		TMRD (%)	26	25	24	25
		CORE (%)	62	67	67	67
SELKIRK	Blue Grass	OMRD (%)	33	30	32	29
		TMRD (%)	26	28	28	28
		CORE (%)	55	50	50	50
	Long-Smith	OMRD (%)	25	21	21	21
		TMRD (%)	15	15	15	15
		CORE (%)	67	72	72	72
	Ball-Trout	OMRD (%)	20	18	16	16
		TMRD (%)	13	11	11	11
		CORE (%)	69	72	72	72

Recovery Zone	Bear Management Unit	Access Parameter	Access Parameter Standard	2012	2013	2014
	Myrtle	OMRD (%)	**33**	30	29	30
		TMRD (%)	**22**	20	20	21
		CORE (%)	**56**	60	60	60
	Salmo-Priest	OMRD (%)	**33**	30	31	30
		TMRD (%)	**26**	24	24	24
		CORE (%)	**64**	67	66	67
	Sullivan-Hughes	OMRD (%)	**24**	24	23	23
		TMRD (%)	**19**	19	19	19
		CORE (%)	**61**	64	64	64
	Kalispell-Granite	OMRD (%)	**33**	30	30	30
		TMRD (%)	**26**	23	23	23
		CORE (%)	**55**	55	55	55
	Lakeshore	OMRD(%)	**82**	80	80	80
		TMRD(%)	**56**	44	44	44
		CORE (%)	**20**	22	22	22
	Le Clerc[2]	OMRD (%)	**40**	42	45	45
		TMRD (%)	**58**	58	58	58
		CORE (%)	**27**	27	27	27

CYRZ Administrative Use: During Bear Year 2012-2014 in the CYRZ, there were a few instances where administrative use levels exceeded allowable seasonal or total use levels (Table 31). These occurred in the NW Peaks, Boulder and Grouse BMUs.

Table 31. Seasonal administrative use on the IPNF within the Cabinet-Yaak Recovery Zone by Bear Management Unit (BMU), 2012-2014

Bear Management Unit	Bear Year Season and Total # of Roads that Exceeded Use Levels	Total Number of Restricted Roads Exceeding Administrative Use Levels By Year (Total Number of Restricted Roads with		
		2012	2013	2014
Keno	Spring	0	0	0
	Summer	0	0	0
	Fall	0	0	0
	Total	0 (1)	0 (3)	0 (0)
Northwest Peaks	Spring	0	2	0
	Summer	3	2	0
	Fall	1	2	0
	Total	1 (8)	2 (14)	0 (2)
Boulder	Spring	0	0	0
	Summer	1	0	0
	Fall	1	0	1
	Total	0 (5)	0 (4)	0 (6)
Grouse	Spring	0	0	0
	Summer	1	0	0
	Fall	1	0	1
	Total	0 (4)	0 (3)	0 (5)
North Lightning	Spring	0	0	0
	Summer	0	0	0
	Fall	0	0	0
	Total	0 (0)	0 (0)	0 (0)
Scotchman	Spring	0	0	0
	Summer	0	0	0
	Fall	0	0	0
	Total	0 (0)	0 (0)	0 (0)

Note: Once roads exceeded allowable round trips, they were considered open for analysis purposes for the remainder of the bear year.

SRZ Administrative Use: During Bear Year 2012 in the SRZ, there were several instances where administrative use levels exceeded allowable seasonal or total use levels (Table 32). These were most notable in the Blue Grass and LeClerc BMUs.

Table 32. Seasonal administrative use on the IPNF within the Selkirk Recovery Zone by Bear Management Unit, 2012-2014

Bear Management Unit	Bear Year Season and Total # of Roads that Exceeded Use Levels	Total Number of Restricted Roads Exceeding Administrative Use Levels By Year (Total Number of Restricted Roads with		
		2012	2013	2014
Blue Grass	Spring	0	0	0
	Summer	9	3	1
	Fall	7	3	4
	Total	4 (10)	2 (11)	4 (11)
Long Smith	Spring	0	0	0
	Summer	0	1	0
	Fall	0	0	0
	Total	0 (1)	0 (1)	0 (2)
Kalispell Granite	Spring	0	0	0
	Summer	0	0	0
	Fall	2	2	0
	Total	1	1 (9)	0 (6)
Salmo Priest	Spring	1	0	0
	Summer	0	0	0
	Fall	0	0	0
	Total	0 (8)	0 (9)	0 (8)
Sullivan Hughes	Spring	0	0	0
	Summer	0	0	0
	Fall	0	0	1
	Total	0 (6)	0 (4)	Unk[1] (2)
Myrtle	Spring	0	0	0
	Summer	0	0	0
	Fall	1	0	0
	Total	0 (2)	0 (3)	0 (1)
Ball Trout	Spring	0	0	0
	Summer	0	0	0
	Fall	1	1	0
	Total	0	0 (3)	0 (2)
Lakeshore	Spring	0	0	0
	Summer	0	0	0
	Fall	0	0	0
	Total	0	0 (2)	0 (1)
LeClerc	Spring	0	0	2
	Summer	0	1	3
	Fall	0	8	6
	Total	0 (8)	Unk[1] (21)	4 (18)

Note: Once roads exceeded allowable round trips, they were considered open for analysis purposes for the remainder of the Bear Year.

[1]Unknown due to high level of use during logging operations.

Gate and Barrier Monitoring

Per the 2001 BO, the IPNF is required to monitor at least 10 percent of restricted roads to provide a reliable count of the combined Forest Service and industry administrative use occurring on these roads. Table 33 summarizes the annual monitoring completed on existing gates and barriers located within the respective grizzly bear recovery zones on the Idaho Panhandle National Forests, 2012-2014. Beginning in 2012, the forests are required to ensure at least 30 percent of all gates and barriers within the respective recovery zone are monitored annually (USDI Fish and Wildlife Service 2011).

In 2012, the IPNF monitored 86 and 50 percent of all gates and barriers under IPNF administrative authority in the SRZ and CYRZ, respectively. The following year, the Forest monitored 89 and 50 percent of all gates and barriers in the SRZ and CYRZ, respectively. In 2014, the IPNF monitored 58 and 48 percent of all gates and barriers in the SRZ and CYRZ, respectively.

Table 33. Summary of restricted and closed route monitoring within the Selkirk and Cabinet-Yaak Recovery Zones located on the Idaho Panhandle NF, 2012-2014*

Grizzly Bear Recovery Zone	Closures and Monitoring	2012			2013			2014		
		Gates	Barriers	Total	Gates	Barriers	Total	Gates	Barriers	Total
Selkirk	Number of Closures	79	24	103	77	25	102	63	25	88
	Number Monitored	71	18	89	66	25	91	51	0	51
	Percent Monitored	90 %	75 %	86 %	59 %	100 %	89 %	81 %	0	58 %
Cabinet-Yaak	Number of Closures	49	37	86	48	38	86	48	37	85
	Number Monitored	41	2	43	40	3	43	39	2	41
	Percent Monitored	84 %	5 %	50 %	83 %	8 %	50 %	81 %	5 %	48 %

*Data is on file at the Bonners Ferry, Sandpoint, and Priest Lake Ranger Stations.

Record of Restricted Road Closure Repairs (Gates and Berms)

Maintenance and repair of the existing closure devices within the recovery zones is an on-going process of site inspection and implementation of repairs and enhancements. Table 34 documents the repairs and maintenance that occurred within the recovery zones in 2012-2014 by BMU. Most maintenance involved placing concrete posts and/or boulders, or digging trenches adjacent to gates.

In 2012, $5,012 was allocated to implement closure maintenance and repairs within the two recovery zones. In 2013, $1,200 was used to purchase new locks. The following year, $8,000 was spent on repairing gates.

Table 34. Summary of restricted and closed route maintenance by gate number within the Selkirk and Cabinet-Yaak Recovery Zones located on the Idaho Panhandle NF, 2012 and 2014*

Recovery Zone	Bear Management Unit	2012	2014
Selkirk	**Blue Grass**	FR2213/2251-Gate 100; FR1009-Gate 3; FR2464-Gate 40; FR2254C-Gate 2	
	Long Smith		FR2251 Gate; FR2454C Gate
	Kalispell Granite	FR656/Gate103; FR401-Gate 104	FR1373-Gate 106; FS2231A-Gate 110; FR401-Gate 104; FR1362H-Gate 25; FR311-Gate 115
	Salmo Priest		
	Sullivan Hughes	FR1343/Gate9; FR1399/Gate12	
	Myrtle	FR2411-Gate 120	FR2566-Gate 121
	Ball Trout		FR2489-Gate 031
	Lakeshore	FR2242-Gate 72	FR238-Gate 70
Cabinet –Yaak	**Keno**	FR2225-Gate 20; Buckhorn Mine Road	
	Northwest Peaks		
	Boulder		FR2267-Gate 22; FR2662-Gate 24
	Grouse	FR2236-Gate 203; FR2656B-Gate 236; FR2656C-Gate 235; Trail 483-Berm 249;	FR215-Gate 246; FR2636-Gate 203;
	North Lightning		FR232B-Berm 253; FR2640E-Gate 211; FR2641-Gate 257
	Scotchman		FR2294B-Gate 247

*Repairs slated for 2013 were delayed due to contracting issues associated with the government furlough and were subsequently completed in 2014.

Bears Outside Recovery Zones (BORZ)

There are seven grizzly bear recurring use areas associated with the CYRZ and SRZ, and three of these are located exclusively on the IPNF (Allen 2011). These areas are referred to as 'Bears Outside Recovery Zones' (BORZ). The IPNF is required to ensure "no permanent increases in the total linear miles of "open roads" and "total roads" on National Forest System lands in any individual BORZ area above baseline conditions, except in cases where the Forests lacks discretion to prevent road building across national forest lands due to legal or other obligations (USDA Forest Service 2011b; USDI Fish and Wildlife Service 2011). Any potential increases in linear miles of open or total roads must be compensated for with in-kind reductions concurrently or prior to such increases (ibid).

Per annual conversations with agency biologists each winter, there have not been enough new grizzly bear sightings outside the recovery area to alter the existing BORZ boundaries (Kasworm pers. comm. 2013, Wakkinen pers. comm. 2013, Kasworm pers. comm. 2014, and Kasworm pers. comm. 2015). Table 35 displays the size, land ownership, and linear miles of open and total roads for the BORZ areas.

Table 35. Bear Year 2012-2014 motorized access conditions for Bears Outside of Recovery Zone areas on National Forest System lands

Bears Outside Recovery Zone	Grizzly Bear Recovery Zone	Total Size (Acres)	Total Area (Acres)	Total Roads (Miles) 2010/2012-2014[1]	Open Roads (Miles) 2010/2012-2014[1]
Priest Lake	Selkirk	80,733	75,793	316.4 (319.0)[2]	314.4 (317.0)[2]
Pack River	Selkirk	33,869	28,097	41.9 (37.7)[3]	37.9 (33.7)[3]
Mission-Moyie	Cabinet-Yaak	71,545	58,472	200.3 (200.3)	167.3 (167.3)

[1]2010 represents the environmental baseline identified in the amendments to the Forest Plan (USDA Forest Service 2011b).

[2]GIS correction to include 2.6 linear miles of total and open road based on review of the Motorized Vehicle Use Map. This includes two sections of roads (0.2 near Lamb Creek Road and 2.4 miles of FR1342) that were inadvertently left out of of the 2010 environmental baseline for this BORZ.

[3]Road miles decreased in Bear Year 2011 due to road decommissioning of 4.25 linear miles of road (USDA Forest Service 2012).

Population Research Efforts

In 2011, the IPNF proposed a re-collaring effort for the Selkirk ecosystem (SE) to help quantify population trends and further efforts to develop a good quality seasonal habitat map for the area. It has been almost a decade since grizzly bears were radio-collared in the U.S. portion of the Selkirk Ecosystem. To that end, the Forest allocated $28,000 to purchase remotely down-loadable GPS radio collars, a transceiver, and trap monitors. The research effort is led by the U.S. Fish and Wildlife Service and Idaho Department of Fish and Game.

From 2012 to 2014, the Forest allocated over $45,000 in Forest Service funding and another $54,000 in Rural School Committee funding to this effort. In addition, the Forest was successful in procuring a $25,000 grant from the U.S. Fish and Wildlife Service in 2012 and again in 2015. Funding was used to support everything from aerial flight time, vehicles for research crews, equipment, and personnel time for the DNA hair-snare effort and trapping crew.

Radio-telemetry data provides important information such as survival rates, cause of mortality, reproductive output, cub survival and identification of seasonal ranges and dispersal. Three female grizzly bears were radio-collared in 2012 and another four females were captured and collared in 2013. In 2014, the first male grizzly bear was captured and outfitted with a radio-collar. By the end of 2014, a total of six grizzly bears (One of the previously radio collared females had dropped her collar) were being monitoring by the U.S. Fish and Wildlife Service in the U.S. portion of the Selkirk ecosystem. DNA hair snare and infrared cameras techniques were used to document grizzly bear distribution and help further development of a genetic database of individual grizzly bears in the ecosystem. Please see Kasworm et al. 2014, Kasworm et al. 2015b, and Wakkinen 2012 and 2013 for details on the research accomplishments.

Literature Cited

Allen, L. 2011. A review of grizzly bear recurring use areas associated with the Selkirk and Cabinet-Yaak recovery zones. Unpublished USDA Forest Service report. 20 pp.

Christensen, A. G. and J. J. Madel. 1982. Cumulative effects analysis process: grizzly habitat component mapping. USDA Forest Service Report. Kootenai National Forest. 63 pp.

Federal Register. 1999. Federal Register 50 CFR Part 17. Endangered and threatened wildlife and plants: 12-month finding on petitions to change the status of grizzly bear populations in the Selkirk area in Idaho and Washington and the Cabinet-Yaak area of Montana and Idaho from threatened to endangered. Volume 64, No. 94; p. 26725-26733.

Interagency Grizzly Bear Committee (IGBC). 1994. Taskforce Report: Grizzly bear / motorized access management. Interagency Grizzly Bear Committee. 8 pp.

Interagency Grizzly Bear Committee (IGBC). 1998. Taskforce Report: Grizzly bear / motorized access management. Interagency Grizzly Bear Committee. 8 pp.

Kasworm, W., M. Proctor, C. Servheen, and D. Paetkau. 2006. Success of grizzly bear population augmentation in northwest Montana. Journal of Wildlife Management 71:1261-1266.

Kasworm, W. M., T. G. Radant, and A. Welander. 2014. 2014 Autumn Cabinet-Yaak and Selkirk Mountains grizzly bear ecosystems update. 2 pp.

Kasworm, W., T. G. Radandt, J. E. Teisberg, A. Welander, M. Proctor, and C. Servheen. 2015a. Cabinet-Yaak Grizzly Bear Recovery Area 2014 research and monitoring progress report. U.S. Fish and Wildlife Service, Missoula, Montana. 96 pp.

Kasworm, W., , A. Welander, T. G. Radandt, J. E. Teisberg, W. Wakkinen, M. Proctor, and C. Servheen. 2015. Selkirk Mountain Recovery Area 2014 research and monitoring progress report. U.S. Fish and Wildlife Service, Missoula, Montana. 37 pp.

Kendall, K. W., A. C. Macleod, K. L. Boyd, J. Boulanger, J. A. Royle, W. F. Kasworm, D. Paetkau, M. F. Proctor, K. Annis, and T. A. Graves. 2015. Density, distribution, and genetic structure of grizzly bears in the Cabinet-Yaak ecosystem. Journal of Wildlife Management. Article first published online: 15 NOV 2015: DOI: 10.1002/jwmg.1019.

Mace, R. D. and T. L. Manley. 1993. South Fork Flathead River grizzly bear project. Progress report for 1992. Montana Department of Fish, Wildlife, and parks, Kalispell, Montana.

Mace, R. D., J. S. Waller, T. L. Manley, L. J. Lyon, and H Zuuring. 1996. Relationships among grizzly bears, roads, and habitat in the Swan Mountains, Montana. Journal of Applied Ecology. 33:1395-1404.

Proctor, M. F., C. Servheen, S. D. Miller, W. F. Kasworm, and W. L. Wakkinen. 2004. A comparative analysis of management options for grizzly bear conservation in the U.S.-Canada trans-border area. Ursus 15:145-160.

Proctor, M. F., J. Boulager, S. Nielsen, C. Servheen, W Kasworm, T Radandt, and D. Paetkau. 2007. Abundance and density of Central Purcell, South Purcell, Yahk, and south Selkirk Grizzly Bear Population Units in southeast British Columbia. Report to the B.C. Ministry of Environment, Nelson and Victoria, British Columbia. 30 pp.

Servheen, C., W. Kasworm, and A. Christensen. 1987. Approaches to augmenting grizzly bear populations in the Cabinet Mountains of Montana. International Conference on Bear Research and Management 7:363-367.

USDA Forest Service. 2011b. Record of Decision. Forest Plan amendments for motorized access management within the Selkirk and Cabinet-Yaak grizzly bear recovery zones. Kootenai, Lolo and Idaho Panhandle National Forests. November 2011. 74 pp.

USDA Forest Service. 2013. Cabinet-Yaak/Selkirk grizzly bear recovery zones 2012 annual monitoring summary report: Kootenai, Lolo and Idaho Panhandle National Forests. Unpublished report. 13 pp.

USDA Forest Service. 2014. Cabinet-Yaak/Selkirk grizzly bear recovery zones 2013 annual monitoring summary report: Kootenai, Lolo and Idaho Panhandle National Forests. Unpublished report. 13 pp.

USDA Forest Service. 2015. Cabinet-Yaak/Selkirk grizzly bear recovery zones 2014 annual monitoring summary report: Kootenai, Lolo and Idaho Panhandle National Forests. Unpublished report. 12 pp.

USDI Fish and Wildlife Service. 1990. Final environmental assessment - grizzly bear population augmentation test, Cabinet-Yaak ecosystem. U.S. Fish and Wildlife Service, Missoula, Montana.

USDI Fish and Wildlife Service. 1993. Grizzly bear recovery plan. Missoula, MT. 181 pp.

USDI Fish and Wildlife Service. 2011. Endangered Species Act Section 7 Consultation Biological Opinion on the Forest Plan Amendments for Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones on the Kootenai, Idaho Panhandle, and Lolo National Forests. US Fish and Wildlife Service, Montana Field Office, Kalispell, MT, and Northern Idaho Field Office, Spokane, WA. 227 pp.

Wakkinen, W. L. 2012. Research and management update to the Selkirk/Cabinet-Yaak IGBC subcommittee, Fall 2012. Dated December 6, 2012. 2 pp.

Wakkinen, W. L. 2013. Research and management update to the Selkirk/Cabinet-Yaak IGBC subcommittee, Fall 2013. Dated December 3, 2013. 2 pp.

Wakkinen, W. L. and W. F. Kasworm. 1997. Grizzly bears and road density relationships in the Selkirk and Cabinet-Yaak and Selkirk zones. Interagency Grizzly Bear Committee. 28 pp.

Wakkinen, W.L. and B.K. Johnson. 2000. Selkirk ecosystem project. Study 1: Selkirk Selkirk Mountains grizzly bear ecology; Study II: Caribou Transplant; and Study III: Grizzly bear enforcement and education project. Idaho Department of Fish and Game Threatened and Endangered species project annual report. 1997-1998. Project E-14-4. 49 pp.

Wakkinen, W. L. and W. F. Kasworm. 2004. Wakkinen, W. L. and W. F. Kasworm. 2004. Demographics and population trends of grizzly bears in the Cabinet-Yaak and Selkirk Ecosystems of British Columbia, Idaho, Montana and Washington. Ursus Workshop Supplement. 15(1):65-75.

Wakkinen, W.L., B.K. Johnson, and J.B. Slone. 2009. Selkirk ecosystem project. Study 1: Selkirk

Mountains grizzly bear ecology; Study II: Caribou Transplant; and Study III: Grizzly bear enforcement and education project. Idaho Department of Fish and Game Threatened and Endangered species project annual report. Project E-14-12. 8 pp.

Wakkinen, W. L., B. K. Johnson, and B. Moore. 2010. Selkirk Ecosystem project. January 2009 – July 2010. Idaho Department of Fish and Game. Threatened and endangered species project, E-14-15. August 2010. 46 pp.

Forest Plan Monitoring Item F-3 Caribou Recovery

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

Background

The Selkirk population of woodland caribou was listed as endangered by the U.S. Fish and Wildlife Service under an emergency listing process in 1983, with a final rule published in 1984 (USDI Fish and Wildlife Service 1985). At the time of listing, the population consisted of some 25-30 animals with a distribution situated around Stagleap Provincial Park in British Columbia and the nearby international border (Scott and Servheen 1985). The recovery area for caribou in the Selkirk Mountains is comprised of approximately 1,471 square miles in southern British Columbia, northeastern Washington and northern Idaho. Fifty-three percent of the recovery area is located in British Columbia, while the remaining 47 percent falls within the U.S.

The decline in woodland caribou numbers has been generally attributed to habitat loss, habitat fragmentation, and excessive mortality by predators and humans (Mountain Caribou Technical Advisory Committee 2002, USDI Fish and Wildlife Service 1985 and 1994). More recently, the FWS concluded that the major threats to woodland caribou in the Selkirk population at this time were past and ongoing habitat destruction/fragmentation, predation (by mountain lions and wolves), human access, inadequate regulatory mechanisms (to address timber harvest and winter recreation on some Federal, State and private lands), small population size, and potentially climate change (USDI Fish and Wildlife Service 2008).

Population Status

An intermediate population target of 100-109 caribou was initially set in the first Recovery Plan for woodland caribou (USDI Fish and Wildlife Service 1985). However, this target was not assumed to be a recovered population, with additional genetics and population modeling work required to reevaluate population viability and a recovered population size (USDI Fish and Wildlife Service 1994). In the short term, the 1994 Plan set a goal of maintaining two herds (in British Columbia and Idaho) and the desire to establish a herd in Washington as well (ibid).

As part of the plan for their recovery, caribou were reintroduced into the ecosystem from populations in British Columbia (USDA Forest Service 1985). In 1987, 1988, and 1990, a total of 60 caribou were augmented into the Idaho portion of the ecosystem. As a result of these efforts the population within the southern Selkirks increased to approximately 55 to 70 animals by 1990. However, the population declined in 1996 in what is believed to be the result of increased rates of predation (Wakkinen and Johnson 2000). A subsequent reintroduction effort was conducted in 1996 and 1997 to place 32 caribou into the Washington portion of the ecosystem, followed by a 1998 effort to release 11 additional caribou into the British Columbia portion of the recovery area (Almack 2000, USDI Fish and Wildlife Service 2008). However, similar declines were noted in the Washington portion of the recovery area (Almack 2000).

Winter Census

As part of the Recovery Plan, a census technique for woodland caribou was developed and initiated in 1991 by the Idaho Department of Fish and Game (IDFG) to provide a minimum population and recruitment estimates (Wakkinen et al. 1996, USDI Fish and Wildlife Service 1994 and 2008). The technique quantifies the factors affecting viability and provides statistically valid population estimates. The census is conducted in the winter (February through April) when caribou are at higher elevations and in open-canopy forests. It involves a two-phase aerial survey using a "pre-survey" fixed-wing aircraft flight and a subsequent helicopter survey flight to note distribution, total numbers, and recruitment (via classification of adults versus calves) (Wakkinen et al. 1996). This technique is similar to what has been developed and implemented by others to accurately census big game populations (Resource Inventory Committee 2002). The population census effort provides the most accurate picture of woodland caribou numbers and distribution during the late winter season.

Minimum population estimates of 27 caribou were documented during the 2012 winter census, with four animals located around the Little Snowy Top area in the United States (DeGroot and Wakkinen 2012). A total of 23 and 18 caribou were observed during the 2013 and 2014 censuses, respectively, but none of these animals were located in the United States (Degroot 2014). The British Columbia portion of the Selkirk subpopulation was variable but somewhat stable until 2009, but has declined by 61 percent since that time. Sightings of packs of up to 15 wolves have been reported in the area several times since 2009 and predation by wolves has been thought to be a main factor in the population decline (DeGroot 2014). A suspected wolf predation was documented during the 2014 winter census. This is the first evidence of wolf predation within the South Selkirk herd in this time period (ibid).

The 2016 census of 12 animals for the entire subpopulation was roughly a quarter of what was found in 2009 (46 animals). Woodland caribou have not been observed south of the Little Snowy Top area during the combined winter census or snowmobile closure monitoring efforts since March of 2007 (DeGroot 2014). At that time, a lone caribou was observed in the upper portion of the Ball Creek drainage (Wakkinen et al. 2007). Table 36 displays trends in the population since the inventory began in 1991.

Table 36. Trends in the southern Selkirk Mountain woodland caribou population size including resident and translocated caribou, 1991-2014 (Wakkinen pers. comm. 2016)[2]

Year	United States	British Columbia	Total
1991	26	21	47
1992	24	23	47
1993	23	28	51
1994	13	32	45
1995	10	39	49
1996	12	27	39
1997[1]	9	30	39
1998[2]	31	14	45
1999[3]	6	42	48
2000	3	31	34
2001	Poor snowpack—no census conducted		
2002	2	32	34
2003	1	40	41
2004	3	30	33

[2] The 2015 and 2016 censuses documented just 14 and 12 caribou, respectively (DeGroot 2015 and 2016).

Year	United States	British Columbia	Total
2005	2	33	35
2006	1	36	37
2007	2	41	43
2008	3	43	46
2009	3	43	46
2010	2	41	43
2011	0	36	36
2012	4	23	27
2013	0	27	27
2014	0	18	18

[1]Includes 19 animals released in 1996.

[2]Includes 13 animals released in 1997.

[3]Includes 11 animals released in 1998.

Forest Plan Direction

Habitat Management

Appendix N of the 1987 Idaho Panhandle National Forests Forest Plan listed specific habitat management guidelines for caribou. 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 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.

A stand-based habitat suitability index (HSI) and habitat capability index (HCI) was developed as part of the 1987 IPNF Forest Plan (USDA Forest Service 1987). Subsequent updates and evaluation of the Idaho/Washington portion of the recovery area were used for land management decisions from 1994 to 2007 (Allen and Deiter 1994, and Allen 1998). A landscape level habitat priority model was developed in 2007 to facilitate a unified broad-scale assessment of caribou habitat throughout the recovery zone (Kinley and Apps 2007). This effort provided a statistically rigorous approach to habitat selection than the more simplistic, expert opinion derived HSI models (Antifeau 1998). However, this model is ecosystem-based and not intended for stand or drainage-level use (Kinley and Apps 2007) and was run using 2006 and older[3] vegetation data, making it less useful for project-specific land management analyses after 2007.

A more recent habitat mapping effort used in forest plan revision describes available habitat in terms of site potential, dominant forest cover type and forest stand age within the recovery zone (Allen 2013). This approach is more useful when discussing potential effects due to land management activities on habitat (e.g. timber harvest, prescribed burning) because of its simplicity and emphasis on existing vegetation conditions in terms of cover type and stand age[4]. It also allows for consistently monitoring habitat changes over time. Currently, the majority of preferred caribou habitat within the recovery area is greater than 100 years old, and these habitats are well distributed throughout U.S. portion of the recovery area

[3] The model was developed and run by a B.C. consulting firm and the USFS does not have the capability to rerun the analysis using more recent data.

[4] Stand age is a useful predictor of arboreal lichen abundance (Stevenson et al. 2001).

(ibid). Habitat is not considered to be limiting the growth of the population at this time (USDI Fish and Wildlife Service 2008).

Winter Recreation

The 2001 Amended Biological Opinion for the Continued Implementation of the Idaho Panhandle National Forests Land and Resource Management Plan[5] (USDI Fish and Wildlife Service 2001), emphasized that increasing recreation pressure (during both winter and summer seasons) was decreasing habitat effectiveness for caribou. This included potential increases in caribou harassment, displacement, and possible injury in late winter habitats by snowmobile recreational activity (ibid).

The IPNF began implementing site-specific motorized over-the-snow closures to protect caribou in 1993. However, in response to the amended 2001 BO, the Forest responded with an increased emphasis on educating the public of the effects of winter recreation on caribou, denoting area closures and monitoring their effectiveness. Subsequent implementation included enhanced information and education efforts and aerial monitoring of recreation versus caribou use. However, litigation in 2005 resulted in a 2007 injunction to preclude snowmobile use within much of the caribou recovery zone until the Forest completed a Winter Travel Plan (i.e. Court Order NO. CV-05-0248-RHW). Since 2007, the IPNF has conducted a limited number of aerial patrols and some snowmobile ground patrols in order to enforce this closure. Additional monitoring efforts have been conducted by representatives from the Selkirk Conservation Alliance (SCA) and the Idaho Conservation League (ICL) with support from Advocacy of the West, Defenders of Wildlife, and the Kalispel Tribe of Indians. Monitoring of the area has been facilitated by monthly conference calls (January – April) between agency and interest group representatives (Notes on File).

2012-2014 Winter Aerial Monitoring

Fixed-wing aerial monitoring of the snowmobile closure is used to determine where violations are most likely to occur, and helps focus subsequent on-the-ground compliance patrols and signage to reduce or eliminate further incursions into the closure. The number of winter patrols are limited by suitable flying conditions which are largely influenced by the weather (i.e. amount/type of precipitation, wind, and visibility). While snowmobilers are occasionally observed during these flights, this type of monitoring effort typically results in an assessment of snowmobile activity after it has occurred in a given area. Therefore, it cannot typically be used to determine the intensity (i.e. how many riders) and duration of the snowmobiling activity. The technique is also limited by the observer's ability to see tracks from the air which is influenced by existing snow conditions, surface winds, aspect, elevation, amount of vegetation, and time of day (i.e. amount and direction of sunlight and associated shadows). Likewise, a lack of recent snowfall can make it difficult for the observer to discern old tracks from more recent snowmobile activity which increases the potential for "double" counting tracks in a given area. Finally, it can be difficult to discern where the closure boundary is from the air with a high degree of precision. This may result in some observed tracks being counted as "violations" when the rider may have been just outside the closure boundary. Subsequent ground patrols are helpful in discerning whether a violation occurred or not.

In general, the number of aerial monitoring flights dropped in 2012-2014 when compared to previous years. This was true both on the part of the Forest Service as well as outside groups that have supported

[5] The 2001 Biological Opinion for the continued implementation of the 1987 Forest Plan was necessary in order to comply with the revised regulations governing section 7 procedures of the Endangered Species Act. The 2001 BO administratively amended the original 3/24/1986 biological opinion to include an analysis of incidental take and an incidental take statement pursuant to CFR Part 402.14(i) (USDI Fish and Wildlife Service 2001).

the effort. This was not a result of a lack of funding from the Forest Service which routinely budgeted funding for 8-10 hours of flight time annually. Poor weather conditions and/or a lack of trained personnel when the weather was good for flying were contributing factors.

In 2012, two flights were made to document snowmobile use in-and-around the snowmobile closure area. Both flights were conducted by SCA representatives. Violations of the caribou closure on NFS lands (> 100 meters inside boundary) were noted in four general areas. Specific locations include the Continental Mountain, West Fork Cabin, from Trapper Creek into Cow Creek, and the upper end of Grass Creek[6]. In several instances it appeared that the snowmobiles were entering the closure area from access points on the Idaho Department of Lands. Most violations were concentrated in-or-around the court-ordered 'movement corridor' located in the 1967 Trapper Creek Burn, and more than 6 miles from documented caribou use near Little Snow Top Mountain.

Two flights were conducted in 2013 by IPNF and SCA representatives. Violations of the caribou closure (> 100 meters inside boundary) were noted at Continental Mountain, east of Bunchgrass Meadows, West Fork Cabin, unnamed lake west of Big Snowy Mountain, and within the Trapper Creek to Cow Creek area. In the case of the unnamed lake, the snowmobilers were accessing the area from British Columbia.

In 2014, three flights were conducted by representatives from SCA and ICL. Snowmobiling was noted within the closure in and around Continental Mountain, West Fork Cabin, upper Cow Creek, the small unnamed lake west of Big Snow Mountain, Bunchgrass Meadows, and upper Grass and Blue Joe Creeks. Violations of the closure order also occurred via 'snowcycles' at Two Mouth Lakes, Myrtle Lake, Harrison and Beehive Lakes.

Population Research Monitoring

In late 2013, the IPNF facilitated the creation of an ad hoc committee of Selkirk caribou supporters at the behest of the British Columbian government. This was prompted by the dramatic decrease in caribou numbers observed during the 2010-2012 winter censuses. The resulting committee developed a short term plan to radio collar up to 10 caribou with the objective of monitoring their movements/distribution and determining sources of mortality. The IPNF provided $5,000 for helicopter flight time to facilitate animal capture. Other participates includes representatives from Idaho Department of Fish and Game, Washington Department of Fish and Wildlife, Kalispel Tribe, U.S. Fish and Wildlife Service and the Colville National Forest.

The collaring effort was implemented in March of 2014 and resulted in five caribou (2 cows; 3 bulls) being fitted with Vetronic GPS Vertex collars. During this same time period, biologists conducting the winter census observed the remains of one of the remaining 19 caribou. Evidence at the scene suggested the caribou was eaten and perhaps killed by wolves. This was the first evidence of wolf predation on this population. A confirmed wolf kill of a radio collared bull was confirmed in September of 2014.

In addition, the Forest was successful in procuring a $10,000 grant from the U.S. Fish and Wildlife Service in 2014 to support this new population monitoring effort. Funding was used to support aerial flight observation data, population data and trends since the 1998.

[6] These tracks may have been from a Customs and Border Patrol (CBP) field review based on conversations with CBP officers. CBP has the legal authority to patrol within the closure area per the Closure Order.

Literature Cited

Allen, L. R. and D. Deiter. 1994. A habitat suitability index for woodland caribou. Idaho Panhandle National Forest, Coeur d'Alene, ID.

Allen, L. R. 1998. An updated habitat suitability index for woodland caribou. Idaho Panhandle National Forest, Coeur d'Alene, ID.

Almack, J. A. 2000. Mountain caribou recovery in the southern Selkirk Mountains of Washington, Idaho, and British Columbia. Progress Report for October 1998-March 2000. Washington Department of Fish and Wildlife. Section 6 Contract No. E-1-45. Olympia, WA. 33 pp.

Antifeau, T. D. 1998. Identification of issues involved in the process of developing and applying caribou habitat suitability. B.C. Ministry of Environment, Lands and Parks. Kootenay Region, Nelson, B.C. 28 pp.

DeGroot, L. 2016. 2016 Caribou census: South Selkirk Mountains. B.C. Ministry of Forests, Lands, and Natural Resources. 8 pp.

DeGroot, L. 2015. 2015 Caribou census: South Selkirk Mountains. B.C. Ministry of Forests, Lands, and Natural Resources. 8 pp.

DeGroot, L. 2014. 2014 Caribou census: South Selkirk Mountains. B.C. Ministry of Forests, Lands, and Natural Resources. 8 pp.

DeGroot, L. and W. Wakkinen. 2012. 2012 Woodland caribou census: South Selkirk Mountains. B.C. Ministry of Natural Resource Operations. 6 pp.

Kinley, T. and C. Apps. 2007. Caribou habitat modeling for the South Selkirk ecosystem including habitat assessments for the Priest Lake Endowment Lands. Unpublished Report. 52 Pages.

Mountain Caribou Technical Advisory Committee (MCTAC). 2002. A strategy for the recovery of mountain caribou in British Columbia. Version 1. British Columbia Ministry of Water, Land, and Air Protection. 73 pp.

Scott, M.D. and G. Servheen 1985. Caribou ecology. Idaho Department of Fish and Game P-R Job Progress Report. Project Number W-160R-11.136 pp.

USDA Forest Service. 1985. Selkirk Mountains caribou herd augmentation: a cooperative interagency plan. Idaho Panhandle National Forests, Coeur d'Alene, ID. 62 pp.

USDI Fish and Wildlife Service. 1985. Selkirk Mountain caribou management plan. Portland, Oregon. 118 pp.

USDI Fish and Wildlife Service. 1994. Recovery plan for woodland caribou in the Selkirk Mountains. Portland, Oregon. 71 pp.

USDI Fish and Wildlife Service. 2008. Southern Selkirk Mountain Caribou Population 5-Year review: summary and evaluation. Upper Columbia Fish and Wildlife Office. Spokane, WA. 38 pp.

Wakkinen, W., B. B. Compton, P. Zager, and J.R. Skalski. 1996. A census technique for monitoring woodland caribou. Idaho Department of Fish and Game.

Wakkinen, W., R. Clarke, and G. Mowat. 2007. 2007 Woodland caribou census-South Selkirk Mountains. 4 pp.

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.

Water quality and water resource monitoring is intended to demonstrate that action 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 demonstrated that present and past projects were usually successful in meeting their intended objectives (See section K-1 for BMP monitoring results related to the soil resource).

All monitoring was done by Forest specialists and/or employees. Monitoring on the Forest Road 2627 was done with a representative of the Idaho Conservation League on July 23, 2013.

Summary of Road Decommissioning and Storage Monitoring

Waterbars installed

Water bars were installed on Forest Road 2112, Forest Road 2411A and Forest Road 2627 (Pouch Creek Rd) in the fall of 2011. They were monitored for effectiveness in the spring and summer of 2012. All installed waterbars were found to be operating effectively. There were no signs of water running along the surface of the road and no evidence of rill erosion.

Culvert removal

Forest Roads 2411B, 2627, and 2481D had culverts removed as part of road storage activities. Removal was accomplished in 2011 and 2012 with monitoring generally occurring one year post implementation.

Forest Road 2411B had a total of 12 culverts removed, with two being of greatest concern. These were the Clark Creek crossings which were category 2 stream restorations. The crossings were mulched, seeded and had one grade control structure installed. The upper site experienced minor slumping of the banks of Clark Creek. In the future it would be better to have a stream width greater than 4 feet, but given the significant spring runoff, it handled it well.

Forest Road 2627 had five culverts blasted and one removed with machinery due to culvert depth. Post removal, all resulting drains are functioning properly. No grass seed or mulch was applied to these sites. There was slight slumping in the Clark Creek site due to over-steepened banks but it was minimal and is equilibrating.

On Forest Road 2481D all culverts were removed. There were several instances of minor headcutting in the drains where culverts were removed. The observed headcutting was less than a foot deep but was causing some instability of the banks. While this is not desirable, it is normal as the channels are finding their new equilibrium.

Some roads received full contouring for the first several hundred feet to discourage vehicle use. In other cases natural restrictions such as the brushed in condition of roads was used. Forest Road 2499B was restricted through signage, and at the time of monitoring the closure had been violated several times. In all other cases the road decommissioning or storage has been effective.

Proper Function Condition Assessments

A series of assessments was completed for the Bottom Canyon Project Area in 2013. Five stream reaches were surveyed, which included Canyon Creek (lower floodplain), Canyon Fork (mid-channel), Burnt Cabin Creek (lower), Bottom Creek (lower), and Nicolas Creek (mid-watershed). The condition of four reaches was determined to be Functioning at Risk. These included Canyon Creek, Canyon Fork, Burnt Cabin Creek, and Bottom Creek. Nicolas Creek was the only reach rated and assessed with a condition of Properly Functioning. Canyon and Burnt Cabin Creeks were both determined to be trending upward, while Canyon Fork and Bottom Creek were determined to be trending downward.

The Canyon Creek reach was found to be lacking in sinuosity and large woody debris (including the potential recruitment of it). Burnt Cabin Creek was constrained between the road and hillslope through the assessed reach. The channel contained many old structures that controlled the vertical and lateral migration of the stream. In this area, the road runs through the center of the floodplain.

Canyon Fork is an entrenched channel with sections that cannot access the floodplain, which appears to have been altered. Many fry (baby fish) were found but no evidence of larger fish. The Bottom Canyon reach showed vertical instability upstream of the culvert. There was also a lack of large woody debris recruitment. There are numerous channels throughout with vertical banks and excessive sediment and/or bedload deposits. The adjacent road has been recontoured.

Nicolas Creek is boulder dominated with short sections of functioning properly type channel. There are small wood dams, vegetated point bars, and migration (both vertically and laterally within a small floodplain). In addition, there is also diversity of bedload, riparian vegetation, velocity, habitat, and lots of wood.

Implementation Monitoring

Four instances of implementation monitoring were conducted on active logging operations. The first instance was on the Blazing Saddle timber sale. Two instances came from the East Fork Stew timber sale. And the final instance is from the Lakeview Reeder timber sale.

Blazing Saddle Timber Sale

Unit 8 of the Blazing Saddle timber sale was monitored on September 7, 2012. This unit was tractor yarded and was approximately 50 percent complete at the time of the visit. Skid trails were found to be properly laid out with approximately 100 foot spacing. They were on suitable ground as well. Adequate slash mats were in place and being utilized by the skidders. The log landing was located within the Riparian Habitat Conservation Area of a small perennial stream at the bottom of the unit. The location was necessary due to a lack of other suitable options. The area was inspected by a hydrologist and found to have no sediment delivery or other direct impact to the stream channel. The logger had effectively used log stacks along the edge of the landing to prevent material from moving toward the stream.

East Fork Stew Stewardship Timber Sale

The East Fork Stew Stewardship sale was monitored on two separate occasions to evaluate the implementation of BMP's. The first time was on January 11, 2013, when monitoring of roads and units 1 and 17 were evaluated. At the time of monitoring the Forest Service road from U.S. 95 to the landing had been plowed. The road surface was intact as an ice lens had been left on the road. No road surfacing material had been side cast into streams. Drains in the berms had been installed where feasible. The logger was working in unit 1 and all BMP's and design features appeared to be adequate and functioning at the time of monitoring. The Riparian Habitat Conservation Area was inspected in units 1 and 17. It was located appropriately with painted boundaries, logging machinery had not encroached upon the boundary, and the landing was located outside the boundary of the RHCAs. The units were mandatory winter logging per design features included in the environmental analysis. Winter conditions, including frozen soils and adequate snow accumulations, existed throughout the units. The skid trails were located at adequate spacing and appropriate terrain thru the units. No sources of erosion or sediment delivery were observed.

The second monitoring of East Fork Stew stewardship sale occurred on May 22, 2013, for the purpose of evaluating roads. Forest Road 2499 (from the junction with Forest Road 2499A for approximately one half mile) was to be reconditioned with the timber sale. Reconditioning was started in the fall of 2012 but was suspended when the weather turned and conditions for the work were no longer favorable. The road had a large boulder barrier put in place following construction to prevent use. Large, adequately spaced water bars also were installed along the entire length of the road and were found to be functioning properly. Straw bales and wattles were installed above Meadow Creek to keep surface erosion from above the culvert from entering the stream.

Forest Road 2499B (from the junction with Forest Road 2499A to the end) was new construction and was completed in the fall of 2012. The road bed was well compacted and firm. It had been bladed in the spring of 2013 to remove ruts. At the time of monitoring the road was barriered with 'soft roadbed' signage. The closure had been violated by several vehicles with minor damage. This violation was reported to law enforcement. There were several areas with water running on the surface of the road for short distances. In addition there were several areas where excess ditch line water was causing ditch line erosion. The hydrologist investigated several of the sediment plumes from ditch relief culverts and found that none reached live streams, and none exceeded 40 feet in length. It is expected that erosion will attenuate when ditches become armored and when vegetation becomes established. However, the Forest Service engineers staked locations for extra culverts and ditch repair. It is noted that the new road location in conjunction with the reroute/decommissioned segment has much less sediment input into Meadow Creek than the previous configuration.

Forest Road 2499A (from the junction to the new construction spur) was reconstructed in 2010. It received gravel resurfacing and additional drainage, which was working well. No problems were noted. The newly construction spur has a boulder and stump barrier that appeared to be effective.

Lakeview Reeder Timber Sale

The Riparian Habitat Conservation Area boundaries of Unit 20 in the Lakeview Reeder sale were evaluated on October 21, 2013. The sale administrator requested that the hydrologist evaluate the unit's Riparian Habitat Conservation Area boundaries. The stream on the eastern most edge appeared to be a perennial non-fish bearing stream. The stream that divides the unit was an ephemeral stream. The lower portion of the unit is concave and wet. The marked buffer for the perennial stream was about 35 feet, not the normally accepted 150 feet. The marked buffer on the ephemeral stream was about 25 feet and not the

recommended 75 feet. The marking was done in such a manner that the timber haul route would be within the 150 foot Riparian Habitat Conservation Area buffer. It would be through a 30 foot wide corridor between the two streams. This would result in considerable soil displacement. After the unit was reviewed the boundary was changed to avoid the narrow wet draw and create sufficient Riparian Habitat Conservation Area boundaries.

Forest Plan Monitoring Item G-3: Fish Habitat Trends

The following was adapted from Archer and Ojala, 2015[7].

Background

Salmon, steelhead, and bull trout stocks have been listed under the Endangered Species Act in most drainages within the interior Columbia River Basin. While many environmental factors led to the listing of these populations, habitat degradation is one of the major causes (Williams et al. 1999). Good or improving stream habitat, and protection of processes that maintain these habitats, increases the likelihood of successful adult spawning and juvenile rearing for these listed species. A useful approach for assessing the status of stream habitat condition at a given stream reach is to compare its habitat characteristics to those of streams likely to be functioning properly (Stoddard et al. 2006). The Pacfish/Infish Biological Opinion Effectiveness Monitoring Program (PIBO) uses this approach to evaluate status of stream habitat within portions of the interior Columbia River and Missouri River basins, and to also document changes in habitat conditions (e.g. "trend") over the current thirteen year period of PIBO sampling (2001-2013).

Methods

Determining the condition or status of an individual stream reach, or group of stream reaches is a difficult task because of the natural inherent variability in stream conditions due to geoclimatic and disturbance regimes (Ebersole et al. 1997). PIBO's approach is to compare the status of stream habitat conditions at sites in 'managed' watersheds (watersheds exposed to disturbance from various management actions) to habitat conditions at sites within 'reference', or relatively pristine, watersheds, which are used as a benchmark of expected condition. Because all streams are affected by natural disturbance, in assessing status we are most interested in how the range of stream habitat conditions expressed at managed sites compares to what would be expected if the stream had experienced only natural disturbance. To ascertain the status of a given site an index of habitat condition was created which accounts for some natural variability among sites and combines several stream habitat attributes (Al-Chokhachy et al. 2010). While an index is good for determining status, it may be less sensitive when detecting trend in habitat condition over time because it averages conditions of several attributes that may be more individually responsive. Therefore trends are estimated by measuring changes in individual stream habitat metrics, such as bank stability or large wood frequency, at a site over the duration of PIBO sampling (2001-2013).

Reach sampling

PIBO began collecting physical stream habitat and macroinvertebrate data at the reach scale (160-400 m stream lengths) within the interior Columbia River and Upper Missouri River basin in 2001. Approximately 300 sub-watersheds (6th field HUCs) are selected each year for sampling, using a random, nearly regular pattern. Over a five year period, 1,300 sub-watersheds are sampled in the Columbia River basin and 250 sub-watersheds in the Missouri basin, which equates to about a third of the sub-watersheds managed by the Bureau of Land Management and the Forest Service within the study area. These sub-watersheds have been resampled on a five year rotation, and the data are used to assess status and trend of aquatic and riparian conditions. PIBO is in the third rotation of the five year panel and by 2015, most sites will have been sampled three times.

[7] Archer, Eric K and J.V. Ojala. 2015. Stream Habitat Condition for Sites in the Panhandle N. F. PacFish / InFish Biological Opinion (PIBO) Monitoring Program USDA Forest Service, Logan, UT – Aug. 2015.

Sub-watershed and Reach Types

The sub-watersheds are divided into two groups, either "reference" (minimally managed) or "managed", based on management history (such as livestock grazing, mining, or roads). Reference sites are primarily located in wilderness areas or in watersheds with no obvious mining, no recent grazing (within 30 years), minimal timber harvest (< 5%) and minimal road density (< 0.5 km/km2). There are 254 reference sites within the study area (Figure 1).

Within each reference and managed sub-watershed, PIBO randomly selects an 'integrator' site located at the lowermost, low-gradient (< 3%), reach occurring on federal land. These low-gradient sites are influenced by the watershed upstream and are considered the most sensitive to changes from variable sediment and flow regimes. Integrator reaches are evaluated on a 5-year rotating panel with revisits occurring 5 years after the initial visit.

In addition to integrator sites, PIBO samples two additional site types. The first, called 'designated monitoring areas' or DMAs, occurs within grazed sub-watersheds at sites representative of grazing impacts typical for the pasture. The second type are sites on public lands upon special request of individual National Forests, BLM units, and National Parks.

Pay attention to scale

PIBO status and trend data are useful at the planning area scale or in broader contexts, such as sub-basin, basin, or ecoregion. However, to interpret status or trend with confidence, a sufficient number of monitored managed sites must occur in the area of interest at those scales. As reach sample size drops below ~ 10, caution is needed when interpreting the data, as statistical confidence in both the distributions and individual values is not as great. Non-significant differences between managed and reference sites at low sample sizes do not necessarily mean that management had no effect.

However, even at a single site, PIBO status and trend data can be helpful. For instance, if habitat condition scores at a site are on the lower end of the range of that observed at references sites, this could suggest that more conservative management or additional restoration activities are needed to maintain or improve habitat conditions. PIBO data also can be integrated with monitoring information collected locally to better inform project decisions.

Ground-truthing

PIBO data and analyses indicate status or trends of stream habitat attributes, but not necessarily their causes. Field visits or local knowledge are essential to assess possible reasons for poor habitat conditions and the nature of on-the-ground impacts to a specific site. For example, poor habitat conditions could be due to natural factors such as erosive soils or recent fires, as well as management such as roads or grazing. Field visits can also be used to verify how well the index scores reflect actual habitat conditions. Some error surrounds individual index score estimates because the models cannot incorporate all environment factors. In addition, our landscape predictors are GIS-derived, which also involves some associated error.

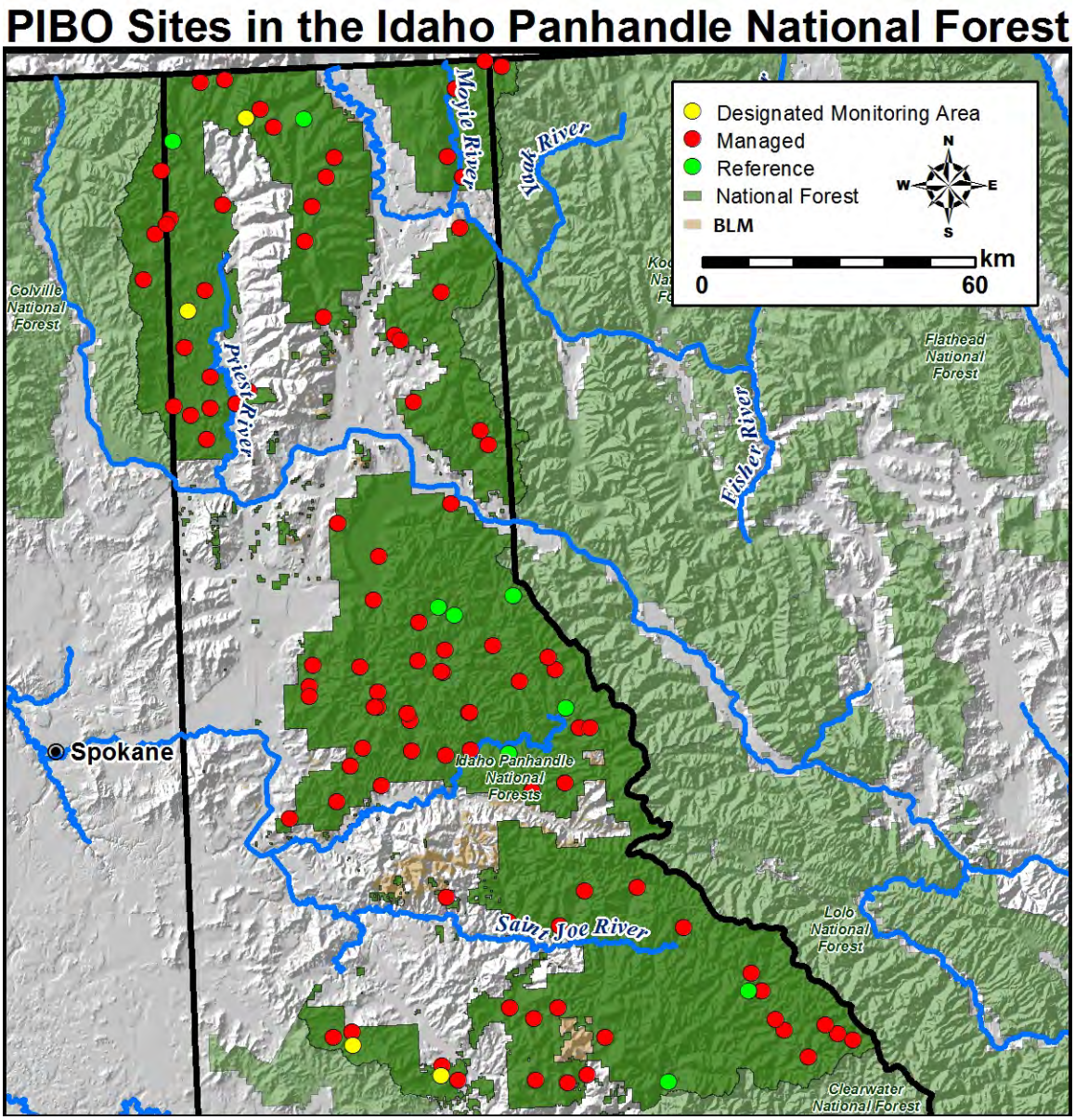

Figure 1. Map of the study area.

Habitat Trend on the Idaho Panhandle

Based on PIBO monitoring, in general, habitat appears to be trending in the correct direction. Habitat variables that show a detectible change appear to moving in the correct direction, although it is still difficult to understand habitat trends for some of the other individual habitat metrics. Trend in stream habitat attributes across all of the Panhandle Subbasin is displayed in Table 37.

The following variables were used to evaluate trend at the forest-wide scale and individual subbasins displayed below.

Overall = Overall index score

O.E. = Observed/Expected macroinvertebrate score

VegStab = % bank stability. The number of covered stable, uncovered stable, and false bank measurements divided by the total number of measurements.

UnCutPct = % undercut banks. Number of transect locations with bank angles <90 degrees divided by the total number of transect bank measurements.

LWFrq = large wood frequency. Number of category 1 large wood pieces measured within the reach and then standardized to per kilometer. Category 1 criteria: length ≥1m, diameter ≥0.1m, some portion must be within the bankfull channel and below the bankfull elevation.

Bank Angle = Average of all bank angle measurements. Bank angles <45 degrees are summarized as 45 degrees.

PTFines6 = Percent fines < 6 mm in pool tails. Quantified using a 0.36m x 0.36m grid with 50 intersections. The grid is placed at 3 locations along each pool tail. The percentage of particles <2mm and <6mm is calculated for each grid, averaged for each pool, then averaged for all pools within the reach.

D50 = Median substrate size. Diameter of the 50th percentile particles. Typically more than 100 particles measured per reach. Bedrock and bank particles are measured but later excluded from the calculation. Sampling methods have changed. Presently, five particles are collected along each transect (2004-present). From 1998 - Present, measured particles were gathered within riffle habitat.

RPD = Residual pool depth. Average of the residual pool depth values for all pools in a reach. Residual pool depth is calculated for each qualifying pool by subtracting the pool tail depth from the max depth.

PoolPct = Percent pools. Sum of all qualifying pool lengths divided by the reach length.

Table 37. Forest-wide habitat trend based upon the PIBO monitoring site results

Metric	T1 Value	T2 Value	% Change	Sample Size	(-) Num.	(+) Num.	None Num.	P-value	Desired Direction	Actual Change
Overall	46.6	50.1	7.5	75	32	42	1	0.09	+	+
O.E.	0.9	0.9	-0.1	83	41	39	3	0.92	+	NS
VegStab	77.2	79.2	2.5	83	34	48	1	0.23	+	NS
UnCutPct	32.7	35.7	9.1	83	33	48	2	0.07	+	+
LWFrq	285.7	365.3	27.9	79	23	56	0	0	+	+
BankAngle	108.9	107.6	-1.2	83	42	32	9	0.44	-	NS
PTFines6	24.6	21.1	-14	80	50	28	2	0.02	-	-
D50	0.1	0.1	0	83	33	42	8	0.51	+	NS
RPD	0.4	0.4	8.4	83	31	52	0	0.04	+	+
PoolPct	41.3	40.5	-2	83	40	43	0	0.66	+	NS

*NS = change is not detectible or statistically significant.

T1 Value. = mean during first visit;

T2 Value = mean value for most recent visit;

% Change = Percent change in the mean values between the first and last visit;

Sample size = number of observations with repeat visits;

- Num. = Number of sites where actual measurement was lower on last visit;

+ Num. = Number of sites where actual measurement was higher in last visit;

None Num. = Number of sites where last visit and first visit values were equal;

P-value = Significance test;

Desired Direction = direction of change in the mean, which can be either + or -;

Actual Change = actual direction of change in the mean, which can be either + or - not statistically significant (NS).

Literature Cited

Al-Chokhachy, R, Roper, B.B. and E.A. Archer. 2010. Evaluating the status and trends of physical stream habitat in headwater streams within the Interior Columbia River and Upper Missouri River Basins using an index approach. Transaction of the American Fisheries Society 139:1041–1059.

Archer, Eric K and J.V. Ojala. 2015. Stream Habitat Condition for Sites in the Panhandle N. F. PacFish / InFish Biological Opinion (PIBO) Monitoring Program USDA Forest Service, Logan, UT – Aug. 2015.

Ebersole, Joseph L., William J. Liss, and Christopher A. Frissell. FORUM: Restoration of stream habitats in the western united states: restoration as reexpression of habitat capacity. Environmental Management 21.1 (1997): 1-14.

Stoddard, J. L., D. P. Larsen, C. P. Hawkins, R. K. Johnson, and R. H. Norris. 2006. Setting expectations for the ecological condition of streams: the concept of reference condition. Ecological Applications 16:1267–1276.

Williams, R. N., P.A, Bisson, D.L. Bottom, L.D. Calvin, C.C. Coutant, M.W. Erho, C.A. Frissell, J.A. Lichatowich, W.J. Liss, W.E. McConnaha, P.R. Mundy, J.A. Stanford, R. R. Whitney.1999. Return to the river: scientific issues in the restoration of salmonid fishes in the Columbia River. Fisheries 24(3): 10–19.

Forest Plan Monitoring Item G-4: Fish Population Trends

Annual surveys of a subset of streams on the Idaho panhandle National Forest (IPNF) are conducted in partnership with the Idaho Department of Fish and Game (IDFG). The primary focus of the surveys has been westslope cutthroat trout (*Oncorhynchus clarki lweisi*) and bull trout (*Salvelinus confluentus*). Some of these surveys are only conducted once, while others have been surveyed over multiple years in the same location (index streams). Surveys for bull trout have been focused in the Priest, Pend Oreille, and St. Joe basins. Extensive surveys for cutthroat trout have been constructed in the Coeur d'Alene basin. Population trends of these two species are analyzed to determine the current status of the species'. All data referenced for this monitoring item is summarized from the 2013 Idaho Department of Fish and Game, Fishery Management Annual Report, Panhandle Region.

Bull Trout Redd Counts

Bull trout redds were counted in headwater streams and selected tributaries within the Kootenai River, Lake Pend Oreille, Priest River, and St. Joe River drainages. Surveys were conducted during late September thru early October. Comparison of redd counts by core area to prior years was done to identify dramatic shifts in population trends and total redd counts were compared to the ten year averages. Based on current information, bull trout population trends appear to be variable across most of the Idaho Panhandle National Forests. Redd surveys detected a total of 889 redds, including; 781 in the Pend Oreille drainage, 53 in the Upper Priest Lake drainage, 44 in the St. Joe drainage, and 11 in the Kootenai River drainage. Redd count totals from 2013 represented both increases and declines relative to averages of count totals from the previous ten year period, but did not reflect dramatic shifts in count abundance in any core area.

Kootenai River Core Area

Surveys were completed on October 17, 2013 on tributary streams. There were 11 redds observed in three surveyed streams in the Idaho portion of the drainage. The remaining 69 were observed in Montana tributaries. Populations in the combined, Idaho and Montana, portion of the Kootenai River core area showed an increase (n=80) over the previous two years (n= 79 and 63), but still less than the previous ten year average of 137 redds.

Pend Oreille Core Area

Pend Oreille core area redd counts were completed between October 15 and 24, 2013. A total of 781 bull trout redds were counted among all surveyed streams. Six index streams, counted consistently since 1983, accounted for 355 of the total redds. Overall counts were below the previous ten year averages for total counts (n=804) and index counts (n=523). Stream conditions on Pend Oreille core area tributaries may have affected survey results. Surveyors noted on several streams that a high water event, pre-redd survey, may have impacted detection of redds. In these locations gravels appeared to have been recently mobilized and may have disrupted visible redds.

Priest Lake Core Area

Priest River core area redd counts were completed on September 27, 2013. There were 53 bull trout redds counted between seven surveyed streams in the core area. Overall counts increased from the previous year and were above the previous ten year average for combined counts of 28 redds. Establishment of a core index set of survey reaches for the Priest River core area was recommended in 2013 by Idaho Department

of Fish and Game personnel. Tributaries surveyed in 2013 represented a core group of streams in which bull trout redd surveys have been conducted frequently since 1993 and in which bull trout redds have been commonly observed. These streams have been recommended as index reaches for future surveys.

St. Joe Core Area

St Joe River core area redd counts were completed between September 17 and 25, 2013. There were 44 bull trout redds counted between eight surveyed streams in the core area. Consistently counted index streams accounted for 22 of the total number of redds counted. Index and total counts represented a decline from previous years and from the previous ten year average for index streams of 67 redds. The number of streams surveyed per year in the St Joe River core area has varied considerably over time. Interpretation of total count values should be done cautiously. Future efforts will be focused primarily on index streams utilizing a semi-annual count schedule.

Cutthroat Trout Surveys

In coordination with the Idaho Department of Fish and Game, cutthroat trout densities were monitored at established transects in the Coeur d'Alene and St. Joe river drainages as part of a long term data set to evaluate a variety of fishery management and habitat improvement efforts. Forty-four transects were surveyed in the Coeur d'Alene River and 35 in the St. Joe River. Densities of cutthroat trout (*Oncorhynchus clarki lewisi*) greater than 300 mm total length were 0.24 fish/100 m^2 in the Coeur d'Alene drainage and 0.68 fish/100 m^2 in the St. Joe drainage. This was consistent with a trend of improving densities of cutthroat trout over 300 mm during the last 15 years.

North Fork Coeur d'Alene River

A total of 1,217 cutthroat trout were observed in the Coeur d'Alene River transects. Densities of cutthroat trout in all size classes, on all transects, averaged 0.75 fish/100 m^2. Densities of all sizes of cutthroat trout were very similar to 2012 (Figure 2). Density of cutthroat over 300 mm averaged 0.24 fish/100 m^2, which is also nearly identical to that observed in 2012. Past researchers found that declines in the Coeur d'Alene River fishery were directly related to over harvest, habitat degradation, and toxic mine wastes. Efforts such as habitat improvements and fishing regulation changes have been on-going to try to mitigate these impacts. It appears as though these efforts are having the desired effect. Cutthroat trout densities in the national forest portion of the Coeur d'Alene River have greatly increased since we began our surveys in the early 1970s. Despite annual variability, we've continued to see an upward trend, particularly in the past two decades. Though changes in fishing regulations and angler behavior are undoubtedly a key factor, improvements in physical habitat and water quality along with favorable weather conditions have also contributed to the positive trend in trout densities.

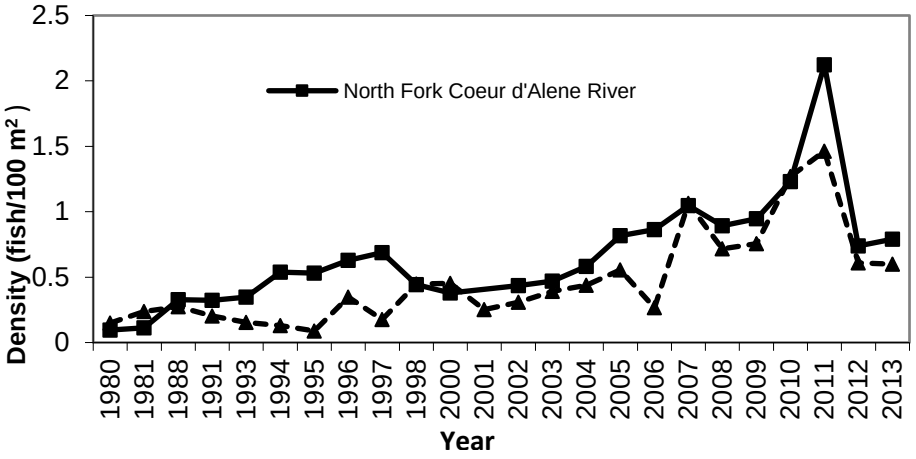

Figure 2. Densities of Cutthroat Trout of all sizes in the North Fork and Little North Fork of the Coeur d'Alene River, Idaho

St. Joe River

A total of 1,465 cutthroat trout were counted during the survey in the St. Joe River. Density of cutthroat trout over 300 mm averaged 0.68 fish/100 m^2. In the reach from the North Fork St. Joe to Ruby Creek, the density of cutthroat trout over 300 mm was 1.1 fish/100 m^2. This is the highest density of larger fish estimated since the surveys began in 1969. Total density of cutthroat trout of all sizes averaged 1.42 fish/100m^2. In the reach from the North Fork St. Joe to Ruby Creek, the density of all cutthroat trout was 2.3 fish/100 m^2, which is continuing an upward trend since 1998 (Figure 3). The St. Joe River has shown a pronounced increase in the abundance of cutthroat trout over 300 mm, particularly since 1997. The trend continued in 2013, with a nearly 40% increase in larger fish in that portion of the river upstream of the North Fork St. Joe. Density of all sizes of cutthroat trout also increased and were the highest ever recorded, with the exception of the anomalously high estimate in 1976 (Figure 3). Densities of rainbow trout in the St. Joe River remain low. The low abundance and decrease in distribution and population in the past 30 years suggests rainbow trout are not a significant threat to the cutthroat population in the St. Joe River.

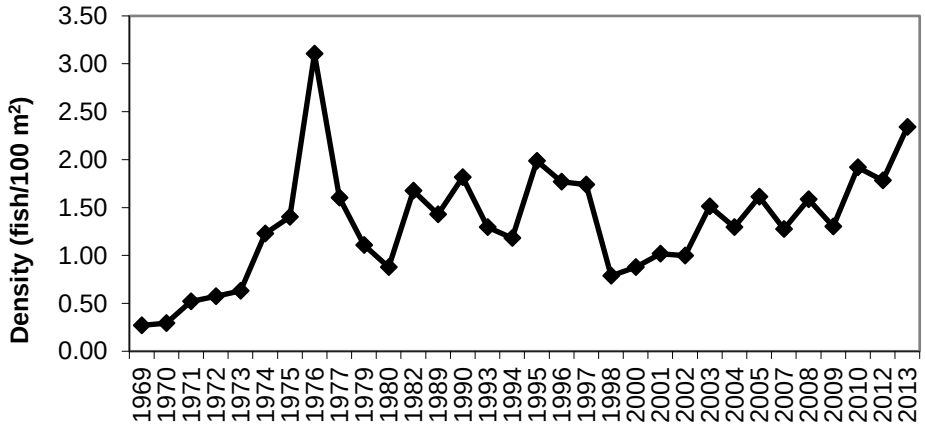

Figure 3. Densities of Cutthroat Trout of all sizes in the St. Joe River from the North Fork to Ruby Creek, Idaho.

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

The Idaho Panhandle National Forests' 1987 Forest Plan direction for sensitive and rare species, including plants, is to manage habitat to maintain population viability, to prevent the need for federal listing, and to determine the status and distribution of Threatened, Endangered, Region 1 Sensitive (TES), and other potentially rare plants.

Background

Threatened Species: Prior to 1998, only one threatened plant was listed for the Idaho Panhandle National Forests, *Howellia aquatilis* (water howellia). This species was historically (1892) known to occur within the Pend Oreille sub basin, near Spirit Lake, Idaho, on private land. Surveys conducted by Idaho Conservation Data Center (ICDC) botanists in 1988 failed to relocate this population. Existing populations are known for adjacent areas in eastern Washington, western Montana, and south in the headwaters of the Palouse River in north-central Idaho. Surveys of suitable habitat (vernal pools and isolated oxbows) across northern Idaho by USFS and ICDC botanists in subsequent years have failed to find additional populations. Surveys of suitable habitat on federal lands will continue following requirements found in the Endangered Species Act of 1973 and Forest Service policy. According to USFWS, water howellia is suspected to occur on the IPNF in Kootenai, Shoshone and Benewah Counties (USDI 2010).

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, 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. As a result, in 2004 USFWS 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 were 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 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, where these species are present. The IPNF currently addresses 44 Forest species of concern.

Survey Data

Surveys: During project planning, qualified botanists assess habitats for their suitability to support sensitive and rare plants. Habitat found to be suitable within project areas, and which would be affected by project-related activities, is surveyed to determine the presence of rare plant species. Protection measures are implemented to maintain population and species viability following the National Forest Management Act and Forest Service policy.

From 2012 through 2014, Forest botany personnel performed floristic surveys on 23,751 acres of suitable rare plant habitat in support of various projects, including timber, fuels reduction, watershed restoration, fisheries, recreation/trails, grazing, and special uses. Table 38 below displays survey acres by year.

Table 38. IPNF Rare Plant Botanical Survey Acres 2012 to 2014

IPNF Zone	2012	2013	2014	Total Survey Acres
North Zone	6,965	3,700	3,961	14,626
Central Zone	3,059	2,112	1,650	6,821
South Zone	440	660	1,204	2,304
IPNFs Total Acres	**10,464**	**6,472**	**6,815**	**23,751**

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 focused botanical or floristic 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 2014, botany personnel conducted 183,872 acres of floristic surveys on National Forest System lands with the express purpose of documenting and protecting rare plant populations from management activities and mitigating potential adverse effects. The acreage represents approximately 26 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 2010), 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. Table 39 below shows rare plant element occurrences reported by zone for fiscal years 2012 through 2014.

Table 39. New IPNFs Rare Plant Element Occurrences by Zone for 2012 to 2014

Species	Common name	Status	Number of Occurrences by Zone		
Botrychium lanceolatum	Triangle moonwort	Sensitive	5	5	
Botrychium minganense	Mingan moonwort	FSOC	6	2	2
Botrychium montanum	Mountain moonwort	Sensitive	4		
Botrychium pedunculosum	Stalked moonwort	Sensitive	2		
Botrychium pinnatum	Northwestern moonwort	Sensitive	3	4	
Buxbaumia viridis	Green bug-on-a-stick moss	Sensitive	2	1	
Cypripedium fasciculatum	Clustered lady's-slipper	Sensitive		1	3
Grindelia howellii	Howell's gumweed	FSOC			2
Lycopodium dendroideum	Ground pine	Sensitive	1		
Orobanche pinorum	Pine broomrape	FSOC	1	6	
Petasites sagittatus	Arrowleaf coltsfoot	FSOC	1		
Pinus albicaulis	Whitebark pine	Sensitive	11		
Rhizomnium nudum	Naked Mnium moss	Sensitive			1
Sanicula marilandica	Maryland sanicle	FSOC	1		
Thamniola subuliformis	Whiteworm lichen	FSOC		1	
Zone Element Occurrence Totals			**37**	**20**	**8**
IPNF Total New Element Occurrences 2012-2014			**65**		

North Zone Rare Plant Monitoring Data

Grass Creek and Cow Creek Monitoring

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

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 in the allotments and also as the grazing season ends in October.

Monitoring in 2004 revealed extensive cattle use of one plot, as well as the surrounding fen habitat. As a result, beginning in 2005, and every year since, a season-long exclusion fence has been erected around the rare plant population before the grazing season begins.

2012 Pre-Grazing Results: Due to late snowpack melt/run-off, pre-grazing monitoring was not performed until July 17, 2012; however, the depth of standing water in Cow Creek plots one and two was less than in 2010 or 2011. Cows were not allowed onto allotments until the third week in July.

Numerous rare plant species were observed within the allotment and monitoring transects, including whitebark pine (*Pinus albicaulis*), dwarf bog birch (*Betula pumila v. glandulosum*), poor sedge (*Carex magellanica ssp. irrigua*), bristle-stalked sedge (*Carex leptalea*), poor sedge (*Carex magellanica ssp. irrigua*), northern starflower (*Trientalis europaea*), and Hudson's bay bulrush (*Tricophorum alpinum*).

2012 Post-Grazing Results: Monitoring showed some cattle use and trampling within the Cow Creek fen habitats, including limited feeding, as well as trampling near monitoring plots. In particular, moderate to heavy cattle use was evidenced near plots one and two; however, only trampling was evidenced across the photo transect.

Within the Grass Creek allotment, plots two and three exhibited light to moderate trampling and "post-hole" damage of sphagnum mats within the transects due to cattle use. In addition, plot three showed evidence of moderate to high forage use by cattle; approximately 40-60 percent utilization of poor sedge (a sensitive species) was noted. Plot one within the Grass Creek allotment is within an exclosure fence to protect sensitive species, and a "fenceline" photo is shown below , dated 10/11/2012, to show utilization of all species is approximately 50 percent.

Figure 4. 2012 Post-grazing fence line contrast adjacent to Grass Creek, plot one

2013 Pre-Grazing Results: Pre-grazing results in 2013 were essentially the same as was documented in 2012. All the same sensitive species were observed. However, there was a greater amount of standing water observed in all Cow Creek and Grass Creek plots than had been observed in 2012.

2013 Post-Grazing Results: Only incidental use by cattle was observed within fen habitats. Most of that use was associated with the cattle accessing the streams. No cattle use or signs were observed in any Cow Creek plots, and no non-native, invasive species were observed on plots. Within Grass Creek allotments, no cattle use or trampling was observed within any plots.

2014 Pre-Grazing Results: Pre-grazing results in 2014 were essentially the same as was documented in 2012 and 2013. All the same sensitive species were observed. However, conditions were not as wet as had been evident in 2012 and 2013.

2014 Post-Grazing Results: Some cattle use (including both feeding/tramping) was observed within and adjacent to plots one and two in Cow Creek, as well as adjacent to the control plot in Smith Creek. Graminoid use adjacent to Cow Creek plot two was estimated at 25-35%. No cattle use or trampling was observed in Cow Creek plot three. Within the Grass Creek allotment, no cattle use was obvious across plot one (as the exclosure seemed to be effective). However, plot two incurred light trampling, and plot three incurred moderate trampling damage (including "posthole" hoofprint damage to sphagnum mats) and approximately 10-20% utilization across the plot. Figure 5 below illustrates post-grazing conditions at Grass Creek plot three in 2014.

Figure 5. Post-grazing Monitoring Grass Creek- Plot 3, October 2014 (Moderate trampling and 10-20% utilization of the plot area is evident)

Clustered Lady's-slipper (*Cypripedium fasciculatum*) Monitoring at Chloride Gulch

Cypripedium fasciculatum is a U.S. Fish and Wildlife Service Species of Concern and a Forest Service Region 1 sensitive species. The Idaho Department of Fish and Game Conservation Data Center lists the species as having a rank of G4S3S2. A Global rank of G4 indicates the species is not rare and is apparently secure on a range-wide basis, but with cause for long-term concern (usually more than 100 occurrences range-wide). A SRank of S3 indicates the species is rare or uncommon in Idaho but not imperiled (typically 21 to 100 occurrences statewide). A State Priority listing of S2 indicates the species is likely to be classified as Priority 1 (endangered of becoming extirpated from Idaho within the foreseeable future), if factors contributing to population decline or habitat degradation or loss continue (ICDC 2010).

In 2003, a large population of *Cypripedium fasciculatum* was discovered on National Forest System (NFS) land in the Chloride Gulch drainage of the Sandpoint Ranger District. This large population, of over 700 individuals, is scattered in several subpopulations within and adjacent to a then proposed timber harvest and fuel reduction project area. Although the proposed timber harvest and fuel reduction treatments which prompted this botanical find have been delayed, the District desired to initiate monitoring, both to obtain baseline data and also following any treatment to determine the species' response to overstory canopy removal (timber harvest) and prescribed burning activities (either spring or fall).

In June 2008, the IPNF North Zone botany program began a long-term monitoring project, in cooperation with volunteers from the Kinnikinnick Chapter of the Idaho Native Plant Society. Ten subpopulations would be monitored annually, for five consecutive years. The fifth year monitoring was completed in June 2012, so thereafter, monitoring will only occur every two to three years until project treatment activities occur. Three of the ten subpopulations will eventually become control plots, in which no treatment activities would occur.

Within each plot, all *C. fasciculatum* stems in each size class (< 40mm and > 40mm) were counted; the total number of flowering and fruiting stems in each plot were also recorded. Because it is possible for clusters of aerial stems to emerge from the same rhizome (Seevers and Lang 1998), aerial stems rather than genets (genetically distinct individuals) were counted. Provision was made for any undeveloped buds and capsules present; flower number would be estimated by counting floral bracts.

Cypripedium fasciculatum makes a bract that subtends each individual flower (Thorpe et al. 2007). Occasionally, a bract is made for a bud that does not fully mature, and these were called undeveloped buds in this study (Thorpe et al. 2007). Most of these undeveloped buds are so small that they either do not have a bract or the bract itself is so tiny that it would not be confused with a functional flower bract (Thorpe et al. 2007). Most undeveloped buds are small, translucent, whitish nubs at the center of the leaf axil (Thorpe et al. 2007). Sometimes they are larger and identifiable as flower buds, but one can usually tell by their lack of color, small size, and stage of development relative to other flowers in the population that they will not develop into mature flowers (Thorpe et al. 2007). Undeveloped buds can occur with or without functional flowers (Thorpe et al. 2007).

Litter depth and browsing were also noted. Litter depth was determined by inserting a ruler into the soil until the ruler reached firm resistance indicating the presence of mineral soil. The depth of insertion was recorded in millimeters. At most plots, five measurements of litter depth were made in random locations, and the average litter depth was recorded for each plot. The number of browsed plants was tallied for each plot.

All associated trees, shrubs, forbs, grasses, or other plants identified within each plot were documented. Finally, overstory tree and mid-story shrub canopy cover were recorded by ocular estimation. The ocular estimation of canopy cover was performed by the same individual on all plots. The following table summarizes the data obtained in 2012. A complete and detailed monitoring report for each year is available upon request.

The Chloride Gulch *C. fasciculatum* population continues to fluctuate, with some sub-populations increasing, while overall population size appears to be in a decline.

Table 40. Results of Clustered Lady's-slipper (*Cypripedium fasciculatum*) monitoring at Chloride Gulch, 2012.

Year	Total Number Stems	Veg <40 mm	Veg ≥ 40mm	Flower ≥ 40mm	Fruit ≥ 40mm	Total Flowers	Total Fruits	Average Flowers/ Flowering Stem	Average Fruits/ Flowering Stem	Browsed	Average Litter Depth (mm)	Average Overstory Tree Canopy Cover (%)	Average Shrub Canopy Cover (%)
2012	546	80 (14.7%)	151 (27.7%)	94 (17.2%)	221 (40.4%)	193	494	1.50	2.09	30	29.8	41	64

Central Zone Rare Plant Monitoring Data

In 2012, 2013, and 2014: Central Zone personnel conducted informal element occurrence monitoring on deerfern (*Blechnum spicant*), Bloom Peak Douglasia (*Douglasia conservatorum*), Mingan moonwort (*Botrychium minganense*). Lance-leaved moonwort (*B. lanceolatum*), Northwestern moonwort (*B. pinnatum*), stalked moonwort (*B. pedunculosum*), pine broomrape (*Orobanche pinorum*), and clustered lady's-slipper (*Cypripedium fasciculatum*).

South Zone Rare Plant Monitoring Data

Howell's gumweed (*Grindelia howelii*) monitoring at Lindstrom Peak

Monitoring plots located to the south of Lindstrom Peak were established in 1995 in order to evaluate the effects of recreation activities and invasive species encroachment on habitats that support the rare plant species Howell's gumweed (*Grindelia howellii*). Three plots were established; these constitute permanent monitoring transects designed to reflect overall site quality, population vigor, and habitat damage and are visited annually during flowering.

Table 41. Howell's gumweed monitoring plots

Plot 1	20 x 50 foot macro plot
Plot 2	10 x 100 foot macro plot
Plot 3	65 foot 7 inches x 3 ft. 3 in. (= 1 meter x 20 meter plot)

Table 42. Lindstrom Peak Howell's gumweed monitoring results, 2012 to 2014

	Year	Germinant/ juvenile	Non-flowering adults (NFADs)	Flowering adults (FADs)	Average flowers (per FAD)	Total plants
Plot 1	2012	268	44	16	8	328
	2013	–	–	–	–	–
	2014	248	125	30	11.3	403
Plot 2	2012	347	68	2	3	417
	2013	–	–	–	–	–
	2014	225	201	81	7	507
Plot 3	2012	0	0	1	# not recorded	1
	2013	–	–	–	–	–
	2014	0	1	0	NA	1

In 2012, approximately fifteen Howell's gumweed plants were observed to the right (outside) of transect. Plot 1 was moved in 2011 in order to encompass the shifting monitoring population. A significant increase in *Potentilla erecta* was observed in/ near Plot 2. In the case of Plot 3, where only one flowering individual was observed, three Howell's gumweed plants were noted near plot, along roadside. There was no monitoring of Howell's gumweed conducted in 2013.

Clustered Lady's slipper (*Cypripedium fasciculatum*) monitoring: Eagle Creek Trail (Unit 50)

Monitoring plots comprise two linear plots paralleling the old trail, which was re-routed to protect the occurrence of *Cypripedium fasciculatum*. Individual Clustered Lady's-slipper were also noted along existing the trail. Based upon monitoring results, the population appears to be maintaining its health and vigor.

Table 43. Eagle Creek Clustered Lady's-slipper monitoring results, 2012 to 2014*

	Year	Number plants non-flowering.	Percent plants non-flowering	# Flowers	Number of plants flowering	Percent of plants flowering*	Number of fruits set	Total plants
Plot 1	2012	23	43%	48	30	57%	0	53
	2013	30	63%	2	1	2%	14	48
	2014	28	57%	33	21	43%	25	49
Plot 2	2012	37	53%	97	33	47%	0	70
	2013	14	31%	25	19	42%	32	45
	2014	43	50%	80	43	50%	35	86

*Note: For 2013, the percentages for flowering plants excludes fruiting plants, whereas for 2012 and 2014, flowering and fruiting plants were not distinguished (i.e., number/ percentage of flowering plants includes fruiting plants)

Literature Cited

Cypripedium fasciculatum monitoring in southern Oregon - 2007 Progress Report. A Cooperative Challenge cost Share Project funded jointly by Institute for Applied Ecology, and Bureau of Land Management, Medford District. Medford, Oregon.

ICDC. 2011. Idaho Department of Fish and Game Conservation Data Center. Element occurrence records. Contained in an electronic database. Boise, Idaho.

Seevers, J. and Lang, F. 1998. Management Recommendations for Clustered Lady's-slipper Orchid. Bureau of Land Management. In: Thorpe, Andrea S.; Thomas N. Kaye and Karin Rohland. 2007.

Thorpe, Andrea S.; Thomas N. Kaye and Karin Rohland. 2007. *Cypripedium fasciculatum* monitoring in southern Oregon - 2007 Progress Report. A Cooperative Challenge cost Share Project funded jointly by Institute for Applied Ecology, and Bureau of Land Management, Medford District. Medford, Oregon.

USDI Fish and Wildlife Service. 2007. Candidate Notice of Review for slender moonwort (*Botrychium lineare*). Federal Register. December 6, 2007. Volume 72, Number 234.

USDI Fish and Wildlife Service. 2012. Species List for the Idaho Panhandle National Forests.

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.

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 2012, 2013, and 2014 there were 15, 15, and 17 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.) – five sites were addressed in 2012, three sites in 2013, and ten sites in 2014.

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 – 4,864 (2012), 5,184 (2013), and 5,186 (2014) (for 2012, 2013, and 2014 respectively, 4,849, 5,169, and 5,169 of these were 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 – 0 (2012), 0 (2013), and 1 (2014).

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 – 15 (2012), 15 (2013), and 17 (2014).

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 – 15 (2012), 15 (2013), and 17 (2014).

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

Forest Plan Monitoring Item J-1: Lands

Table 44. Land Ownership Adjustment

Year	Acres of Federal Land Disposed	Acres of Non-federal Land Acquired
1981	8,582	12,187
1982	2,960	5,728
1983	2,277	520
1984	3,718	3,126
1985	7,556	15,775
1986	8,044	9,815
1987	2,779	4,632
1988	3,097	3,164
1989	3,692	4,062
1990	2,376	3,281
1991	630	1,080
1992	0	10
1993	11,282	14,009
1994	294	370
1995	1,965	3,229
1996	35	40
1997	4,755	7,533
1998	3,728	2,077
1999	2,744	1,880
2000	1,350	1,920
2001	813	2,261
2002	1,143	1,798
2003	0	0
2004	1	0
2005	0	0
2006	0	0
2007	3	0
2008	3,065	406
2009	39	13
2010	35	160
2011	1	0
2012	0	0
2013	1,126	922
Total	**78,096**	**99,998**

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; and
- Areas that have been severely burned.

Definitions of what is considered detrimental impacts:

- Detrimental Compaction: More than 15 percent increase in bulk density over natural for volcanic ash surface soils. The compacted soil displays a massive or platy structure.
- Detrimental Displacement: Removal of the forest floor and one inch or more of the surface mineral soil over a 25 ft^2 or more area.
- Severely Burned: The soil surface is in a condition where most woody debris and the entire forest floor are consumed down to mineral soil. The soil surface may have experienced a change in color or structure 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:

- Dry sites: 7 to 14 tons per acre;
- Moist sites: 17 to 33 tons per acre ; and
- 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).

Monitoring data collected was analyzed and is reported here. A variety of information was collected for monitoring across the Forest. There is a mix of pre-harvest, post-harvest and skid trail decompaction.

Monitoring of Pre-Harvest Soil Conditions

Monitoring of pre-harvest soil conditions occurred for five timber sales during 2012 and 2013. These had a combined total of 205 units. The purpose of monitoring these units was to determine the existing conditions prior to harvest or treatment in order to evaluate the effects of proposed actions and ensure that they met the Forest Plan and Regional Soil Quality Standards. Figure 6 displays the results of this

monitoring. Eighty-six percent of the units had either no existing impacts or had very little (five percent or less). Roughly 12 percent had moderate existing detrimental impacts of six to ten percent. There was about 1.5 percent and 0.5 percent in the 11 to 15 and greater than 15 percent range, respectively.

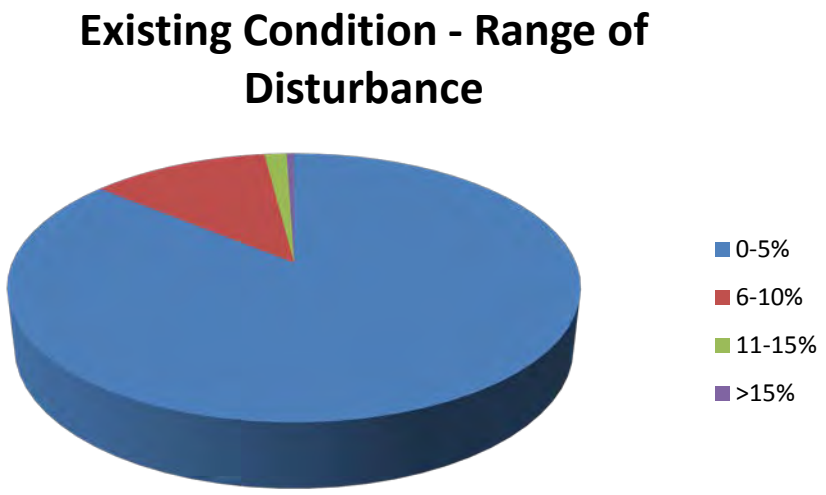

Figure 6. Range of Detrimental Existing Conditions

Those units that contain legacy impacts from past activities show that disturbances diminish with time. Within this monitoring period, there was one unit that contained greater than 15 percent detrimental impacts. Design criteria were provided to reduce any additional impacts that may occur from proposed activities. These criteria can include (individually or in combination), but are not limited to:

- Utilizing existing skid trails and landings where appropriate in order to maintain current soil compaction levels below the 15% requirement;
- Avoiding operation of equipment in areas such as moist or wet depressional areas;
- Limiting logging to times when soil 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;
- Restricting equipment operation to skid trails or where adequate slash matting exists;
- Operating when the ground is frozen to a depth of 4 inches;
- Consider 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 or requesting specific equipment combinations where applicable (i.e. utilize less impacting skyline; utilize in-woods processors and forwarders rather than feller bunchers, processors, and skidders); and

- Dropping a unit.

Recommendations related to soil productivity:

- Overwintering slash to recycle nutrients back into the soil;

- Ensuring that enough coarse woody debris will be left to sustain long term soil productivity following guidelines in Graham et al. (1994); and

- 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.

Table 45. Existing detrimental disturbance levels in 205 units on five timber sales on the IPNF

	Range of Disturbance			
Proposed Timber Sale	**0 - 5%**	**6 - 10%**	**11 - 15%**	**>15%**
Wooden Spur	30	3	1	0
Kreist Creek	42	0	0	0
Hellroaring Creek	39	1	0	0
Lower Priest	25	14	0	0
Twentymile Creek	40	7	2	1
Total Number of Units	**176**	**25**	**3**	**1**

Monitored levels of organic matter were highly variable in units, especially when viewed across the various proposed timber sale units, but generally ranged between low to optimal with some having higher values, especially in moist site habitats. Coarse woody debris was occasionally too low (<5 tons/acre) for several of the proposed timber sale units for existing conditions. These evaluations allowed for recommendations to be made to leave additional coarse woody debris after the harvest.

Monitoring of Post-Harvest Soil Conditions

Monitoring was conducted in three timber sales on five units. In all cases the units monitored met the Forest Plan and Regional Soil Quality Standards. Detrimental impacts ranged from nine to 13 percent in ground-based units, while both skyline units where at five percent. This is a bit higher than would typically be seen for skyline units on the IPNF, but is explained through the fuels treatments. One skyline unit was grapple piled, producing higher disturbance numbers than would typically be seen in a skyline unit with no ground-based machinery. The other monitored skyline unit was burned prior to monitoring. The numbers for this unit might have been much lower if more time had passed between the burn and the monitoring.

Table 46. Post-Harvest Monitoring

Timber Sale	Unit	Year Accomplished	Harvest Type	Fuels Rx	Detrimental Soil Impacts (%)	CWD (Tons/Ac)
Blue Alder	15a	2011	S	GP	5	5.3
East Fork Meadow	17	2012	GB/Winter	UB	10	NA*
	1	2012	GB/Winter		9	NA*
Borderline Stew	63	2010	S	UB	5	8.6
	125	2010	GB	GP/UB	13	11.7

*Monitoring of this was not completed because at the time of the monitoring visit the unit still had not been treated for fuels, though it was scheduled. S=skyline, GB=ground based, GP=grapple pile, UB= under burn

Though none of the monitored units exceeded the Forest Plan or Regional Soil Quality Standards, machine pivoting on slopes was observed to be a main cause for elevated disturbance levels in some units. Avoiding adverse skidding and turning of machinery, especially on steeper slopes, should be the goal for reducing impacts to soils.

The monitored units showed that the coarse woody debris amounts following the fuels treatments are consistently below the recommendations in Graham et al (1994). More material should be left in the unit when grapple piling is used. When units are broadcast burned, it would be helpful to choose a more moist burn window in order to have more remaining material after treatments.

Effectiveness Monitoring for Skid Trail Decompaction

A key monitoring item for the Blue Alder HFRA project was to collect and analyze data on the skid trail decompaction to help assess the effectiveness of such activities. Skid trail soils were sampled for bulk density prior to decompaction. At that time a control area was also sampled for bulk density. The control average was 0.86Db. This is a common bulk density for forested soils within northern Idaho. The average for the samples taken from the skid trail for Unit 50 was 1.19. Bulk density sampling for this project is ongoing and results are not yet available.

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

Northern Idaho forest ecosystems have undergone enormous changes in the last 150 years. In some cases, these changes have created needs and opportunities for restoration activities. Many of our forestland restoration needs are a result of problems that include large-scale reductions from historic levels of potentially long-lived, shade-intolerant, tree species, such as white pine, whitebark pine, western larch and ponderosa pine. These are the species best adapted to natural disturbances such as periodic drought and wildfire that are endemic to these ecosystems. If climate change leads to increased risks of drought and other stresses for forests, we might expect to see more forest disturbances from a variety of causes – including insects, pathogens, and wildfire. Ponderosa pine, larch, and white pine are the most disturbance-resilient tree species we have. However, compared to historic levels there is less forest area dominated by these species, and more forest dominated by shade-tolerant species such as grand fir and hemlock, which are more drought and fire sensitive. Besides these reductions in the shade intolerant, disturbance-adapted tree species dominating upper canopies, there are also large areas with forest understory dominated by shade-tolerant, moisture-demanding grand fir and hemlock.

Due to ongoing forest succession, reduced timber harvests, and fire suppression, we have declining a percent of the landscape with early successional shrub / seedling / sapling stages that provide important components of landscape level diversity. We also have less old growth forest than historic levels. However, the percent of old growth may be poised to increase over the next few decades because of the large amount of mature forest that is continuing to age. We are not removing old growth with timber harvest.

Whitebark pine declines from historic levels have been severe enough that the U.S. Fish and Wildlife Service now classifies it a candidate species for potential listing under the Endangered Species Act. Meanwhile, the Northern Region of the Forest Service now has it classified as a sensitive species. Where we have the opportunity, we are undertaking activities to restore whitebark pine.

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 following are some restoration actions that could be taken to improve the health of our ecosystems:

1) Maintain and increase old forest structures; manage stand densities; increase the proportion of white pine, larch, and ponderosa pine dominated forests; restore whitebark pine; increase patch size of older forest; increase variability in patch size of all forest ages classes; and manage fire to restore landscape-scale diversity of forest structure and species.

    a. To maintain and restore dry site old growth, active management may be needed that focuses on the following elements:

i. Retain the big old trees including some additional trees close to old growth age and size (especially ponderosa pine and larch – but also the older larger Douglas-fir);

ii. Reduce the dense ingrowth of smaller trees that can serve as live ladder fuels and that compete for moisture with the big older trees (especially moisture-demanding grand fir and large numbers of smaller Douglas-fir);

iii. Reduce excessive amounts of dead fuels while retaining moderate levels of large snags and large down logs;

iv. Provide opportunities for regeneration of shade-intolerant ponderosa pine and larch to provide future old growth cohorts.

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

3) Reduce fire, insect, and disease susceptibility through management of forest tree species composition, stand density, forest stand structure, and landscape patterns.

Idaho Panhandle National Forests Restoration Activities

The Idaho Panhandle National Forests has been working to address many of these restoration needs. Listed below are some restoration activities the Forest has carried out.

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

A total of approximately 3,262 acres were planted to these species in 2012 through 2014. (This includes the new, more blister rust resistant white pine.) The first three of these species tend to be best adapted to local climate, and most resilient to droughts, insects and root disease, and fire. Whitebark pine is a keystone component of high elevation forest that has suffered serious declines from historic levels due to blister rust, mountain pine beetle attack, and fire suppression.

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 is using tested, selected rust-resistant white pine trees in a multi-generational breeding program to accelerate the development of blister rust resistance in white pine, and to provide rust-resistant white pine seedlings for planting.

- In 2012 through 2014 combined, the IPNF planted approximately 257,630 blister rust-resistant white pine seedlings.

- From 1992 through 2014 the forest planted over 13,513,000 rust resistant white pine seedlings.

The second part of our strategy involves maintaining white pine as a forest component while they grow and mature. Where we do management activities we are retaining a landscape-wide, naturally breeding, and genetically diverse population of wild white pine that can develop blister rust resistance through natural selection. We have cooperated with the U.S. Forest Service, Northern Region, Forest Health

Protection Staff in publishing White Pine Leave Tree Guidelines (Schwandt and Zack, Forest Health Protection Report 96-3. March 1996). Since the publication of these guidelines, we have also included the pruning of the lower branches of young white pine trees. The lower branches of white pine are where potentially lethal infections of blister rust are most likely to occur. This practice reduces blister rust mortality where implemented; thereby increasing the likelihood that more white pine will be maintained during forest development to contribute to future genetic diversity.

- In 2012 through 2014 combined the Idaho Panhandle National Forests pruned white pine saplings on approximately 5,784 acres.

- From fiscal year 1992 through 2014, the Forest has pruned a total of 52,773 acres of white pine.

The implementation of the leave tree guidelines in conjunction with white pine blister rust pruning, and planting rust-resistant seedlings ensures that even where we are harvesting trees, we will maintain a naturally breeding white pine population to capture blister rust resistant genes from both the planted and wild populations.

3) Managing tree stocking and forest structure

- In 2012 through 2014 combined the IPNF pre-commercially thinned or released from competition 5,132 acres of young stands. Most of the thinning and release was to allow young – mostly sapling sized, shade-intolerant larch, white pine, and ponderosa pine – to maintain stand dominance, or to reduce density in over-crowded young stands.

- From fiscal year 1992-2014, the IPNF has thinned or released a total of 100,833 acres of young trees.

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

- There were 7,192 acres of harvest related natural fuel reduction accomplished fiscal years 2012 - 2014.

- There were 10,410 acres of natural fuel reduction accomplished in fiscal years 2012 - 2014.

5) Watershed Improvement

- 3,209 acres of watershed improvement were accomplished in fiscal years 2012 - 2014.

- From fiscal year 1992 to 2014 there were 15,331 acres of watershed improvement accomplished.

6) Road decommissioning

- There were about 128 miles of road decommissioned in fiscal years 2012 - 2014 as part of ecosystem restoration work, using a variety of funds.

- The following table shows that there were 1,744 miles of road decommissioning on the Idaho Panhandle National Forests from fiscal year 1991 to 2014. Classified roads are generally the ones that are inventoried, maintained and managed by the forest. The unclassified roads are not.

Table 47. 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	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
2007	3.4	0	3.4
2008	18.3	2.8	21.1
2009	49.2	11.7	60.9
2010	17.5	8.5	26
2011	19.1	18.7	37.8
2012	17.1	0	17.1
2013	31.2	0	31.2
2014	5.8	74.4	80.2
Total	**1,260.7**	**483.5**	**1,744.2**

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, and grizzly bear.

- 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 10.b says the Forest shall: "Maintain at least 10% of the forested portion of the IPNF as old growth". That Forest Plan identified 2,310,000 forested acres on the IPNF. Therefore, the Forest Plan requires maintaining at least 231,000 acres of old growth. Forest Plan Standard 10.a incorporates the definitions of old growth developed by the Regional Old Growth Task Force, documented in: *Green, and others. 1992 (errata corrected 12/11). 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 "Special Uses" field of the FSVeg-Spatial database.

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 (Forest Inventory and Analysis Program 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 all measurements are accurate, and 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 every 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 be impossible. 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[8].

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

[8] 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].

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 reasonably precise level for biological attributes that vary across the landscape. This confidence interval can be understood as indicating that if we did have a 100% census of every tree on every acre, there is a 90% probability that the true proportion of old growth for the population would be within this sample based confidence interval. For an approximately normally distributed population, there is a 5% probability that the proportion of old growth would be less than 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 IPNF. FIA plot data is tested against the old growth minimum criteria in Table 1 of *Green and others (2011)*. The old growth minimum criteria are the number of trees per acre that meet or 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).

Until 2004, FIA used what was characterized as a "periodic inventory". In the western U.S. periodic inventory, FIA plots in each state were remeasured in one large effort every 10 years. The last complete set of "periodic" FIA plots on the IPNF were installed during 2000 to 2004. Previous IPNF Monitoring Reports used FIA data from this "periodic inventory" to report on old growth on the IPNF. Old growth results from that periodic inventory were documented in 2006 and 2007 Northern Region reports *(Region One Vegetation Classification, Mapping, Inventory and Analysis Report #06-07 and Report #07-06, v1.2*).

Beginning in 2004, FIA switched to an "annual inventory" design, in which 10% of the FIA plots are remeasured in a spatially balanced manner every year. After 10 years, all the plots will have been remeasured. This annual inventory ensures that some of the data is updated each year, keeping the FIA dataset more current.

This monitoring report uses what has been characterized as a "hybrid" FIA dataset for old growth analysis. This "hybrid" dataset incorporates all the FIA annual plots remeasured in 2004 through 2007 plus any of the original periodic plots that had not yet been remeasured by the end of 2007. (It takes several years after the field measurements for FIA to compile and analyze plot data and release the results to the national forests.) IPNF old growth results from this hybrid inventory are documented in Region One Vegetation Classification, Mapping, Inventory and Analysis Report 13-5 v1.0, dated February 23, 2013, titled "Estimates of Old Growth on the Idaho Panhandle National Forest". This Region One report is the basis of FIA old growth findings used in this monitoring report. As it becomes available, additional FIA annual plots data will be used in future reports on IPNF old growth.

Based on FIA data, the estimated percent of old growth on the forested lands of the IPNF is 12.1%. The 90% confidence intervals of this estimate are 9.8% to 14.5%. Given these values, we conclude that the IPNF is meeting and exceeding Forest Plan Standard 10.b. that calls for maintaining "10% of the forested portion of the IPNF as old growth".

FIA old growth percentages by geographic area also provide evidence that 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, and as we look at smaller

geographic areas, the confidence intervals widen. Estimates of percentage old growth by IPNF geographic areas and associated 90% confidence intervals are as follows:

Table 48. 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	*6.9%*	**10.4%**	*14.7%*
St. Joe	*7.7%*	**12.0%**	*16.0%*
Sandpoint / Pend Oreille	*4.4%*	**9.8%**	*15.9%*
Bonners Ferry / Kootenai	*9.2%*	**15.2%**	*21.6%*
Priest Lake	*8.2%*	**14.2%**	*21.7%*
Total IPNF	***9.8%***	**12.1%**	***14.5%***

Old growth Estimates from IPNF Stand-Level Map of Allocated Old Growth

The IPNF stand-level old growth map is a management tool. This map represents a census of stands allocated for old growth retention to meet 1987 Forest Plan standards. The stand-level old growth allocation allows us to distribute old growth across Ranger Districts and landscapes in ways that make ecological sense at the landscape scale. This forest-wide stand map also provides a useful starting point when we are considering management activities that could potentially impact old growth, and where we therefore 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 old growth is allocated and well 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. Approximately 98.8% of old growth allocations are based upon field examination. Many old growth stands are examined with a formal systematic grid of stand exam plots that count and measure all designated sample trees on the plots. Allocation decisions for old growth stands utilize the field examination data, but usually also include landscape relationships in making old growth allocation decisions. 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. Only 1.2% of old growth stands are allocated based on photo inventory, and all of these 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 and field notes to assess how well individual stands meet the old growth definitions in the IPNF Forest Plan, utilizing criteria in *Green, and others (2011)*. The old growth definitions in *Green and others (2011)* are in two parts. First, there are tables of "Old Growth Type Characteristics". These tables include both "minimum criteria" (minimum age, minimum 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 (2011)* 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 (2011) 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 not part of the base old growth definition.

Speaking of the minimum criteria, *Green and others (2011)* further states:

> **"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 Green and others (2011). The purpose of this bold font was to emphasize the importance of what was being said). On pages 11 and 12, *Green and others (2011)* 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 table of "Northern Idaho Zone Old Growth Type Characteristics" in *Green, and others (2011)* 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 the same document. 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 natural events have changed the forest, and as new information has become available.

Starting in 2001 the IPNF did several years of substantial amounts of new field reviews and exams, to incorporate changes in conditions on the ground. Project-level stand examinations also provide ongoing updated information for those parts of the landscape we are actively managing. Ongoing additional exams and review, monitoring and updating of the old growth stand allocation and map results in some changes in the allocated old growth stand acres reported in annual monitoring reports over the years. These changes are 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 allocation information below was extracted from our database in early 2015, and reflects our best information at that time. Using this stand-level old growth allocation information together with the systematic FIA old growth estimates provides the most comprehensive picture of old growth amounts on the IPNF.

The IPNF does not do timber harvest or other management 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 approximately 550,000 acres of non-lodgepole mature forest (forests with the upper canopy 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.

It is useful to project what could possibly happen to future IPNF old growth percentages as these 550,000 acres of mature forests continue to age. In 2013 the Forest Service, Northern Regional Office did just such an analysis (*Future Old Growth Estimates for the Idaho Panhandle National Forest. Renate Bush; Brian Reyes. Region One Vegetation Classification, Mapping, Inventory and Analysis Report 13-7 v.1.1. April 23, 2013*). This report took the FIA plot data and estimated future old growth "by adding the number of years since inventory date to 2013 and in 10-year increments thereafter to tree ages and assessing if the plot meets the Green and others old growth criteria at each time." Using this methodology, the future old growth estimates for the IPNF (with 90% confidence intervals) are as follows:

Table 49. Future old growth estimates for the IPNF (with 90% confidence intervals)

Year	IPNF Estimated Percent Old Growth	Confidence Interval Lower Bound	Confidence Interval Upper Bound
2023	14.4%	12.0%	16.9%
2033	15.5%	13.0%	18.0%
2043	18.4%	15.8%	21.1%
2053	21.2%	18.4%	24.0%
2063	23.1%	20.3%	26.0%

On one hand, these future old growth estimates could be considered overly optimistic because some of these 550,000 acres of mature stands will undoubtedly be impacted strongly enough by insects, pathogens, wildfire, or possible timber harvest that they will fail to become old growth. On the other hand, one could argue that these future old growth estimates are overly conservative, because these estimates are based simply on progressed tree ages, but did not include any growth in tree diameters. Using this estimation methodology, trees too small in diameter and/or stands too low in basal area to currently meet old growth criteria could never become old growth. Realistically, over time trees will certainly continue to grow in diameter, which will also contribute to stand basal area. Because the projection did not include growth of tree diameters and basal area these future estimates contain an element that is overly conservative. Clearly, these future old growth estimates are not likely to exactly predict the future. But they do display the potential for old growth to increase on the IPNF in future decades.

The IPNF has allocated approximately 6,500 individual old growth stands distributed across 2.5 million acres of National Forest. It is not practical to visit every old growth stand every year. Because natural changes are going on continually (this includes both natural disturbances that remove some 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 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. Ten percent of the FIA plots are now re-measured every year. 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 stand old growth allocations within that project area.

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 aged and grown into old growth status, or because we also find previously un-inventoried old growth, this project-scale review often results in a net increase in old growth allocation in the project area.

We record old growth stand allocations in the Forest Service FSVeg-Spatial database, because there are database fields and codes designed for recording stand old growth status. FSVeg-Spatial is a national Forest Service database containing a wide variety of information, and used by national forests across the United States. A 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. The IPNF ranger districts devote substantial time and effort to maintaining and updating (when appropriate) the old growth stand information in our databases. For all potential management projects, FSVeg-Spatial old growth information is subject to additional project area review and validation 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 FSVeg-Spatial Database is ongoing as the forest continues to change and as 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 FSVeg-Spatial database contains codes indicating individual stand old growth allocation status. The formal stand examination data that's used in old growth determination is found in the FSVeg database; there may also be field notes and other information in the individual stand folders. This information is updated when new exams are done. Larger scale perspectives about landscape context are also used in making old growth allocation decisions.

The "Special Uses" field in the FSVeg-Spatial 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 contributes to old growth ecological functions, even though it is not formally allocated.

"Retained Existing Old Growth" (FSVeg-Spatial Special Uses code 9) meets (and often exceeds) *Green and others (2011)* 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 outstanding stands. “Ancient Cedar” stands contain trees over 5 feet in diameter, with estimated ages over 500 years old; they far exceed minimum old growth age and tree size criteria.

“Retained 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 at least one 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 watershed, and with some more time can be expected to meet the age criteria as well. Some “retained 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 “retained 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. Allocated retained 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 (2011)* 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 management can be monitored by tallying up acres of stands allocated and mapped as old growth in FSVeg-Spatial. 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 282,288 acres of forest stands (12.2% of IPNF forested acres) to be retained as old growth. This total includes Special Uses old growth codes 2, 9, 10, and 11. There are 236,560 acres of allocated, field-identified stands that fully meet old growth minimum criteria (codes 2 and 9). In addition there another 42,437 acres of code 11 (Retained Potential Old Growth) allocated using additional old growth considerations in *Green and others (2011)* and allocated to old growth management. Old growth status in 98.8% of old growth acres 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 5,659 acres (0.2% of forested acres) of previously field examined, unallocated old growth stands (code 12), which potentially provides additional old growth habitat for wildlife and serves other ecological functions.

Table 50. 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 Unallocated Field Verified Old Growth *(code 12)*	Total All Old Growth *(codes 2, 9, 10, 11, 12)*
St. Joe	1,963	58,645	703	13,687	**74,997**	5,552	**80,549**
Coeur d'Alene	207	53,147		12,123	**65,477**		**65,477**
Pend Oreille	53	19,728	266	5,841	**25,887**		**25,887**
Kootenai	516	59,394	111	8,341	**68,362**	107	**68,469**
Priest	2,138	40,770	2,211	2,445	**47,564**		**47,564**
Forest Total	**4,877**	**231,683**	**3,291**	**42,437**	**282,288**	**5,659**	**287,947**

Forest Plan Standard 10.i. 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 following table displays both those goals by management area, and acres we have currently allocated for old growth in those management areas. These old growth allocations meet and far exceed these forest plan management area goals.

Table 51. 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	100,125
2	6,000	24,334
3	400	1,677
4	4,000	14,778

Forest Plan Standard 10.e. 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 52. Old Growth Habitat Type Series Distribution

Habitat Type Series	Percent IPNF Acres by Inventoried Habitat Type Series	Allocated Old Growth Acres by Habitat Type Series	Percent of Allocated Old Growth Acres by Habitat Type Series
Ponderosa Pine	< 0.1%	0	0.0%
Douglas Fir	7.1%	9,808	3.5%
Grand Fir	14.5%	14,751	5.2%
Western Red Cedar	16.0%	52,891	18.7%
Western Hemlock	37.9%	110,004	39.0%
Subalpine Fir	15.0%	54,160	19.2%
Mountain Hemlock	9.5%	40,207	14,3%
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 more than 78% 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 22% 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 12 % 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 large high severity early 20th century fires; subsequent suppression of most low and mixed severity fires that served to maintain resilient old growth; late 19th and 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, the 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 the larger grand fir growing on upland grand fir habitat types are at risk from *Scolytus* bark beetles. If we want to increase the proportion of old growth on our dry habitat types and adjacent grand fir habitat types, active management will often be required to manage stand density and restore more resilient tree species (ponderosa pine and western larch).

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 short to medium interval mixed-severity fires that thinned out smaller trees; favored large trees of the most fire-resistant and drought tolerant species (ponderosa pine and western larch); and created a mosaic of stand conditions. These fires reduced the total number of smaller trees (thus limiting moisture stress to large trees on dry sites), and reduced both dead woody fuels and live ladder fuel accumulations (thus reducing the risk of stand-replacing crown fires), as well as creating small openings that limited fire spread. These low and mixed-severity fires were the keystone natural process maintaining dry site old growth forest structures.

Now, on dry habitat types, approximately 75 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 lower density stands. This higher moisture demand stresses the old 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 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 persistence of existing old growth on these dry sites, and reduces the chances of current younger stands surviving long enough to become old growth.

On 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, and may ultimately result in a decrease in existing

old growth. Active restoration by mimicking of historic disturbance processes may be necessary to meet the 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. Restoration treatments will maintain existing large old trees. 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 FSVeg-Spatial 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 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 12.1%. (90% confidence intervals of this estimate are 9.8% to 14.5%).

- The IPNF total acres of mapped stands allocated and retained for old growth is 12.2% 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.

Appendices

A. Forest Plan Monitoring Requirements

B. Programmatic Forest Plan Amendments

Appendix A. Forest Plan Monitoring Requirements

Table 53. Forest Plan Monitoring Requirements

Item Number	Standards, Practices, Activities, Outputs or Effects to be Monitored	Data Source	Frequency of Measurement	Reporting Period	Threshold to Initiate Further Action
A	All RESOURCE ACTIVITIES				
A-1	**Quantitative estimate of outputs and services**	Annual program accomplishment report	Annually	Annually	A trend established after 5 years that indicates less than 80% of Forest Plan goal has been accomplished
A-2	**Effects of other government agency activities on the national forests and the effects of National Forest Management on adjacent land and communities**	Other agency plans	Annually	Annually	When other agency programs affect attainment of Forest Plan Goals
B	TIMBER				
B-1	**Harvested lands restocked within 5 years**	Stand records	1,3,5 years	5 years	10% of harvest lands not adequately restocked 5 years following site preparation
B-2	**Timberland suitability**	Timber stand data base and forest data base, EAs	5 years	5 years	10% change in timberland currently classed as physically suitable
B-3	**Validate maximum size limits for harvest areas**	EAs	5 years	5 years	10% of openings exceed Forest Plan size limits
B-4	**Insect and disease hazard**	Insect and disease surveys	5 years	5 years	Insect and disease conditions are predicted to reach epidemic or serious levels on 5 % of the Forest
B-5	**Road construction**	Timber appraisals, construction contracts	Annually	5 years	Unit costs exceed estimates by 20% in two or more years
B-6	**Actual sell area and volume**	Cut and sold reports	Annually	5 years accumulation	Sell volume and acres less than 75% of FP goal

Item Number	Standards, Practices, Activities, Outputs or Effects to be Monitored	Data Source	Frequency of Measurement	Reporting Period	Threshold to Initiate Further Action
C	VISUAL RESOURCES				
C-1	**Meeting visual quality objectives**	EAs, field sampling	Ongoing	Annually	10% departure from Forest Plan direction after 5 years initiates further evaluation
D	RECREATION				
D-1	**Off-road vehicle effects**	Field evaluation, travel plan	Continuing	Annually	Conflicts with management area goals or between users
E	CULTURAL RESOURCES				
E-1	**Measure potential impacts of land disturbing projects on known cultural resources**	Field monitoring	Annually	Annually	Any unmitigated adverse impact
F	WILDLIFE				
F-1	**Population trends of management indicator species**	State Fish and Game Dept	Annually	5 years	Downward population trends
F-2	**Grizzly bear recovery objectives**	Idaho Fish and Game, USFWS	Annually	Annually	Not working toward recovery
F-3	**Caribou recovery objectives**	Idaho Fish and Game, USFWS	Annually	Annually	Not working toward recovery
G	WATER AND FISH				
G-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

Item Number	Standards, Practices, Activities, Outputs or Effects to be Monitored	Data Source	Frequency of Measurement	Reporting Period	Threshold to Initiate Further Action
					watershed system degrading due to lack of effectiveness of BMPs in use. 4 – Actual more than plus or minus 20% of model prediction
G-3	**Validate fish habitat trends**	Stream surveys	Annually	5 years	A declining trend in habitat quality
G-4	**Fish Population trends – cutthroat trout**	Cooperative with Idaho Fish and Game	2 years	2 years	Downward trend
H	THREATENED AND ENDANGERED PLANTS				
H-1	**Threatened and endangered plants**	Field observations incidental to project planning	Annually	Annually	Any plant 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 amended operating plan
J	LANDS				
J-1	**Land ownership adjustments**	EAs for land exchanges, land ownership records	Annually	5 years	Program is not contributing to Forest Plan goals. Less than 75% of program accomplishment.
K	ENVIRONMENTAL QUALITY				
K-1	**Prescriptions and effects on land productivity**	Field reviews	Annually	Annually	Non-compliance with BMPs or significant departure or effects significantly different than predicted

Appendix B. Forest Plan Programmatic Amendments

The Idaho Panhandle National Forests Forest Plan Record of Decision was signed in September 1987. Since then there have been a number of programmatic amendments to the plan. Programmatic amendments change Forest Plan direction for the duration of the Plan. These amendments can be based on a Forest-wide 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 IPNFs 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. In subsequent litigation, the U.S District Court for the District of Montana, on December 13, 2006, ordered that the 2002 FEIS/2004 ROD be set aside as contrary to law and that the matter be remanded to the Forest Service for preparation of a new environmental analysis that complied with 40 CFR 1502.22.

8) A 2005 amendment modified or removed from the forest plan certain objectives, standards and monitoring requirements pertaining to fry emergence (fish). Forest plan standards #1 and #2 for fisheries and monitoring requirement G-1 were removed in their entirety from the forest plan. The decision notice for this amendment was signed by the Deputy Forest Supervisor on June 2, 2005.

9) In 2007, the Regional Foresters for the Rocky Mountain, Intermountain and Northern Regions signed a record of decision to amend the forest plans on 18 national forests within those regions to incorporate management direction to conserve Canada lynx and its habitat. The amendment included the IPNF and was signed by the Regional Foresters on March 23, 2007.

10) In 2011, the Forest Supervisors of the Kootenai, Idaho Panhandle and Lolo National Forests re-signed the Record of Decision for the Forest Plan Amendments for Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones (see #7 above). The purpose of the amendment was to incorporate into the respective forest plans new wheeled motorized access standards within the Cabinet-Yaak and Selkirk recovery zones for Open Motorized Road Density, Total Motorized Road Density, and core area. The amendments also set linear miles of open and total road standards for areas outside the recovery zones that are experiencing recurring use by grizzly bears. The intent of the amendments was to reduce the potential for mortality and displacement of grizzly bears.